2015

The Genetic Architecture of Water-Use Efficiency Within and Between Two Natural Populations of Foxtail Pine

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THE GENETIC ARCHITECTURE OF WATER-USE EFFICIENCY WITHIN AND BETWEEN TWO NATURAL POPULATIONS OF FOXTAIL PINE

A thesis submitted in partial fulfillment of the requirements for the degree of Masters in Science at Virginia Commonwealth University

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April 30, 2015

Acknowledgement

Firstly I'd like to thank my advisor, Dr. Eckert, for all of his help and patience throughout the past two years. This thesis would not exist without his guidance. I would also like to thank Chris Friedline, without whom I would have been lost in the coding aspects of this project. Erin Hobson and Brandon Lind also have my thanks for their hard work which laid the foundation for this project before I even arrived at VCU.

To my family, thank you for your constant, unflagging support in all that I do. To my wonderful fiancé Nicole, thank you for always having faith in me and providing all the inspiration necessary to reach the finish line.

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Abstract

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The goal of this project was to determine the genetic architecture of water-use efficiency (WUE) for foxtail pine, which included genomic loci, and effect sizes of this trait. Foxtail pine is a subalpine endemic conifer that inhabits two distinct regional populations separated by 500 km in the mountains of California. In order to achieve this goal, a robust linkage map containing thousands of genetic markers was created using four megagametophyte arrays ranging in size from approximately 70 to 95 megagametophytes. Quantitative trait loci (QTL) discovered for WUE were mapped along the linkage map using linear mixed models and five half-sibling families grown in a common garden. Effect sizes of these QTL were tested for differences between the two regional populations of foxtail pine.

Introduction

The goal of this project is to determine the genetic architecture of a quantitative trait (water-use efficiency) and any differences in this architecture, in terms of SNPs, between the northern and southern populations of foxtail pine. First, it will be established whether or not precipitation is a predictor of the geographic distribution of foxtail pine using niche modeling, and whether or not this predictor varies significantly between the northern and southern populations. This will establish that traits responding to water availability are likely fitness-related within natural populations of foxtail pine. Next, it will be determined whether or not water-use efficiency is genetically controlled in foxtail pine, as well as whether or not this varies between the northern and southern populations. This will establish that water-use efficiency is a heritable trait in foxtail pine that is under the influence of natural selection. Finally, known genetic markers will be examined for correlation with water-use efficiency and determine whether or not this correlation varies between the northern and southern populations of foxtail pine. This should allow for the identification of genetic loci correlated with water-use efficiency, increasing knowledge of the trait's genetic architecture, as well as demonstrating any changes in the genetic architecture due to local adaptation of the two regional populations of foxtail pine. The creation of a robust linkage map for a novel subalpine conifer for the project will increase knowledge in the field of tree genetics. Furthermore,

mapping a quantitative trait like water-use efficiency to that linkage map will be useful for many future studies, including those interested in the genetic architecture of drought tolerance and increasing crop yield through marker-assisted selective breeding.

Fitness is a measure of the reproductive success of a particular individual or genotype. Fitness of an organism is typically measured relative to the population mean. Organisms with high relative fitness pass on their genetic material more frequently, thus increasing the chance that their particular alleles will fix in a population's gene pool. The most accurate and complete measure of fitness is an organism's total lifetime reproductive success, which incorporates both survivability and reproduction (Primack and Kang, 1989). However, this is often impractical, if not impossible, to measure. There are several components of fitness that are both indicative of total lifetime fitness and easier to measure. Examples include survival and fecundity over easily observed and crucial life history stages, such as early-life survival. For plants, certain traits such as high water-use efficiency can provide a significant fitness advantage for an organism by improving survivorship, which is a core fitness component (Heschel *et al.*, 2002). For example, high water-use efficiency would make a plant more likely to survive in a dry environment, or to survive a sudden drought. Fitness of successive generations of a species can increase over time through natural selection by fixation, or at least an increase in frequency, of alleles that positively affect fitness. An increase in the frequency of these particular, fitness-enhancing alleles can lead to populations becoming more fit in their particular habitat. This phenomenon is known as local adaptation. One of the most utilized experimental methods with which to demonstrate local adaptation is the common garden. In common garden experiments, organisms are

transplanted from their local environment to an alternate, experimentally controlled environment known as a common garden where the effects of the environmental change are observed (Langlet, 1971). Fitness has been shown to decrease in plants when they are transplanted from the local environment to which they are adapted and moved to a common garden in a different environment, providing evidence for local adaptation (Hiesey *et al.*, 1942).

When attempting to discern the possible genetic basis of a phenotypic trait, such as water-use efficiency, the underlying genetic architecture of that trait is the key to a complete understanding of the origin and maintenance of variation of that trait. Understanding the genetic architecture of a trait is multifaceted in that it requires the understanding of the many different properties of the trait; the amount and location of genes which effect the trait, the relative impact of each of these genes, as well as the contributions of epistatic, dominant and additive effects (Holland, 2007). Every gene involved in the expression of that trait must be identified, particularly those loci responsible for trait variation (Mackay, 2001). The effects of genotypic classes for all of the allelic states on the phenotype must be quantified for each and every gene comprising the genetic architecture. In addition, interactions among these genes, known as epistasis, as well as pleiotropy, which is the influence of a single gene on multiple phenotypes, must also be quantified (Mackay, 2001). Also important to the understanding of genetic architecture is the separation of the effects of genetic and environmental influences on the variation of a trait. It is critical to know how much variation in a trait is controlled by genetics, as opposed to environmental plasticity.

Through the use of QTL mapping techniques, much has been learned about the genetic architecture of many different complex traits in a wide variety of plant species (Holland, 2007). QTL mapping is therefore an ideal technique to use for investigating the genetic architecture of fitness-related traits, such as water-use efficiency. This project will utilize QTL mapping techniques to focus on locating and identifying genomic loci and genes that affect water-use efficiency, in a non-model, subalpine conifer.

Water-use efficiency is a fitness-related trait in plants which refers to the amount of water-used in a plant's metabolism relative to the amount lost through transpiration, and correlates to the ratio of carbon assimilation to transpiration (Chaves *et al*., 2004). Fitness-related traits are traits that have some measurable effect on the survivability or reproductive success of an organism (Eckert and Dyer, 2012). Water-use efficiency is a variable trait that influences how plants perform during fluctuating water regimes, including areas with little annual precipitation and soils with little water availability. Plants differentiate between the two carbon isotopes – ^{13}C and ^{12}C – during photosynthesis, preferring ^{12}C. This discrimination is highly correlated with water-use efficiency and can be used as a metric (O'Leary, 1988). This is because as water-use efficiency increases due to the closing of stomata, intercellular CO_2 concentrations decrease, leading to less discrimination between ^{13}C and ^{12}C (Cregg and Zhang, 2000). Theoretical and empirical studies have demonstrated that carbon isotope discrimination ($\delta^{13}C$) is highly correlated with plant water-use efficiency (Hubick, Farquhar and Shorter, 1986; Cregg and Zhang, 2000). ^{13}C content of plants is measured using a mass spectrometer designed to detect the ratio of $^{13}CO_2$ to $^{12}CO_2$; this ratio is converted to

$\delta^{13}C$ using a simple equation which compares the ratio of the sample to a ratio obtained from limestone (O'Leary, 1988). Lower values for $\delta^{13}C$ (i.e. less negative) correlate with higher water-use efficiency and higher $\delta^{13}C$ values (i.e. more negative) correlate with lower water-use efficiency (Chen *et al.*, 2011). Plants with lower $\delta^{13}C$ values, therefore, are likely to have greater water-use efficiency giving these plants a fitness advantage by enhancing the fitness component of survivability. There is significant variation in $\delta^{13}C$ discrimination among individuals in many different plant species, especially forest trees (e.g. Brendel *et al.*, 2002; Cumbie *et al.*, 2011). This variation in carbon discrimination can be studied and used as a proxy to determine how efficiently an individual plant could deal with drought. For long-lived plants, such as forest trees, one of the most important components of survivorship is that for early-life survival (Harper, 1977). This idea will be leveraged and measured $\delta^{13}C$ among five half-sibling families (n = 30-50 half-siblings per family) of foxtail pine seedlings (*Balfouriana* subsp. *balfouriana* & subsp. *austrina*) established within a common garden located at Placerville, California.

Linkage maps show the positions of known genes or gene markers based on patterns of segregation within a known cross, and display their position relative to one another in units of recombination distance. The concept of genetic linkage and the use of it to determine relative position and distance between genes have been in use since the advent of modern genetics. Linkage maps are extremely useful for increasing our understanding of the genetic architecture of many traits of interest. Linkage maps are constructed by estimating the recombination fractions among genes in order to determine their relative position to one another in an organism's genome (Ritter *et al.*,

1990). One of the goals of linkage mapping is to create a map with a high density of genetic markers. Such high density linkage maps facilitate the mapping of genes of interest to a specific locus, including fitness-related genes. Many tree species, including 25 species of conifers, have a linkage map constructed for their genome consisting of genetic markers including restriction fragment length polymorphisms (RFLPs), allozymes, random amplified polymorphic DNAs (RAPDs), and single nucleotide polymorphisms (SNPs) (Ritland *et al.,* 2011). Because carbon isotope discrimination is a genetically controlled trait in plants, the genes, or gene markers in close proximity to these genes, responsible for variation in carbon isotope discrimination are able to be plotted onto a linkage map. This project will utilize SNPs, discovered and genotyped using Restriction Site associated DNA sequencing (RADseq, Peterson *et al.*, 2012) to construct a high-density linkage map for foxtail pine. The dense linkage map for foxtail pine that will result from this project has potential to be useful as a tool for non-model conifer genomics.

One way to find variation that affects a quantitative trait is Quantitative Trait Locus mapping (QTL mapping). If a trait is determined genetically, then there are genomic regions that encode or regulate proteins that determine this trait. Variation at these genomic regions (e.g. SNPs) then creates variation at the trait. Heritability is the quantification of genetic variation, determined by differences at the level of DNA, in relation to trait variation. QTLs are sections of genome containing genes that affect a quantitative trait. Typically, quantitative traits are multifactorial or polygenic (Lynch and Walsh, 1998). QTL maps mark these regions of DNA to a specific area of the genome

and rely on the co-segregation between marker and trait variation for offspring within a pedigree. QTL mapping can reveal how many loci control a phenotypic trait, and where those loci can be found in the genome. QTL mapping utilizes molecular markers with known locations on a linkage map to locate the potential gene (or genes) responsible for a quantitative trait. QTL mapping has been used to combat pathogens by identifying disease resistance genes and gene loci in plants which could lead to the improvement of crop yields through marker-assisted selection (Collard *et al*., 2005; Leonards-Schippers *et al*., 1994). QTL mapping has also been used to identify genes and gene loci associated with carbon discrimination and water-use efficiency in major crop species (Xu *et al*., 2009). QTL mapping represents a first step towards an increased understanding of fitness-related quantitative traits such as water-use efficiency. Genetic markers identified through the use of QTL mapping could be used to survey natural populations of other plants like foxtail pine in order to help create management plans to conserve their populations during worsening droughts caused by global climate change. In this project water-use efficiency will be treated as a quantitative trait; its heritability will be established, and then a QTL map for this trait based on five half-sibling families of foxtail pine will be produced identifying genomic loci involved in the expression of this trait.

Foxtail pine is a subalpine conifer native to California with two distinct regional populations located in the northern Klamath Mountains (*Balfouriana* subsp. *balfouriana)* and the southern Sierra Nevada (*Austrina)* separated by approximately 500 kilometers (Eckert *et al*., 2008). The significant geographical distance between these two regional

populations means that they are evolving independently due to the lack of gene flow since their divergence approximately one million years ago (Eckert *et al*., 2008). The regional populations have demonstrated differences in morphology, chemistry and genetics (Eckert *et al*., 2008). The stands within each regional population experience different climate and soil regimes. The Klamath Mountain environment is dominated by serpentine and ultramafic soils (Burt *et al*., 2001). Mean monthly temperature in the Klamath Mountain varies between 4.4 and 15.6°C in January and approximately 21.1 to 32.3°C in July (Baker, 1944). The amount of precipitation in the mountains varies with elevation; lower elevations generally received greater amounts of rainfall, although large snow packs that last into the summer months develop at high elevations (Baker, 1944). The Klamath Mountains receive the most precipitation between the months of November and March, during which they receive 80% of their annual rainfall (Baker, 1944). The actual amount of precipitation varies from over 250 cm on the seaward slope to less than 50 cm on the eastern side (Baker, 1944), so that many of the local stands of foxtail pine are located in warm and relatively wet environments. In contrast, the southern Sierra Nevada has soil derived largely from granite (Cavelier *et al*., 1998). Annual average rainfall in the Sierra Nevada ranges between 25.4 and 76.2 cm, so the climate is relatively warm and dry with an average temperature of 22°C in the warmest month (Donley, 1979). Given the climatic and environmental differences between these two regional populations, significant difference in water-use efficiency between the two regional populations may have developed via local adaptation. If true, it is also possible that the two regional populations vary in their genetic architecture for the trait of water-

use efficiency due to the relatively independent evolutionary trajectory of these regional populations (e.g. lack of gene flow). Because environmental variation exists within regional populations and not just between them, it is also possible that local adaptation may have occurred among stands within the two regional populations. Ecological niche models attempt to assess the distribution of species in their environment based on climatic factors (McCormack *et al*., 2010). Ecological niche modeling will be used in this study to determine whether precipitation has an effect on two natural populations of foxtail pine.

There is great importance in understanding the genetic architecture of water-use efficiency in non-model plant species. Anomalous CO_2 concentrations in the atmosphere causes physiological changes to plant water-use efficiency, which is in turn believed to inhibit plant's ability to cope with climate change (Thuiller *et al*., 2005). There is an increasing mortality rate in trees due to longer, more frequent droughts caused by global climate change which threatens many species of plants (Breshears *et al*., 2008). Species facing extinction due to lack of water resulting from climate change could benefit from a greater understanding of the genetic architecture of water-use efficiency. The identification of QTLs tied to water-use efficiency could be extremely beneficial in efforts to use marker-assisted selective breeding to increase water-use efficiency in drought threatened species (Collard *et al*., 2005). Thus the survival of rare and endemic plant species whose limiting factor is water availability could depend on our understanding of water-use efficiency and its genetic architecture.

Chapter 1

Introduction

The first question this project attempted to address was whether precipitation and precipitation-related factors have a significant effect on the geographic distribution of foxtail pine. This was done using environmental niche modeling techniques, which utilize computer algorithms to analyze environmental data in order to predict species' distribution (McCormack *et al*., 2010). Environmental niche modeling, also known as species distribution modeling, uses available data on a species' environmental niche in order to predict the species' distribution in a geographic space. Data on a species' environmental niche is often climatic, such as temperature and precipitation values. Environmental niche modeling techniques and climate data such as precipitation and temperature are often utilized to predict species' distributions (Beerling, 1995; Huntley, 1995; Pearson, 2002; Pearson, 2003). Precipitation and precipitation related factors are important variables in the distribution of plant species (Phillips *et al*., 2006). For this project nineteen environmental variables, including annual precipitation and factors related to precipitation such as temperature, were analyzed by these niche models (Table 1) (Hijmans *et al*., 2005). Precipitation and precipitation-related factors were used in this assessment because this project is primarily concerned with water-use

efficiency, a fitness-related trait which is heavily influenced by water availability. Establishing that climatic variables influence the geographic range and distribution of subalpine conifers such as foxtail pine is important because it is a critical first step towards investigating whether or not water-use efficiency is genetically controlled and, ultimately, determining the genetic architecture of the trait.

Two regional populations of foxtail pine exist, *Balfouriana* subsp. *balfouriana* in the northern Klamath Mountains and *Austrina* 500 kilometers south in the Sierra Nevada (Eckert *et al*., 2008) (Figure 1). Understanding whether or not there is any significant difference in the effect of climatic variables on the distributions of the two foxtail pine populations is important in understanding the role of local adaptation in their evolutionary history.

Methods and Materials

In order to determine whether precipitation has an effect on the distribution of foxtail pine, niche modeling was performed. Niche modelling is the use of computer algorithms to predict species' geographic distribution based on climate data (Elith and Leathwick, 2009; McCormack *et al*., 2010). To create the niche model, the geographic coordinates of 306 foxtail pine occurrences were obtained from herbarium records for both the northern Klamath Mountain (*P. balfouriana* subsp. *balfouriana*) and the southern Sierra Nevada (*P*. *balfouriana* subsp. *austrina*) regions (Consortium of California Herbaria, 2014) (Appendix 1). Some of these coordinates were approximated via satellite images of the surrounding landscape. Furthermore, climatic data for

nineteen environmental variables related to precipitation were obtained for both regions from the Geographical Information System (GIS) to serve as environmental variables in the niche model (Hijmans *et al*., 2005).

Maxent, a software which uses the maximum-entropy approach for species distribution modeling, was used to create species distribution models for foxtail pine (Phillips, 2006). Maxent attempts to estimate a target probability distribution by finding the probability distribution of maximum entropy, or the most uniform probability distribution (Phillips *et al*., 2006). Probability distributions were defined as points on map of a geographic area, in this case California because it contains the entire geographic range of foxtail pine. Knowledge of the target probability distribution consisted of known climatic variables such as temperature and precipitation and known geographic occurrences of foxtail pine which were used as sample points. Maxent runs were performed using the known geographic occurrences of each regional population individually as well as using every known geographic occurrence of foxtail pine regardless of region. The probability distribution of maximum entropy was constrained because the expected value of each climatic variable should match its average value from the set of known occurrences taken from the target distribution (Phillips *et al*., 2006). Starting with the probability distribution of maximum entropy, Maxent performs multiple runs using a optimization procedure which tries many different paths to create species distribution models which attempt to maximize the probability of correctly predicting species occurrences based on available climatic information (Fridley, 2009). The fit of the model was assessed by comparing the predicted species distributions to

the observed species distributions. Maxent also calculates the relative importance of each environmental variable to each run's species distribution model as well as to the overall model in the form of percent contribution and permutation importance (Fridley, 2009).

Precipitation, temperature, and other precipitation related values obtained from GIS were input as environmental variables against the 306 geographic coordinates marking the known occurrences of foxtail pine from both regional populations. 19 environmental variables, all precipitation or precipitation-related data, were included in the niche model. The climatic data used in the models were available for the past, present and projected into the future. Climatic data from the present, 21,000 years ago and 120,000 years ago were used in this analysis in order to study the divergence of foxtail pine over time into two distinct regional populations and assess whether the generated models suggest that precipitation related factors contributed to the geographic divergence of the species. Using these data, Maxent generated models which projected the geographic ranges of *P. balfouriana* subsp. *balfouriana* and *P. balfouriana* subsp. *austrina* individually, as well as both regional populations at once.

In order to test whether or not there is a difference in the impact on distribution in the regional populations of foxtail pine due to precipitation or precipitation-related factors, two-sample t-tests of environmental variable contribution and permutation scores generated by Maxent were used to find any significant differences ($\alpha = 0.05$) in precipitation's predictive ability for geographic distribution of foxtail pine between the Klamath Mountain and Sierra Nevada populations. 100 runs were conducted in this

Maxent analysis; therefore 100 percent contribution and 100 permutation importance scores were generated for each of the nineteen environmental variables. Contribution scores reflect how much a particular environmental variable contributed to the niche model for a given path on a particular run (Phillips, 2006). Whereas the percent contribution varied depending on the path of a particular run, the permutation scores were dependent upon the complete model and thus are a better indicator of a variable's overall importance (Phillips, 2006). Bootstrapping (n=1000 replicates) with replacement across all of these known occurrences of foxtail pine within each regional population was used to test the null hypothesis that the relative importance of precipitation variables does not differ among regions.

The permutation and contribution scores for each of the 19 environmental variables were separated based on which population they pertained to; the Klamath Mountain population or the Sierra Nevada population. Two-sample student's t-tests were then used to determine if there was a significant difference in the regional population means for each environmental variable. For each environmental variable, the 100 contribution scores generated for the northern regional population of foxtail pine by the 100 runs of Maxent analysis were averaged and compared to the mean of the corresponding contribution scores for the same environmental variable for the southern regional population. In this way, it was determined whether or not there was a significant difference in the contribution scores of these nineteen climatic variables between regional populations. The two-sample t-tests that were conducted generated t-statistics, p-values, mean contribution and permutation scores for *P. balfouriana* subsp. *austrina*

and subsp. *balfouriana* populations, degrees of freedom and 95% confidence intervals for the difference between means of the contribution and permutation scores of the two regional populations of foxtail pine (Table 2, Table 3). A significant difference, indicated by a p-value less than 0.05, between the regional population means of contribution and permutation scores indicated a difference in the importance of that environmental variable in the model.

Mean contribution scores for each environmental variable were compared between the two regional populations to determine if there was a significant difference in the amount that each variable affected each regional population. Mean permutation scores for each environmental variable were compared between the two regional populations to determine if there was a significant difference. P-values were recorded as an indicator of significant difference in the mean scores. P-values that were less than 0.05 were considered to indicate a significant difference in the contribution score means. 95% confidence intervals, degrees of freedom, t-statistics and the means themselves were also recorded.

Results

Species distribution models were generated using the niche modeling software Maxent. These models predicted the geographic distribution of foxtail pine regional populations based on climate data and known geographic occurrences of the species at three time periods. The three time periods assessed were present day, 21,000 years ago and 120,000 years ago.

The geographic ranges of the Klamath Mountain and Sierra Nevada regional populations were predicted at all three time periods; present day, 21,000 years ago and 120,000 years ago (Figure 2). These predicted geographic ranges were compared to the actual geographic range of foxtail pine in the present day (Figure 1). The predicted ranges for both regions in the present day and 120,000 years ago are geographically similar to the actual present day range of foxtail pine. The species distributions predicted in Figure 2 does not exactly match the actual observed species distribution of *P. balfouriana* subsp. *balfouriana*; as expected the species distribution model shows a higher concentration of predicted trees in the northern part of California, however a large number of trees are predicted in the 500 kilometer gap between the two regional populations which is incorrect. The species distribution predicted for the Sierra Nevada regional population matches fairly well with the actual observed species distribution of *P. balfouriana* subsp. *austrina*, and as expected shows a higher concentration of trees in the southern part of California. However, the predicted range for foxtail pine regional populations 21,000 years ago varies from the actual present day range. AUC values and their standard deviations were calculated for both regions at each time period to assess the fit of the model (Appendices 2A, 3A, 4A). AUC values were utilized in order to evaluate the models and provide a summary of their performance. All AUC values averaged for each region at each time period were greater than 0.99 for both training and test samples (Table 4). This indicates that the models have high predictive power.

Percent contribution and permutation importance scores were calculated by Maxent in order to determine the relative importance of each environmental variable in

each time period (Appendices 2B, 2C, 3B, 3C, 4B, 4C). The p-values obtained from the t-tests on contribution and permutation scores were all statistically significant (<0.05) with the sole exception of the environmental variable BIO7, annual temperature range, which returned a p-value of 0.05647 for the difference between contribution scores of the two regional populations. This means that annual temperature range had the same relative contribution to the species distribution models for both regional populations. The other 18 environmental variables had a significantly different effect on the geographic distribution of the regional populations. Additionally, the p-values obtained from the t-tests on permutation scores were all statistically significant (<0.05). Therefore, all 19 environmental variables had significantly different permutation scores between the regional populations.

The relative sizes of contribution scores indicate the importance of a particular environmental variable to the model. BIO1 through BIO11 represent environmental variables having to do with temperature. BIO12 through BIO19 represent environmental variables having to do with precipitation. The average overall contribution score for temperature-related variables was 5.04. The average overall contribution score for precipitation-related variables was 5.57. The average overall permutation importance for temperature-related variables was 4.68. The average overall permutation importance for precipitation-related variables was 6.06. Based on these averages, precipitation-related variables contributed more to the species distribution models on average than temperature-related variables.

Conclusions and Discussion

The results support the alternative hypothesis that precipitation and precipitation-related factors have an impact on the geographic distribution of foxtail pine. The species distribution models generated by Maxent using climatic variables predict the known geographic distribution of foxtail pine with some accuracy, varying depending upon the methods used in their creation. The species distribution models for present day and 120,000 years ago matched actual present day foxtail pine ranges fairly well for both regional populations. This suggests that the values of environmental variables today are relatively similar to those 120,000 years ago for these regional populations. However, the predicted ranges for the regional populations of foxtail pine 21,000 years ago differed from the actual present day range. The northern regional population occupies a significantly larger amount of geographic space in its predicted range than it currently does. The southern regional population also has a slightly larger range than would be expected if environmental variables held constant through the time periods. This suggests that environmental variables were more slightly more favorable for foxtail pine 21,000 years ago, allowing their geographic range to expand for a time. These results support the conclusion that precipitation and precipitation related factors are predictive of geographic distribution in foxtail pine because the species distribution models generated using those factors were able to somewhat accurately predict the actual distribution of the two regional populations of foxtail pine.

The results also support the alternative hypothesis that the effects of precipitation and precipitation-related factors on the geographic distribution of foxtail pine differs

between the two regional populations. Using two-sample t-tests, the mean contribution scores for each environmental variable for each regional population were compared. With the exception of the environmental variable BIO7, for which there was no statistically significant difference, there was a significant variation (p-value < 0.05) between regional populations in the effect of precipitation on geographic distribution. Permutation scores were also significantly different between populations for every environmental variable. The most important variables for the northern regional population of foxtail pine were the mean temperature of the warmest quarter (contribution score 22.3, permutation importance 21.8), annual mean temperature (permutation importance 33.5), mean temperature of the coldest quarter (permutation importance 13.6), and precipitation of the coldest quarter (contribution score 43). The most important variables for the southern population of foxtail pine were the mean diurnal range (contribution score 13.2, permutation importance 21.6), max temperature of the warmest month (contribution score 44.3, permutation score), precipitation of the coldest quarter (contribution score 12.5), and precipitation seasonality (permutation importance 50.7). These contribution scores and permutation importances were significantly larger than average (the average contribution score was 5.31 and the average permutation importance was 5.37) and thus indicate substantial importance in determining the species distribution models for their respective regional populations. All were significantly larger in their respective regional population than in the other, indicating that these variables can have major influence over species distribution in one regional population but not necessarily the other. The precipitation of the coldest quarter

had a particularly large effect on both regional populations indicating that the amount of rainfall available cooler temperatures has a large amount of influence over the geographic distribution of foxtail pine, perhaps due to the trees' need to avoid winter desiccation. These results support the conclusion that the northern and southern populations of foxtail pine differ in their distributions as a result of precipitation and precipitation-related factors.

The implication of these results is that foxtail pine's geographic distribution is influenced, at least in part, by the climatic variables related to precipitation. Additionally, these results show that there is a difference in the way that the geographic distributions of the northern and southern populations of foxtail pine are affected by precipitation. With the importance of precipitation to the geographic distribution of foxtail pine established, the next chapter will address water-use efficiency, a trait which is closely tied to precipitation and water availability.

Figures and Tables

Table 1. The 19 environmental variables used in this project.

Variable	Definition
BIO1	Annual Mean Temperature
BIO2	Mean Diurnal Range (Mean of monthly (max temp - min temp))
BIO3	Isothermality (BIO2/BIO7) (*100)
BIO4	Temperature Seasonality (standard deviation * 100)
BIO5	Max Temperature of Warmest Month
BIO6	Min Temperature of Coldest Month
BIO7	Temperature Annual Range (BIO5 - BIO6)
BIO8	Mean Temperature of Wettest Quarter
BIO9	Mean Temperature of Driest Quarter
BIO10	Mean Temperature of Warmest Quarter
BIO11	Mean Temperature of Coldest Quarter
BIO12	Annual Precipitation
BIO13	Precipitation of Wettest Month
BIO14	Precipitation of Driest Month
BIO15	Precipitation Seasonality (Coefficient of Variation)
BIO16	Precipitation of Wettest Quarter
BIO17	Precipitation of Driest Quarter
BIO18	Precipitation of Warmest Quarter
BIO19	Precipitation of Coldest Quarter

Table 2. Results of t-tests for percent contributions of environmental variables

Variable	T-statistic	Degrees of Freedom	P-value	Mean for austrina	Mean for balifouriana	95% CI
Bio1	8.2065	126.488	2.24E-13	0.570384	2.240226	1.267178, 2.072506
Bio2	-45.6013	99.87	< 2.2E-16	13.163627	0.102927	-13.62894, -12.49246
Bio3	11.2356	190.03	< 2.2E-16	2.407081	4.578692	1.790361, 2.552861
Bio4	7.9189	99.008	3.58E-12	0.002556	0.939295	0.7020226, 1.1714554
Bio5	-143.8939	135.694	< 2.2E-16	44.317721	1.159948	-43.75091, -42.56464
Bio6	10.2948	195.106	< 2.2E-16	6.486787	9.252385	2.235786, 3.295410
Bio7	0.5774	132.067	0.5647	0.048925	0.066513	-0.04266935, 0.07784535
Bio8	-4.5885	121.621	1.09E-05	0.326652	0.066608	-0.3722367, -0.1478513
Bio9	7.1522	99.448	1.47E-10	0.027379	0.916198	0.6422502, 1.1353878
Bio10	74.3111	133.177	< 2.2E-16	0.966503	22.27854	20.74477, 21.87930
Bio11	6.645	104.824	1.39E-09	0.096488	0.818644	0.5066655, 0.9376465
Bio12	-21.5053	130.344	< 2.2E-16	1.557131	0.126633	-1.562093, -1.298903
Bio13	-4.7258	102.201	7.34E-06	0.238134	0.028411	-0.2977444, -0.1217016
Bio14	5.7952	116.343	5.94E-08	1.282126	2.118059	0.5502474, 1.1216186
Bio15	-34.9809	100.302	< 2.2E-16	9.423307	0.319461	-9.620159, -8.587533
Bio16	6.5672	123.319	1.28E-09	3.467918	6.243597	1.939078, 3.612280
Bio17	11.157	159	< 2.2E-16	2.751636	5.425441	2.200491, 3.147119
Bio18	-2.4577	174.548	1.50E-02	0.385125	0.201656	-0.33080186, -0.03613614
Bio19	56.2183	140.025	< 2.2E-16	12.48051	43.11678	29.55888, 31.71367

Table 3. Results of t-tests for permutation importances of environmental variables

Variable	T-statistic	Degrees of Freedom	P-value	Mean for austrina	Mean for balifouriana	95% CI
Bio1	13.3897	99.036	< 2.2E-16	0.05731	33.45746	28.45060, 38.34969
Bio2	-10.0919	99.015	< 2.2E-16	21.620139	0.105476	-25.74474, -17.28459
Bio3	-5.7831	107.274	7.32E-08	5.498178	1.203155	-5.767273, -2.822773
Bio4	5.0626	99.877	1.89E-06	0.05002	1.909729	1.130907, 2.588511
Bio5	-2.5182	99.002	0.0134	1.009294	0.005323	-1.7950567, -0.2128853
Bio6	-2.1041	108.451	0.03768	0.528259	0.122594	-0.78780562, -0.02352438
Bio7	-2.6156	100.372	0.01028	0.006806	0.000365	-0.011326317, -0.001555683
Bio8	-8.9681	99	1.94E-14	1.142317	0	-1.3950578, -0.8895762
Bio9	-5.1983	103.893	1.01E-06	0.606442	0.058224	-0.7573552, -0.3390808
Bio10	11.456	99	< 2.2E-16	0.00926	21.76423	17.98694, 25.52300
Bio11	9.8341	99.289	2.45E-16	0.28138	13.55273	10.59369, 15.94902
Bio12	-10.5851	178.594	< 2.2E-16	7.32505	1.139662	-7.338507, -5.032269
Bio13	-2.8102	99.106	5.97E-03	2.145827	0.044542	-3.5849254, -0.6176446
Bio14	13.7616	195.551	< 2.2E-16	4.312878	14.260574	8.522097, 11.373295
Bio15	-17.4851	100.529	< 2.2E-16	50.702773	2.577548	-53.58548, -42.66497
Bio16	9.3524	99.221	2.78E-15	0.158294	6.375161	4.897930, 7.535804
Bio17	2.473	122.969	0.01476	0.089471	0.278219	0.03767089, 0.33982511
Bio18	-4.8486	111.285	4.07E-06	1.189302	0.178052	-1.4245239, -0.5979761
Bio19	-0.2436	197.594	8.08E-01	3.266983	2.966944	-2.728722, 2.128644

Table 4. Average AUC values for test and training samples for both regions at each time period

	Mean Training AUC	SD of Training AUC	Mean Test AUC	SD of Test AUC
Current *Austrina*	0.994665347	0.000598571	0.992818812	0.004114941
Current *Balfouriana*	0.996987129	0.000503917	0.996434653	0.001828794
21K *Austrina*	0.994415842	0.000632097	0.990590099	0.008892238
21K *Balfouriana*	0.997268317	0.000523246	0.996968317	0.001528393
120K *Austrina*	0.994471287	0.000585719	0.991043564	0.007590394
120K *Balfouriana*	0.997035644	0.000565789	0.996863366	0.001440744

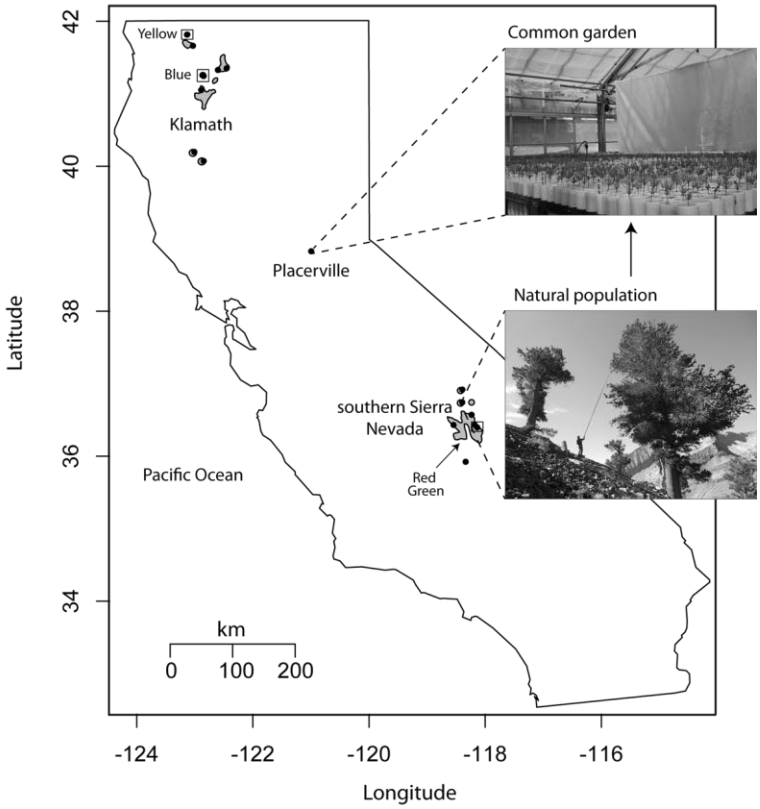

Figure 1. Shows the actual present day geographic distribution of foxtail pine. Foxtail pine exists in two regional populations separated by approximately 500km. A common garden located in Placerville, CA houses saplings which provided all phenotypic measurements for this project (Friedline *et al.*, 2014).

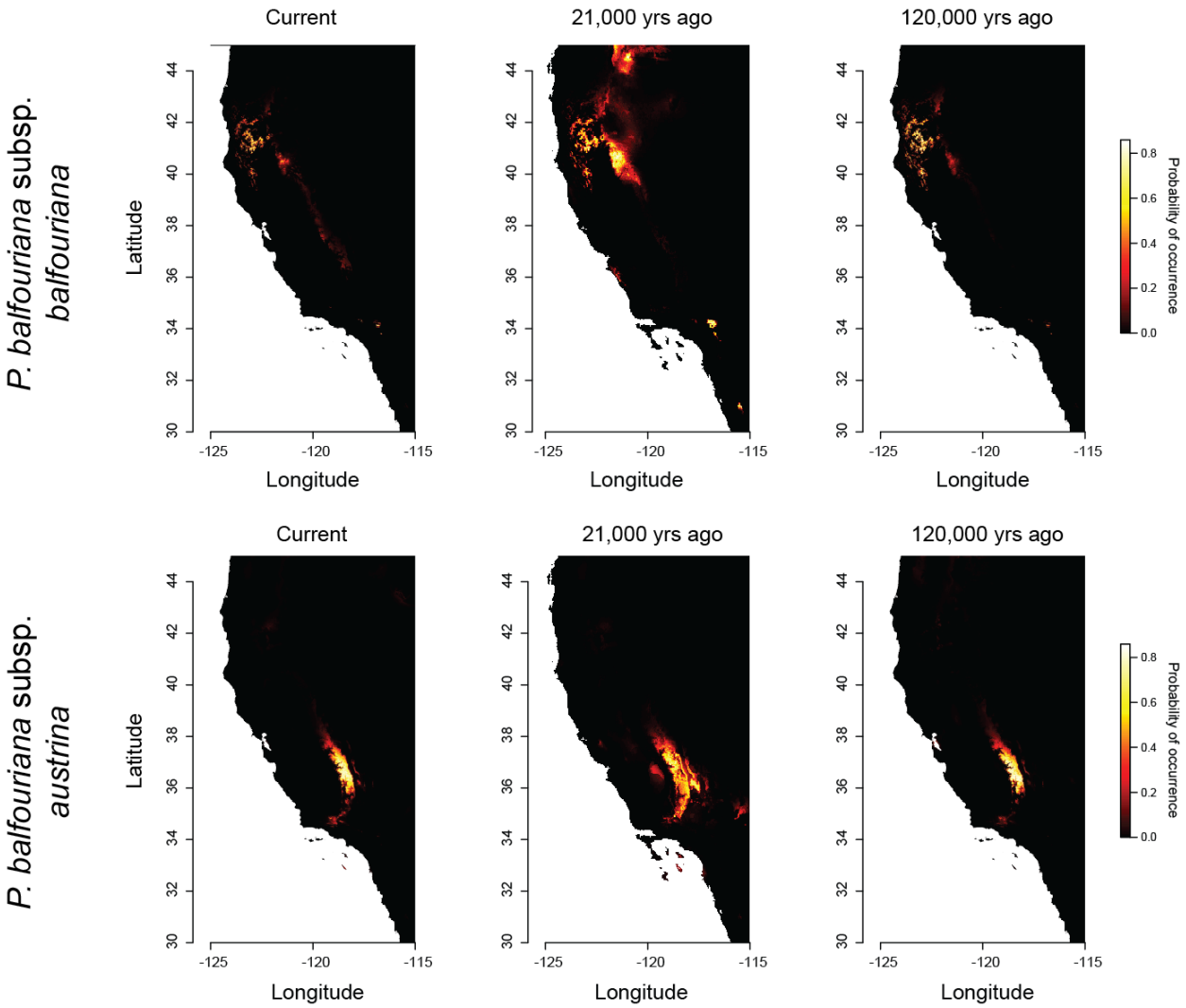

Figure 2. Shows the predicted geographic range of two regional populations of foxtail pine (*P. balfouriana subsp. balfouriana* and *P. balfouriana subsp. austrina*) at three different time periods; present day, 21,000 years ago and 120,000 years ago.

Chapter 2

Introduction

The second question this project attempted to address was whether water-use efficiency is genetically controlled in foxtail pine, and whether this differs between the northern and southern populations. This was done using univariate generalized linear mixed models to predict water-use efficiency based on carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) isotope discrimination measurements from regional population and family identifiers as fixed and random effects, respectively. There would be evidence of the heritability of water-use efficiency if family identifiers were found to account for a significant portion of the variation in $\delta^{13}C$, because genetically controlled phenotypes are expected to possess similar values within families. There are five different populations, or family groups of foxtail pine; three come from the northern Klamath Mountain region of California and two come from the southern Sierra Nevada region of California. $\delta^{13}C$ has been demonstrated as being highly correlated with water-use efficiency in plants and thus is used as a proxy for water-use efficiency in this project (Cregg and Zhang, 2000). There is evidence of a significant amount of phenotypic variation in the $\delta^{13}C$ trait, as well as evidence for a high amount of heritability for the trait

across a wide range of plant species, including forest trees (e.g. Brendel *et al.*, 2002; Cumbie *et al.*, 2011; Zhang *et al.*, 1994). Heritability is a measure of how much of the variation in a phenotype is due to genetics, as opposed to environment. High levels of heritability for $\delta^{13}C$ have been observed in crop species as well as in other plants (Zhang et al., 1994). Low $\delta^{13}C$ values in plants indicate greater water-use efficiency; conversely, high $\delta^{13}C$ values are correlated with low water-use efficiency in plants. Finding that $\delta^{13}C$ and $\delta^{15}N$ do not differ significantly between regions or populations would indicate that these traits are not genetically controlled. Determining whether or not the traits $\delta^{13}C$ and $\delta^{15}N$ vary based on population or regional identifiers is an important step towards establishing that these traits are genetically controlled, so that their genetic architecture can be resolved.

Methods and Materials

Generalized univariate linear mixed models were performed in order to determine if $\delta^{13}C$ and $\delta^{15}N$ are genetically controlled. These linear mixed models used data consisting of either $\delta^{13}C$ or $\delta^{15}N$ values for 187 half-siblings sampled from five maternal trees (*n* = three trees from the Klamath region; *n* = two trees from the southern Sierra Nevada region). $\delta^{13}C$ and $\delta^{15}N$ values were gathered from foxtail pine seedlings at a common garden. $\delta^{13}C$ will be used as a proxy for water-use efficiency. All analyses will be conducted using the lme4 library in the R computing environment (R Core Group, 2014).

Two distinct linear mixed models were compared, one of which included only effect due to families, while the other model included effects due to family nested within regional populations. These two models were used in order to determine whether or not family effects accounted for a significant amount of the variation in $\delta^{13}C$ and $\delta^{15}N$, which would support the hypothesis that the traits are heritable in foxtail pine. The two models were also used to assess the extent of the effect of region on the variation in $\delta^{13}C$ and $\delta^{15}N$.

The first set of linear mixed models were used to determine if $\delta^{13}C$ and $\delta^{15}N$ values differ significantly amongst the five family groups, which were treated as random effects. The statistical significance of the variance component for family identifiers was assessed using bootstrapping across families (n = 1,000 replicates). If the 95% confidence interval for this variance component excluded zero then it was deemed statistically significant.

The second set of linear mixed models were used to determine if regional population identifiers account for a significant portion of the observed variance in $\delta^{13}C$ and $\delta^{15}N$ among the five half-sibling families. These linear mixed models took family and regional identifiers into account. Regional population identifiers will be treated as a fixed effect, since there are only two regional populations. The statistical significance of the variance component for family identifiers and regional identifiers was assessed using bootstrapping across families (n = 1,000 replicates). If the 95% confidence interval for this variance component excluded zero it was deemed statistically significant.

Lastly, an Analysis of Deviance was used to test for a statistically significant difference between the model containing effects only for family and the linear model containing effects for family and regional population for both $\delta^{13}C$ and $\delta^{15}N$. This test assessed the significance of the more complex model relative to the less complex model. A critical threshold (α) of 0.05 was assumed for this test.

Results

Generalized univariate linear mixed models were performed on $\delta^{13}C$ and $\delta^{15}N$ data gathered from five family groups native to two regional populations using the lme4 library in the programming language R. The first set of models consisted only of family identifiers and was used to estimate the variance component of family identifiers' contribution to the $\delta^{13}C$ and $\delta^{15}N$ traits (Table 5). The second set of models included both family and regional identifiers, and was used to estimate the variance components of family and regional identifiers to the $\delta^{13}C$ and $\delta^{15}N$ traits (Table 6).

For the first set of models that included solely family identifiers, family group was found to be a significant contributing factor to the variance found in the $\delta^{13}C$ and $\delta^{15}N$ traits. The calculated variance accounted for by family group was 2.256 (95% CI: 0.112 to 1.584) for $\delta^{13}C$ and 1.544 (95% CI: 0.106 to 1.64) for $\delta^{15}N$. The percent variance due to family effects for $\delta^{13}C$ 56.4%, meaning that family effects accounted for over half of the variation in the trait. The percent variance due to family effects for $\delta^{15}N$ was 38.6%. The remaining variance not accounted for by family identifiers in $\delta^{13}C$ and $\delta^{15}N$ was considered residual, and possessed a variance of 1.744 (95% CI: 0.26 to 0.39) for $\delta^{13}C$

and 2.456 (95% CI: 0.54 to 0.82) for $\delta^{15}N$. Because the 95% confidence intervals for the variances of family and residual effects excluded zero, the results imply that these effect contribute a significant amount of variance to the two traits.

For the second set of models which included both family and regional identifiers, family group was again found to be a significant contributing factor to the variance found in both the $\delta^{13}C$ and $\delta^{15}N$ traits. Regional identifiers, however, were not found to be significant; with a calculated variance of 2.04E-13 for $\delta^{13}C$ and 0.0217 for $\delta^{15}N$, and 95% confidence intervals which included zero, region was not found to be a large contributing factor to the overall variance for either trait. The calculated variance accounted for by family group was 2.256 (95% CI: 0.11 to 1.59) for $\delta^{13}C$ and 1.527 (95% CI: 0.099 to 1.64) for $\delta^{15}N$. The remaining variance not accounted for by family or regional identifiers in $\delta^{13}C$ and $\delta^{15}N$ was considered residual, and had a variance of 1.744 (95% CI: 0.26 to 0.40) for $\delta^{13}C$ and 2.451 (95% CI: 0.55 to 0.83) for $\delta^{15}N$. Both family and residual effects were found to have a high level of significance to $\delta^{13}C$ and $\delta^{15}N$ in the second set of models including both regional and familial identifiers due to the confidence intervals for the variance values excluding zero.

Finally, in order to determine whether or not there was a significant difference between the two linear mixed models Analysis of Deviance was performed. For both traits, the *p*-values returned were one, indicating no significant difference between the two models. These results provide further evidence that regional identifiers are not significant contributors to the overall variance of $\delta^{13}C$ and $\delta^{15}N$, due to the fact that the inclusion of regional effects was the only difference between the two models and the

models were not statistically different. Family identifiers were therefore the only important effects, contributing significant variation to both $\delta^{13}C$ and $\delta^{15}N$.

Conclusions and Discussion

The results support the hypothesis that water-use efficiency is genetically controlled in foxtail pine. Significant variance values calculated using linear mixed models indicate that $\delta^{13}C$ and $\delta^{15}N$ vary among family groups. This implies that in foxtail pine $\delta^{13}C$ and, therefore, water-use efficiency is genetically controlled. However, the hypothesis that water-use efficiency varies between the two regions was not supported by the results. Linear mixed models that included regional identifiers indicated that region was not a significant contributor to overall variance in the $\delta^{13}C$ and $\delta^{15}N$ traits.

Despite the inclusion of regional identifiers and familial identifiers in the second set of linear mixed models, there was no significant difference from the first set of linear mixed models which considered only familial identifiers. This highlights the negligible impact that regional identifiers have on the overall variance of $\delta^{13}C$ and $\delta^{15}N$. This supports a conclusion that the genetic control of water-use efficiency does not vary by region. An alternative explanation for these results could be the limited sample size of regions this project possesses; there are only two regional foxtail pine populations and only a small number of families was used to estimate effects (O'Hara and Merilä, 2005). Heritability was not estimated in this project due to this bias in the estimation of variances; it is likely that variances were overestimated.

The results support the conclusion that family group has a significant impact on $\delta^{13}C$ and $\delta^{15}N$ variation, implying that water-use efficiency is in fact genetically controlled. These results also show that regional differences do not significantly contribute to variation in the $\delta^{13}C$ and $\delta^{15}N$ traits. With the genetic basis of water-use efficiency established, the next chapter will deal with QTL mapping this trait by looking for significant correlations between $\delta^{13}C$ and $\delta^{15}N$ values and genetic markers ordered along a consensus linkage map.

Figures and Tables

Table 5. Displays variance values calculated from the first set of linear mixed models considering only familial identifiers.

	σ^2 Family	σ^2 Error
$\delta^{13}C$	2.256	1.744
$\delta^{15}N$	1.544	2.456

Table 6. Displays variance values calculated from the second set of linear mixed models considering both familial and regional identifiers.

	σ^2 Family	σ^2 Region	σ^2 Error
$\delta^{13}C$	2.256	2.04E-13	1.744
$\delta^{15}N$	1.527	0.0217	2.451

Chapter 3

Introduction

The third and final question this project attempted to answer was whether or not there are significant correlations between genetic markers on a consensus linkage map for foxtail pine and water-use efficiency. This consensus linkage map was created by utilizing megagametophyte array from four maternal trees in tandem with double-digestion restriction site associated DNA sequencing (ddRADseq) (Friedline *et al*., 2014). The resulting consensus linkage map covers 98.58% of foxtail pine's estimated 1276 cM-long genome with 901 unique positions (Friedline *et al*., 2014). The consensus linkage map possesses 20,655 total contigs (23 contigs per position) and an average spacing of 1.34 cM between adjacent positions (Friedline *et al*., 2014). 857 genomic positions of the original 901 were used due to lack of data at some positions. The genotypes (made up of SNPs) of foxtail pine individuals from the consensus linkage map were matched with their water-use efficiency phenotypes, which were measured using $\delta^{13}C$ as a proxy. Once matched, the data were analyzed for any statistically significant effects of genetic markers on water-use efficiency. Genetic markers found to significantly effect water-use efficiency values were considered quantitative trait loci (QTLs). QTLs are sections of genome containing genes that affect the variation of a quantitative trait. Locating QTLs would suggest that there is a gene or genes in the

genomic locus of that SNP that in some way affect the water-use efficiency trait. This experiment will also attempt to determine whether there is a difference in the effects of genetic markers on water-use efficiency between the two regional populations of foxtail pine.

Quantitative Trait Locus mapping (QTL mapping), relies on the trait of interest being heritable. Based on linear mixed model results, water-use efficiency is genetically controlled and therefore heritable. Typically, quantitative traits are multifactorial or polygenic, therefore multiple significant SNPs were expected to be found for a trait as complex as water-use efficiency (Lynch and Walsh, 1998). QTL maps mark the regions of DNA, which are significant in determining the variation within a trait. QTL mapping can reveal the number of genomic loci involved in controlling a phenotypic trait, as well as their specific location within the genome. This sort of QTL mapping has been done before for carbon discrimination in other plants (Chen *et al.*, 2011; Collard *et al.*, 2005; Teulat *et al.*, 2002). This QTL mapping endeavor utilized molecular markers with known locations on a linkage map to locate the potential gene (or genes) responsible for variation in water-use efficiency of foxtail pine. It is thus an important first step towards identifying the actual gene(s) responsible for variation in water-use efficiency in foxtail pine.

Methods and Materials

It will be determined if any genetic markers correlate with any variation in water-use efficiency as measured through $\delta^{13}C$ and $\delta^{15}N$ values obtained from foxtail pine

seedlings. A linkage map of foxtail pine with 857 genomic positions, each position containing an average of approximately 23 SNPs, was used to carry out this analysis. For each genomic position, one SNP was selected which had the most data present in each of the five family groups, as well as the largest number of families which possess more than one genotype (are polymorphic) for that SNP. One SNP was selected for each genomic position in order to define the positions. Additional SNPs for each position would not add any meaningful signal linking the variation in foxtail pine genotypes with the variation in phenotypic measurements because they exist at the same genetic locus and do not undergo recombination with one another.

Foxtail pine individual's genotypes were then matched with their phenotypic $\delta^{13}C$/ $\delta^{15}N$ measurement so that any correlation between genetic markers and $\delta^{13}C$/ $\delta^{15}N$ values in the foxtail pine individuals could be recorded. Genotypes were obtained using double-digestion restriction site associated DNA sequencing (ddRADSeq) a next generation sequencing technique which utilized EcoRI and MseI to do whole genomic DNA digestion followed by single-end sequencing on the Illumina HiSeq platform (Friedline *et al.*, 2014). The individuals comprise five different family groups belonging to two distinct regions, the northern Klamath Mountains and the Southern Sierra Nevada. These data were then run through the fastPHASE software which estimated missing genotypes from the known SNP genotype data conditional on the linkage map (Scheet and Stephens, 2006). The software imputed the count of the minor allele as the genotype for missing data into the file containing the foxtail pine genotypes in order to prepare it for the final stage of analysis leading up to QTL identification. Imputations that

had multiple solutions were averaged so that the genotype was the average count of the minor allele.

Completed data files with estimated SNP data imputed for missing data were then used to identify potential QTLs. All 857 genomic positions were assessed for a significant correlation between genetic markers and the traits $\delta^{13}C$ and $\delta^{15}N$. The statistical significance of the correlations were measured in the form of LOD scores, which were obtained through comparison of the likelihood of two distinct models. The first model considered effects on the correlation due to family identifiers alone, and the second model considered those effects plus an effect for the SNP. The LOD scores were calculated as a ratio of the log-likelihoods between these two models. A permutation test (n=1000 replicates) was conducted in order to correct for the increased chance of a false positive created by doing 857 tests of SNP significance. The permutation test involved randomizing phenotypes and reassigning them to genotypes; a minimum *p*-value and corresponding LOD score was recorded across positions for 1000 replicates of this test. A null LOD score distribution was generated from these minimum p-values, giving corrected significance levels for LOD scores. The top 5%, 1%, and 0.5% of LOD scores from this null distribution were used as significance levels for the unrandomized phenotypes, in order to determine correlations between SNPs and phenotypic values without the increased likelihood of a false positive QTL.

Results

Several genomic loci were discovered with significant correlation to $\delta^{13}C$ and $\delta^{15}N$ values based on LOD scores calculated from the ratio of log-likelihoods of two models (Appendix 5). The LOD scores for $\delta^{13}C$ ranged from 1.49E-5 to 7.526. The LOD scores for $\delta^{15}N$ ranged from 4.82E-6 to 6.287. The mean LOD score for $\delta^{13}C$ was 0.525. The mean LOD score for $\delta^{15}N$ was 0.429. The difference between the mean LOD scores of $\delta^{13}C$ and $\delta^{15}N$ was statistically significant (*p*-value = 0.0048). For $\delta^{13}C$ there were 152 LOD scores above one, 37 above two, 14 above three, four above four, three above five, two above six and one above seven. For $\delta^{15}N$ there were 108 LOD scores about one, 29 above two, nine above three, two above four, one above five, one above six and none above seven. For $\delta^{13}C$, linkage groups three (average LOD score = 0.604) and seven (average LOD score = 0.740) possessed higher average LOD scores than the average for their whole trait (0.525). For $\delta^{15}N$, linkage groups three (average LOD score = 0.530) and nine (average LOD score = 0.562) possessed higher average LOD scores than the average for their whole trait (0.429). 32 sites in the foxtail pine genome were significantly correlated with $\delta^{13}C$ values at a significance value of 0.05 (corresponds to a LOD score of 2.215). Four of those were significant at a significance value of 0.01 (corresponds to a LOD score of 4.173), and three of those were significant at a significance value of 0.005 (corresponds to a LOD score of 5.060). Twenty-one sites in the foxtail pine genome were significantly correlated with $\delta^{15}N$ values at a significance value of 0.05 (corresponds to a LOD score of 2.208). Two of those were significant at a value of 0.01 (corresponds to a LOD score of 4.147), and only one of

those was significant at a value of 0.005 (corresponds to a LOD score of 5.170). These significant sites were not concentrated at any particular genetic locus but occurred throughout the foxtail pine genome, in multiple positions on many different chromosomes. The chromosomes and positions of all significant sites found for $\delta^{13}C$ can be seen in Table 7. The chromosomes and positions of all significant sites found for $\delta^{15}N$ can be seen in Table 8. Genomic loci for each chromosome and the significance levels of their LOD scores can be seen in Figures 3 and 4.

Conclusions and Discussion

The results support the hypothesis that there are genetic markers that significantly correlate with the trait of water-use efficiency in foxtail pine. For the phenotypic measurements of $\delta^{13}C$ and $\delta^{15}N$, 32 and 21 of these significant sites were found, respectively. These sites were assessed at different significance levels in order to locate very highly significant (significance level of 0.005) correlations between the markers and the phenotypic values. For $\delta^{13}C$, three such sites were found on three separate chromosomes. These three sites are the most likely to be involved in variation within the trait of water-use efficiency in foxtail pine. For $\delta^{15}N$, a single site was found with a significance level of 0.005.

There are a variety of possible future directions with these results. Using a nucleotide database, such as BLAST, it may be possible to find sequences homologous to the significant sites discovered in this project in other plants. These homologous sequences, if already identified, may provide clues as to the specific role of the genes

present at the significant sites in the foxtail pine genome. Such insights may reveal unexpected and useful truths about water-use efficiency in plants.

Figures and Tables

Table 7. Shows the chromosomes, genomic loci and significance levels of all sites found to have a significant correlation with $\delta^{13}C$. Highly significant sites (significant level of 0.005) are bolded.

SNP Name	Chromosome	Genomic Locus	Significance Level	LOD Score
NODE_365865_length_63_cov_2.666667	1	37.68	0.05	2.474343868
NODE_111015_length_63_cov_2.333333	2	49.13	0.05	3.599346441
NODE_725758_length_63_cov_3.396825	2	51.85	0.05	3.62889348
NODE_185399_length_63_cov_2.000000	2	54.59	0.05	3.068175292
NODE_209737_length_65_cov_1.200000	2	56.5	0.05	2.997961783
NODE_702149_length_63_cov_2.984127	3	68.04	0.05	2.554208143
NODE_471677_length_63_cov_2.000000	3	73.89	0.005	7.525908354
NODE_181847_length_36_cov_4.750000	3	75.42	0.05	2.336732127
NODE_478283_length_63_cov_2.000000	4	17.96	0.05	2.512458296
NODE_74703_length_104_cov_1.413462	4	40.24	0.05	3.843580934
NODE_312028_length_63_cov_2.000000	4	77.4	0.05	2.653884377
NODE_328524_length_63_cov_2.031746	5	13.41	0.05	3.657382196
NODE_663707_length_31_cov_1.000000	5	21.47	0.05	2.42204261
NODE_280213_length	5	98.27	0.005	6.803862954

_63_cov_2.984127				
NODE_383390_length_63_cov_2.000000	6	26.21	0.05	2.935890179
NODE_184215_length_62_cov_1.000000	6	36.61	0.05	3.18135196
NODE_630880_length_35_cov_1.000000	6	39.86	0.05	3.564247052
NODE_126964_length_63_cov_3.317460	6	62.45	0.05	2.224679903
NODE_700789_length_63_cov_2.000000	6	68.9	0.05	2.825575106
NODE_390486_length_37_cov_1.108108	7	4.98	0.05	2.391060144
NODE_122515_length_63_cov_2.825397	7	16.59	0.05	3.445132807
NODE_660890_length_63_cov_3.730159	7	23.23	0.05	2.714237723
NODE_4492_length_63_cov_2.000000	7	37.36	0.05	2.515369693
NODE_679675_length_63_cov_2.000000	7	38.16	0.05	2.611303561
NODE_629517_length_63_cov_3.000000	7	44.8	0.05	2.262435475
NODE_64947_length_63_cov_2.904762	7	68.03	0.05	3.415371052
NODE_170882_length_104_cov_1.298077	8	41.71	0.05	2.334727634
NODE_440385_length_63_cov_2.000000	9	37.77	0.05	3.496660123
NODE_336754_length_63_cov_2.000000	10	13.03	0.005	5.15349439

NODE_730398_length_63_cov_2.000000	10	55.97	0.05	2.735603735
NODE_360827_length_63_cov_4.952381	11	91.02	0.05	2.259977234
NODE_332302_length_64_cov_2.921875	12	68.36	0.01	4.383484384

Table 8. Shows the chromosomes, genomic loci and significance levels of all sites found to have a significant correlation with $\delta^{15}N$. Highly significant sites (significant level of 0.005) are bolded.

SNP Name	Chromosome	Genomic Locus	Significance Level	LOD Score
NODE_180185_length_81_cov_1.074074	2	44.22	0.05	2.533640543
NODE_358990_length_63_cov_1.825397	2	66.6	0.05	2.598219154
NODE_660790_length_63_cov_2.000000	3	26.8	0.05	3.240620018
NODE_602602_length_63_cov_2.000000	3	30.43	0.01	4.631681269
NODE_728122_length_63_cov_2.936508	3	59.08	0.05	2.228312504
NODE_45888_length_62_cov_2.000000	4	21.87	0.005	6.286814373
NODE_464148_length_63_cov_2.000000	4	72.9	0.05	2.841606306
NODE_731758_length_63_cov_3.000000	5	76.48	0.05	3.202330844
NODE_379673_length_63_cov_3.000000	6	19.22	0.05	2.568546431
NODE_14521_length_37_cov_1.216216	6	33.49	0.05	2.370459388
NODE_552660_length_62_cov_2.693548	6	46.87	0.05	3.04498681
NODE_9449_length_63_	6	67.55	0.05	2.555799701

cov_2.984127				
NODE_477106_length_63_cov_4.587302	7	77.98	0.05	3.123173238
NODE_420387_length_63_cov_2.000000	7	91.25	0.05	2.39896563
NODE_247716_length_63_cov_5.682539	9	35.26	0.05	3.636281457
NODE_480605_length_63_cov_6.063492	9	50.85	0.05	2.749845828
NODE_52180_length_75_cov_1.053333	9	58.11	0.05	3.228357645
NODE_317988_length_63_cov_2.634921	10	5.69	0.05	2.71824159
NODE_93515_length_63_cov_2.000000	10	22.1	0.05	2.842163597
NODE_138015_length_62_cov_2.000000	12	15.89	0.05	2.357391052
NODE_332302_length_64_cov_2.921875	12	68.36	0.05	3.114380113

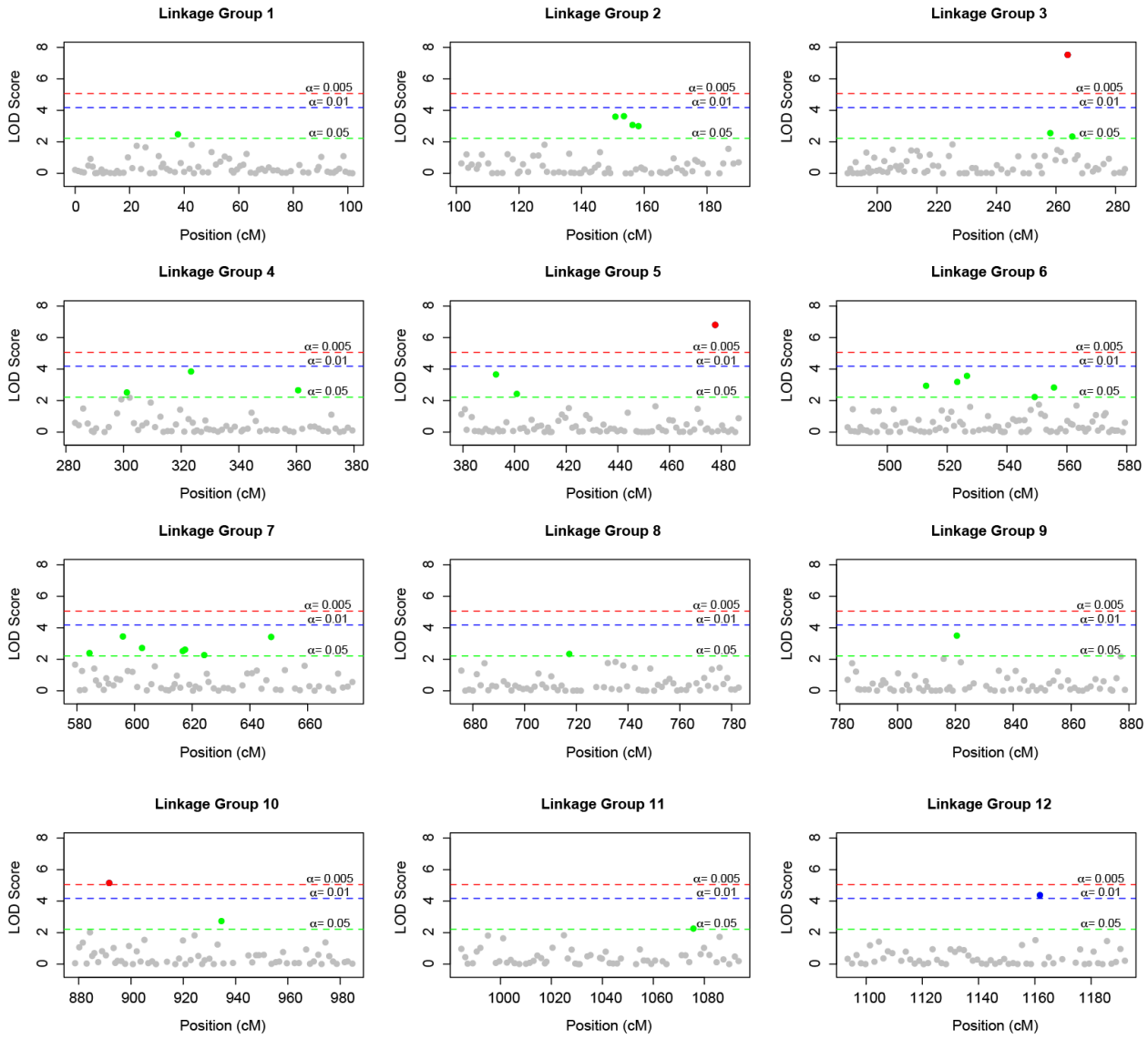

Figure 3. Genomic loci for each linkage group (chromosome) are plotted against their LOD scores. Horizontal dashed lines represent LOD scores corresponding to a particular significance level, visualizing SNPs that correspond to those significance levels for $\delta^{13}C$.

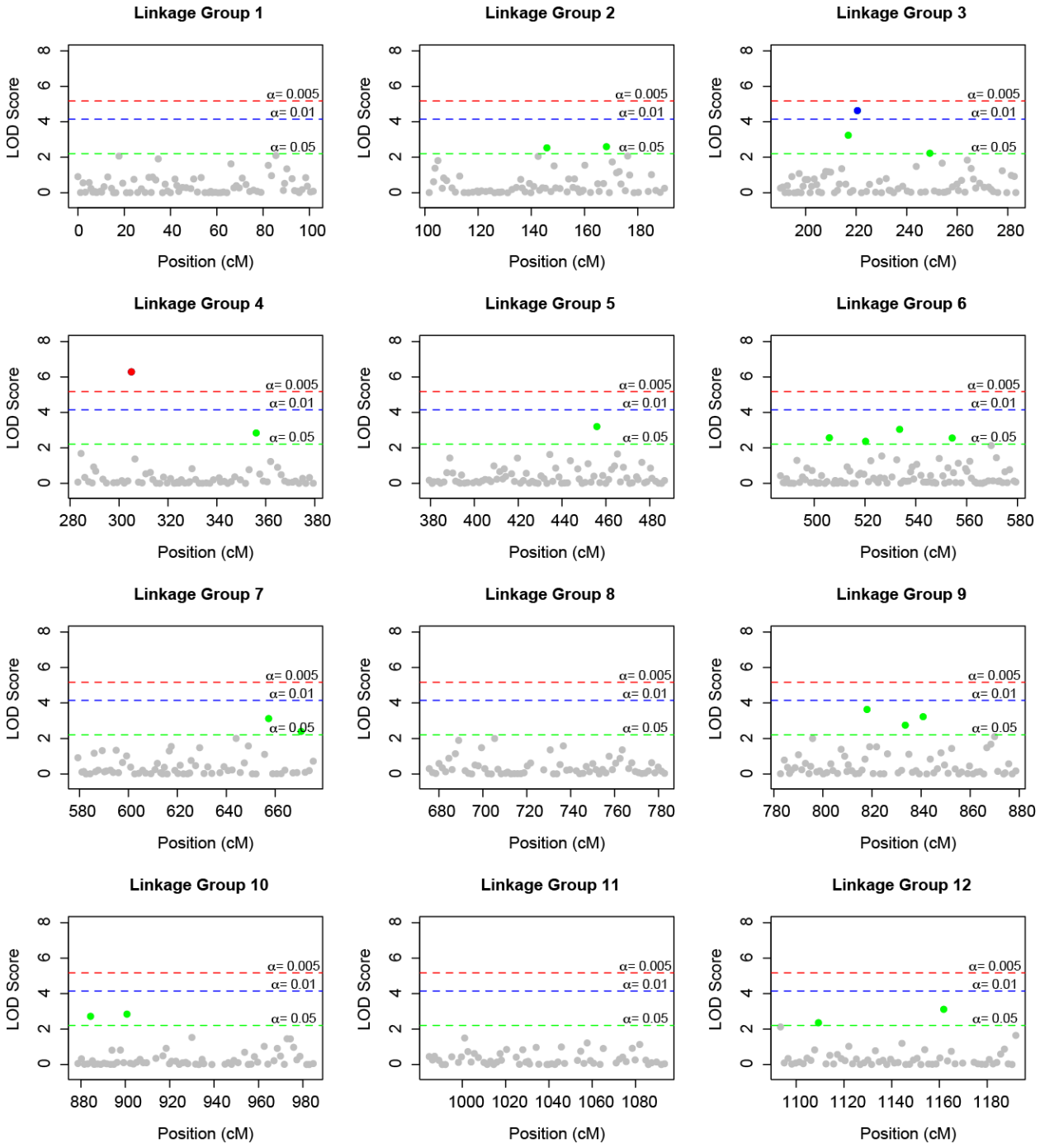

Figure 4. Genomic loci for each linkage group (chromosome) are plotted against their LOD scores. Horizontal dashed lines represent LOD scores corresponding to a particular significance level, visualizing SNPs that correspond to those significance levels for $\delta^{15}N$.

Conclusions

In the first chapter, environmental niche modeling was used to determine whether or not environmental variables such as temperature and precipitation have an effect on the geographic distribution of foxtail pine. Species distribution models created by Maxent using climatic variables predict the current known geographic distribution of foxtail pine with relative accuracy, with predicted ranges encompassing all known ranges for both regional populations. However, the species distribution models also projected occurrences of foxtail pine in places where none exist. This could indicate that these locations are suitable habitats for foxtail pine, but have not been occupied by the tree due to an ecological barrier. Models which individually predicted the geographic ranges of regional populations showed fewer inaccurate tree occurrences than combined models featuring both regional populations. With regional populations modeled individually, a more complete and accurate prediction of foxtail pine distribution was created.

The resultant species distribution models provide support for the hypothesis that environmental factors such as temperature and precipitation have a significant impact on the geographic distribution of foxtail pine. This conclusion is based on the fact that data for precipitation and precipitation related factors used in the creation of ecological

niche models were predictive of the current geographic distribution of two regional populations of foxtail pine, suggesting that they play a significant role in determining the fitness through survival and ecological niche of this species.

There is also evidence that the effects of precipitation and precipitation-related factors on the geographic distribution of foxtail pine differ between the two regional populations. Two-sample t-tests were used to compare the mean contribution scores for each environmental variable for each regional population. With the exception of the environmental variable BIO7, annual temperature range, for which there was no statistically significant difference, there was a significant difference (p-value < 0.05) in the effect of environmental variables on geographic distribution between regional populations. Permutation scores were also significantly different between populations for every environmental variable. Because contribution and permutation scores denote the relative importance of each environmental variable towards the construction of the species distribution model, it is telling that the scores were significantly different for all variables between regions. This indicates that the regional populations are very different in the ways that they are affected by precipitation and temperature related variables.

The northern regional population of foxtail pine in the Klamath mountains had its geographic distribution most highly influenced by the mean temperature of the warmest quarter (contribution score 22.3, permutation importance 21.8), annual mean temperature (permutation importance 33.5), mean temperature of the coldest quarter (permutation importance 13.6), and precipitation of the coldest quarter (contribution score 43).

In contrast, the most important variables in determining geographic distribution for the southern population of foxtail pine were the mean diurnal range (contribution score 13.2, permutation importance 21.6), max temperature of the warmest month (contribution score 44.3), precipitation of the coldest quarter (contribution score 12.5), and precipitation seasonality (permutation importance 50.7).

The contribution and permutation scores for these environmental variables were significantly larger than average (average contribution = 5.31; average permutation importance = 5.37) indicating a much larger than average effect on species distribution. All were significantly larger in their respective regional population than in the other, showing again that the impact of these variables on geographical distribution varies with region. One environmental variable, precipitation of the coldest quarter, had a significantly large effect on both regional populations, showing evidence of an increased sensitivity in foxtail pine to the amount of rainfall available at cooler temperatures. This is possibly due to the trees' need to avoid winter desiccation. These results support the conclusion that the northern and southern populations of foxtail pine differ in their distributions as a result of precipitation and precipitation-related factors.

The results of Chapter 1 showed that precipitation-related variables are predictive of the geographic range of foxtail pine, indicating an impact of these factors on fitness through survival. The results of the chapter also show a difference in the effect of environmental variables on geographic range between regions.

In the second chapter, linear mixed models were used to determine whether or not water use efficiency is genetically controlled in foxtail pine. Two linear mixed models

were used to answer this question; one which treated family identifiers as random effects explaining phenotype, and a second which also took region into account as a fixed effect with family nested within it as a random effect. The models were used to assess how much of the variance for the traits $\delta^{13}C$ and $\delta^{15}N$ could be attributed to family and regional identifiers.

Significantly large variance values calculated using these linear mixed models indicated that $\delta^{13}C$ and $\delta^{15}N$ vary among family groups, and therefore family group accounts for some amount of the variance within the trait. The implication of these results is that $\delta^{13}C$ and, therefore, water use efficiency, are genetically controlled in foxtail pine. $\delta^{15}N$ also had a significant amount of its variance explained by familial identifiers, to a somewhat lesser extent. In contrast to the results for family identifiers, variance results for regional identifiers from the second model revealed that region accounted for very little of the variance within $\delta^{13}C$ and $\delta^{15}N$. Linear mixed models which included regional identifiers indicated that region was not a significant contributor to overall variance in the $\delta^{13}C$ and $\delta^{15}N$ traits, therefore these traits do not vary significantly with region.

To confirm whether there was any significant difference between the two linear mixed models, they were compared using ANOVA. P-values of 1 were obtained from the comparison for both $\delta^{13}C$ and $\delta^{15}N$ indicating that there was no significant difference between the two models. This finding was simply further confirmation that the inclusion of regional identifiers has no effect on the amount of variance explained by familial identifiers. Regional identifiers had a negligible effect on the overall variance of $\delta^{13}C$

and $\delta^{15}N$ supporting the conclusion that the genetic control of water use efficiency does not vary by region. Alternatively, these results could be explained by small sample sizes. Only two regions exist for foxtail pine worldwide, and five family groups were sampled for this project.

The results of Chapter 2 show that water use efficiency varies significantly between family groups, but does not vary significantly between the two regional groups. Because family groups share genetics, this finding indicates that water use efficiency is genetically controlled in foxtail pine, and that it does not vary between regions.

In the third chapter, genomic loci were assessed for significant correlations with $\delta^{13}C$ and $\delta^{15}N$, and by proxy, water use efficiency. A number of genetic markers were found with significant correlations to both $\delta^{13}C$ and $\delta^{15}N$. In total, 32 significant markers were found for $\delta^{13}C$ and 21 were found for $\delta^{15}N$. After a permutation test to correct for a chance of false positives from conducting 857 tests for correlation, three markers were found to have a very high level of significance (significance level 0.005) for $\delta^{13}C$. A single marker was found at the same significance level for $\delta^{15}N$. These three sites are the most likely to be involved in variation within the trait of water use efficiency in foxtail pine. At these sites it is most likely that genes and gene promoters involved in water use efficiency processes could be found. The discovery of these significant markers provides evidence to support the hypothesis that there are genetic markers which correlate significantly with water use efficiency in foxtail pine.

The results of Chapter 3 show that gene markers exist which correlate significantly with water use efficiency. Thus, the genetic loci of some of the genetic

components of water use efficiency were identified. Significant loci for $\delta^{13}C$ and $\delta^{15}N$ were found, indicating that both traits possess heritable variation which makes adaptation to the precipitation-related changes to climate change possible for foxtail pine.

The genetic markers which correlate significantly with water use efficiency give indications of the locations of some of the genetic components of this trait. Variation within the trait of water use efficiency could allow foxtail pine and other species to adapt to shifting climate regimes and avoid extinction. Knowing the full complement of genetic components attached to water use efficiency is necessary in order to understand how to potentially manipulate the established variation in this trait in order to prepare for the oncoming effects of climate change. Finding homologous sequences for regions containing significant QTLs should be a priority, as this could help to identify important genes involved in controlling water use efficiency in plants.

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Appendix 1: Herbarium Data for Foxtail Pine Occurrences

Specimen Number	Subspecies	County	Elevation	Latitude	Longitude	Datum
UC1452389	Balfouriana	Tulare	9445 ft	35.91722	-118.31805	NA
UC1452390	Balfouriana	Tulare	9710 ft	35.91722	-118.31805	NA
HSC1452	Balfouriana	Tulare	2942 m	35.92333	-118.33167	NA
UC1713754	Balfouriana	Tulare	NA	35.92389	-118.33361	NA
UCR83625	Austrina	Tulare	2896 m	35.92389	-118.33361	NA
CAS361608	Balfouriana	Tulare	8500 ft	36.23420	-118.19940	NAD27
UC484186	Balfouriana	Tulare	10000 ft	36.24278	-118.15428	NAD27
UC909392	Balfouriana	Tulare	9600 ft	36.26417	-118.55222	NA
RSA59043	Balfouriana	Tulare	3049 m	36.26500	-118.12690	WGS84
DS212496	Balfouriana	Tulare	10000 ft	36.26500	-118.12690	WGS84
DS688612	Balfouriana	Tulare	10000 ft	36.26500	-118.12690	WGS84
RSA1957	Balfouriana	Tulare	3049 m	36.26500	-118.12690	WGS84
CAS361609	Balfouriana	Tulare	11600 ft	36.26500	-118.12690	WGS84
UC644469	Balfouriana	Tulare	10500 ft	36.26505	-118.11718	NAD27
UCSB51029	Balfouriana	Tulare	3530 m	36.28333	-118.11667	NA
RSA796278	Balfouriana	Tulare	3530 m	36.28333	-118.11667	NA
UC64468	Balfouriana	Tulare	NA	36.30391	-118.27016	NAD27
CAS672791	Balfouriana	Tulare	NA	36.30720	-118.45070	WGS84
SEINET954516	Balfouriana	Tulare	10457 ft	36.37770	-118.57457	WGS 84
SEINET954513	Balfouriana	Tulare	10457 ft	36.37770	-118.57457	WGS 84
A354390	Balfouriana	Tulare	3048-3352.8 m	36.39940	-118.57090	NAD27

RSA551546	Balfouriana	Tulare	3100 m	36.40000	-118.55000	NA
CAS563035	Balfouriana	Tulare	9500 ft	36.41050	-118.59100	WGS84
UCR157048	Balfouriana	Tulare	2287 - 2744 m	36.43000	-118.58417	NA
UC1134096	Balfouriana	Tulare	8800 ft	36.43412	-118.42471	NAD27
UCR230059	Austrina	Inyo	3037 m	36.44806	-118.16972	NA
SJSU1298	Balfouriana	Tulare	9000 ft	36.45080	-118.59310	NAD27
JEPS46798	Balfouriana	Tulare	NA	36.45494	-118.47300	WGS84
JEPS47902	Balfouriana	Inyo	8500 ft	36.46170	-118.13080	WGS84
RSA384293	Balfouriana	Tulare	2878 m	36.46180	-118.45610	NAD27
UC1061651	Balfouriana	Tulare	NA	36.46184	-118.45615	NAD27
UCR46272	Balfouriana	Inyo	3049 m	36.46400	-118.15411	NA
UC1452392	Balfouriana	Tulare	9920 ft	36.46667	-118.58417	NA
HSC1463	Balfouriana	Tulare	2957 m	36.46833	-118.59333	NA
DS129258	Balfouriana	Inyo	9500 ft	36.46900	-118.12920	WGS84
POM129546	Balfouriana	Inyo	9500 ft	36.46900	-118.12920	WGS84
SFV7033	Balfouriana	Inyo	3095 m	36.48000	-118.18000	NAD27
DS309863	Balfouriana	Tulare	NA	36.48370	-118.56010	WGS84
SFV6977	Balfouriana	Inyo	3232 m	36.48960	-118.19520	WGS84
UCR54558	Balfouriana	Inyo	3293 - 3330 m	36.49389	-118.15806	NA
CAS357778	Balfouriana	Inyo	11100 ft	36.49520	-118.21430	WGS84
RSA652561	Balfouriana	Inyo	NA	36.49900	-118.22040	WGS84
SFV7013	Balfouriana	Inyo	3415 m	36.50000	-118.22000	NAD27
SFV7014	Balfouriana	Inyo	3415 m	36.50000	-118.22000	NAD27
SFV7015	Balfouriana	Inyo	3415 m	36.50000	-118.22000	NAD27
RSA509479	Balfouriana	Inyo	3293 m	36.50000	-118.15833	NA
CAS300241	Balfouriana	Tulare	NA	36.51660	-118.49120	NAD27
JEPS7974	Balfouriana	Tulare	11500 ft	36.55177	-118.35484	NAD27
RSA128604	Balfouriana	Inyo	11200 ft	36.56710	-118.26460	WGS84
UC1452393	Balfouriana	Tulare	10560 ft	36.56750	-118.65111	NA

UC1142896	Balfouriana	Inyo	10900 ft	36.57030	-118.26530	WGS84
JEPS46802	Balfouriana	Inyo	10900 ft	36.57030	-118.26530	WGS84
JEPS18565	Balfouriana	Inyo	10900 ft	36.57030	-118.26530	WGS84
UC1142897	Balfouriana	Inyo	10900 ft	36.57030	-118.26530	WGS84
UC1200627	Balfouriana	Inyo	10600 ft	36.57050	-118.26290	WGS84
CAS227937	Balfouriana	Inyo	10300 ft	36.57360	-118.25700	WGS84
CAS227938	Balfouriana	Inyo	10300 ft	36.57360	-118.25700	WGS84
CAS584585	Balfouriana	Inyo	9800 ft	36.57790	-118.24660	WGS84
SFV6761	Balfouriana	Inyo	3018 m	36.57800	-118.25200	NAD27
LA35066	Balfouriana	Inyo	10000.0 ft	36.57810	-118.25090	WGS 1984
RSA384281	Balfouriana	Inyo	4268 m	36.57830	-118.29250	WGS84
UC400330	Balfouriana	Tulare	NA	36.57832	-118.65296	NAD27
UC1134095	Balfouriana	Tulare	8000 ft	36.57832	-118.65296	NAD27
DS124131	Balfouriana	Tulare	NA	36.57860	-118.29250	WGS84
LA35067	Balfouriana	Inyo	9700.0 ft	36.57970	-118.25090	WGS 1984
CAS586327	Balfouriana	Inyo	9500 ft	36.58000	-118.24860	WGS84
POM263125	Balfouriana	Inyo	2744 m	36.58170	-118.24600	WGS84
RSA384295	Balfouriana	Inyo	9700 ft	36.58250	-118.25120	WGS84
RSA670687	Balfouriana	Inyo	9700 ft	36.58250	-118.25120	WGS84
DS309278	Balfouriana	Tulare	8500 ft	36.58300	-118.66730	WGS84
A246873	Balfouriana	Tulare	NA	36.58300	-118.66730	WGS84
GH246864	Balfouriana	Tulare	NA	36.58300	-118.66730	WGS84
POM264446	Balfouriana	Tulare	2591 m	36.58300	-118.66730	WGS84
RSA31090	Balfouriana	Tulare	2591 m	36.58300	-118.66730	WGS84
UCR3859	Balfouriana	Inyo	3049 m	36.58361	-118.26056	NA
SD28279	Balfouriana	Inyo	9302 ft	36.58420	-118.24860	WGS84
HSC63891	Austrina	Tulare	3225 m	36.59000	-118.66167	NA
LA6033	Balfouriana	Tulare	11000.0 ft	36.59000	-118.66300	WGS 1984
UC1713753	Balfouriana	Tulare	NA	36.59058	-118.66257	NAD27

UC665722	Austrina	Tulare	8500 ft	36.59058	-118.66257	NAD27
RSA384280	Balfouriana	Inyo	NA	36.59760	-118.18540	WGS84
SD37229	Balfouriana	Inyo	NA	36.60480	-118.06310	WGS84
UCSB26541	Balfouriana	Tulare	3398 m	36.63590	-118.70170	NAD27
UC1452394	Balfouriana	Tulare	10340 ft	36.65083	-118.70028	NA
UC1452388	Balfouriana	Tulare	10340 ft	36.66460	-118.70610	NAD27
A246855	Balfouriana	Tulare	NA	36.70490	-118.42260	WGS84
CAS278691	Balfouriana	Tulare	NA	36.70490	-118.42260	WGS84
CAS280167	Balfouriana	Tulare	NA	36.70490	-118.42260	WGS84
POM261453	Balfouriana	Tulare	NA	36.70490	-118.42260	WGS84
DS299593	Balfouriana	Tulare	NA	36.70490	-118.42260	WGS84
CAS343339	Balfouriana	Fresno	9500-10000 ft	36.75700	-118.40520	WGS84
JEPS46801	Balfouriana	Fresno	NA	36.75940	-118.41200	NAD27
JEPS47901	Balfouriana	Fresno	9000 ft	36.75940	-118.41200	NAD27
CAS280536	Balfouriana	Fresno	NA	36.76320	-118.40430	WGS84
UC1333502	Balfouriana	Inyo	11500-12000 ft	36.76690	-118.32960	WGS84
UC1452391	Balfouriana	Inyo	9410 ft	36.76695	-118.33389	NA
UC1452403	Balfouriana	Inyo	9335 ft	36.76695	-118.33389	NA
SBBG118559	Balfouriana	Inyo	9500 ft	36.77000	-118.34100	NAD27
A246861	Balfouriana	Inyo	NA	36.77030	-118.34950	WGS84
A354521	Balfouriana	Inyo	NA	36.77030	-118.34950	WGS84
GH246872	Balfouriana	Inyo	NA	36.77030	-118.34950	WGS84
GH354518	Balfouriana	Inyo	NA	36.77030	-118.34950	WGS84
UC665708	Balfouriana	Inyo	10000 ft	36.77030	-118.34950	WGS84
DS309281	Balfouriana	Inyo	10000 ft	36.77030	-118.34950	WGS84
NY49398	Balfouriana	Inyo	NA	36.77030	-118.34950	WGS84
RSA31094	Balfouriana	Inyo	10000 ft	36.77030	-118.34950	WGS84
UCR153376	Balfouriana	Inyo	2896 m	36.77056	-118.34472	NA
UCSB41930	Balfouriana	Inyo	2834 m	36.77060	-118.34030	WGS84

RSA537397	Balfouriana	Inyo	NA	36.77060	-118.35200	WGS84
POM265529	Balfouriana	Fresno	3232 m	36.77090	-118.40580	WGS84
POM265530	Balfouriana	Fresno	3232 m	36.77090	-118.40580	WGS84
UCR131462	Balfouriana	Inyo	2805 m	36.77111	-118.34111	NA
UCR131773	Balfouriana	Inyo	2805 m	36.77111	-118.34111	NA
UCR19216	Balfouriana	Inyo	NA	36.77111	-118.34556	NA
UC1479642	Balfouriana	Inyo	9200 ft	36.77140	-118.33920	WGS84
JEPS47898	Balfouriana	Inyo	11000 ft	36.77140	-118.36650	WGS84
HSC1445	Balfouriana	Plumas	2881 m	36.77167	-118.34000	NA
UCSB50115	Balfouriana	Inyo	3018 m	36.77230	-118.34120	WGS84
UC716238	Balfouriana	Inyo	9000-9500 ft	36.77280	-118.33850	WGS84
A246871	Balfouriana	Inyo	NA	36.77280	-118.33850	WGS84
A354522	Balfouriana	Inyo	NA	36.77280	-118.33850	WGS84
DS265682	Balfouriana	Inyo	9000-9500 ft	36.77280	-118.33850	WGS84
DS571832	Balfouriana	Inyo	9000-9500 ft	36.77280	-118.33850	WGS84
CAS297642	Balfouriana	Inyo	9000-9500 ft	36.77280	-118.33850	WGS84
POM258763	Balfouriana	Inyo	2744 - 2896 m	36.77280	-118.33850	WGS84
UC1323647	Balfouriana	Inyo	9300 ft	36.77290	-118.34250	WGS84
CAS463791	Balfouriana	Inyo	9300 ft	36.77290	-118.34250	WGS84
A246858	Balfouriana	Inyo	NA	36.77290	-118.34250	WGS84
SJSU14616	Balfouriana	Inyo	9100 ft	36.77320	-118.33730	WGS84
A311186	Balfouriana	Fresno	NA	36.77330	-118.49100	WGS84
RSA616602	Balfouriana	Inyo	9500 ft	36.77370	-118.34430	WGS84
RSA634215	Balfouriana	Inyo	9500 ft	36.77370	-118.34430	WGS84
UC1061500	Balfouriana	Inyo	9000 ft	36.77400	-118.33500	WGS84
UC694298	Balfouriana	Inyo	9000 ft	36.77400	-118.33500	WGS84
SBBG24247	Balfouriana	Inyo	NA	36.77400	-118.33900	NAD83
SBBG116905	Balfouriana	Inyo	9100 ft	36.77400	-118.33900	NAD83
OBI7591	Balfouriana	Inyo	9000 ft	36.77410	-118.33320	WGS84

A354519	Balfouriana	Inyo	NA	36.77490	-118.33630	WGS84
UC1362056	Balfouriana	Inyo	9300 ft	36.77560	-118.33580	NA
RSA61092	Balfouriana	Inyo	8500 ft	36.77660	-118.32380	WGS84
CAS1035105	Balfouriana	Fresno	3305 m	36.85111	-118.39444	NA
CAS409213	Balfouriana	Inyo	10400 ft	36.88470	-118.35360	WGS84
CAS402304	Balfouriana	Fresno	10000 ft	36.93730	-118.47600	WGS84
UC1094330	Balfouriana	Fresno	9900 ft	36.96211	-118.46264	NAD27
UC400296	Balfouriana	Fresno	11000 ft	36.96463	-118.73515	NAD27
GH246870	Balfouriana	Fresno	NA	36.96690	-118.46350	WGS84
JEPS76511	Balfouriana	Inyo	8500 ft	37.01667	-118.38333	NA
RSA384292	Balfouriana	Fresno	NA	37.15180	-118.84800	WGS84
GH246875	Balfouriana	Stanislaus	NA	37.43750	-121.33330	WGS84
UC1452398	Balfouriana	Tehama	7700 ft	40.03361	-122.85028	NA
HSC1388	Balfouriana	Tehama	2409 m	40.03667	-122.85333	NA
UCSB23622	Balfouriana	Tehama	2438 m	40.03910	-122.86120	WGS84
UC1037449	Balfouriana	Tehama	7800 ft	40.04170	-122.90230	WGS84
RSA123636	Balfouriana	Tehama	2378 m	40.04170	-122.90230	WGS84
DS366536	Balfouriana	Trinity	7100 ft	40.18090	-122.97550	WGS84
RSA66443	Balfouriana	Trinity	2165 m	40.18090	-122.97550	WGS84
CAS376251	Balfouriana	Trinity	7100 ft	40.18090	-122.97550	WGS84
HSC39117	Balfouriana	Tehama	2287 m	40.18470	-122.96210	WGS84
UCR3733	Balfouriana	Trinity	NA	40.20500	-122.98139	NA
UC1134094	Balfouriana	Trinity	8000 ft	40.20920	-122.99760	NA
HSC40495	Balfouriana	Trinity	2287 m	40.95560	-122.88090	WGS84
HSC32215	Balfouriana	Trinity	2012 m	40.97520	-123.06880	WGS84
CAS584540	Balfouriana	Siskiyou	6880 ft	41.01850	-122.97160	WGS84
HSC45575	Balfouriana	Siskiyou	NA	41.04920	-122.91590	WGS84
HSC1411	Balfouriana	Siskiyou	2058 m	41.05000	-122.91000	NA
UC1452395	Balfouriana	Trinity	6800 ft	41.05000	-122.91000	NA

UC1452396	Balfouriana	Trinity	6800 ft	41.05000	-122.90083	NA
UC688867	Balfouriana	Siskiyou	7000 ft	41.05190	-122.84780	NA
UC688866	Balfouriana	Siskiyou	7000 ft	41.05260	-122.84770	NA
UCSB24830	Balfouriana	Trinity	2133 m	41.05320	-122.91340	NAD27
UC400297	Balfouriana	Trinity	NA	41.05790	-122.90780	NAD27
A311185	Balfouriana	Trinity	NA	41.05790	-122.90780	NAD27
SFV20775	Balfouriana	Siskiyou	2160 m	41.06000	-122.92000	NAD27
HSC40897	Balfouriana	Trinity	2341 m	41.16660	-122.80550	WGS84
JEPS46803	Balfouriana	Siskiyou	6000 ft	41.23900	-122.77150	NA
UC1199672	Balfouriana	Siskiyou	6000 ft	41.23900	-122.77150	NA
HSC70593	Balfouriana	Siskiyou	2324 m	41.24200	-122.94760	WGS84
HSC31504	Balfouriana	Siskiyou	NA	41.30260	-122.95280	WGS84
HSC4807	Balfouriana	Siskiyou	2195 m	41.30310	-122.93890	WGS84
HSC26017	Balfouriana	Siskiyou	2195 m	41.30500	-122.95833	NA
HSC32576	Balfouriana	Siskiyou	2073 m	41.30650	-122.95460	WGS84
HSC92115	Balfouriana	Siskiyou	2378 m	41.30830	-122.48850	WGS84
UC338690	Balfouriana	Siskiyou	NA	41.30978	-122.48080	NAD27
UC1452402	Balfouriana	Siskiyou	7450 ft	41.31420	-122.46660	NA
CAS409959	Balfouriana	Siskiyou	7900-8700 ft	41.31620	-122.48490	WGS84
DS61213	Balfouriana	Siskiyou	NA	41.31660	-122.48670	WGS84
UCD102281	Balfouriana	Trinity	2640 m.	41.31667	-122.48333	NA
JEPS120261	Balfouriana	Trinity	7820 ft	41.31817	-122.49164	NA
JEPS57744	Balfouriana	Trinity	7800 ft	41.31840	-122.49115	NAD27
JEPS57147	Balfouriana	Trinity	7800 ft	41.31866	-122.48958	NAD27
CHSC55794	Balfouriana	Trinity	7800 ft	41.31917	-122.50528	NAD83
CAS95181	Balfouriana	Siskiyou	NA	41.31950	-122.47930	WGS84
UC1713756	Balfouriana	Siskiyou	NA	41.31999	-122.47674	NAD27
UC1452401	Balfouriana	Siskiyou	7300 ft	41.32000	-122.48333	NA
A246857	Balfouriana	Unknown	NA	41.32000	-122.47670	NAD27

DS61212	Balfouriana	Siskiyou	NA	41.32000	-122.47670	NAD27
HSC1364	Balfouriana	Siskiyou	2226 m	41.32000	-122.48333	NA
HSC1371	Balfouriana	Siskiyou	2271 m	41.32000	-122.48333	NA
UC1585380	Balfouriana	Siskiyou	2440 m	41.32990	-122.51972	NAD27
JEPS57149	Balfouriana	Trinity	7100 ft	41.33995	-122.50375	NAD27
JEPS57745	Balfouriana	Trinity	7100 ft	41.33995	-122.50375	NAD27
GH403119	Balfouriana	Siskiyou	NA	41.34131	-122.53367	EPSG:4326
GH403120	Balfouriana	Siskiyou	NA	41.34131	-122.53367	EPSG:4326
GH403121	Balfouriana	Siskiyou	NA	41.34131	-122.53367	EPSG:4326
GH403122	Balfouriana	Siskiyou	NA	41.34131	-122.53367	EPSG:4326
UC1452399	Balfouriana	Siskiyou	7100 ft	41.35056	-122.56667	NA
UC1452400	Balfouriana	Siskiyou	6900 ft	41.35480	-122.58070	NA
HSC1381	Balfouriana	Trinity	2134 m	41.35667	-122.56667	NA
JEPS82668	Balfouriana	Siskiyou	8000 ft	41.36097	-122.58963	NAD27
JEPS82670	Balfouriana	Siskiyou	8000 ft	41.36097	-122.58963	NAD27
DS492622	Balfouriana	Siskiyou	NA	41.36930	-122.34980	WGS84
UC55641	Balfouriana	Siskiyou	8000 ft	41.49048	-123.40542	NAD27
UC1272962	Balfouriana	Siskiyou	6900 ft	41.55641	-123.19915	NAD27
UC1362102	Balfouriana	Siskiyou	6900 ft	41.55641	-123.19915	NAD27
CAS511089	Balfouriana	Siskiyou	7000 ft	41.57000	-123.21160	WGS84
DS595422	Balfouriana	Siskiyou	7000 ft	41.57000	-123.21160	WGS84
SBBG25361	Balfouriana	Siskiyou	7000 ft	41.57000	-123.21160	WGS84
RSA183476	Balfouriana	Siskiyou	2134 m	41.57000	-123.21160	WGS84
CAS271760	Balfouriana	Siskiyou	NA	41.57770	-123.20430	WGS84
UC1452397	Balfouriana	Siskiyou	6880 ft	41.73472	-123.13333	NA
HSC1408	Balfouriana	Trinity	2095 m	41.74833	-123.13333	NA
JEPS80562	Balfouriana	Siskiyou	7000 ft	41.95414	-123.06306	NAD27
JEPS88719	Balfouriana	Siskiyou	7000 ft	41.95414	-123.06306	NAD27
UC1313008	Balfouriana	Siskiyou	7000 ft	41.95414	-123.06306	NAD27

SDSU1570	Balfouriana	Fresno	3048 m	37.25680	-118.86560	NA
SDSU1576	Balfouriana	Fresno	3048 m	37.25680	-118.86560	NA
RSA234452	Balfouriana	Tulare	NA	36.46820	-118.59000	NA
HSC1551	Balfouriana	Tulare	3293 m	36.77160	-118.40370	NA
OBI39937	Balfouriana	Tulare	9000-10000 ft	36.66730	-118.69610	NA
CAS382740	Balfouriana	Fresno	9100 ft	36.77108	-118.55098	NA
DS322556	Balfouriana	Fresno	9100 ft	36.77108	-118.55098	NA
HSC1416	Balfouriana	Trinity	NA	40.94404	-122.89251	NA
SBBG33719	Balfouriana	Siskiyou	7000 ft	41.35520	-122.58810	NA
DS98580	Balfouriana	Tulare	10500 ft	36.61800	-118.66000	NA
JEPS46800	Balfouriana	Inyo	NA	40.37857	-122.27206	NA
CAS388644	Balfouriana	Tulare	11000 ft	36.54470	-118.32040	NA
DS93298	Balfouriana	Tulare	NA	36.45084	-118.59481	NA
CAS586317	Balfouriana	Tulare	9550 ft	35.92718	-118.32505	NA
A246874	Balfouriana	Unknown	NA	36.39930	-118.57150	NA
CAS586321	Balfouriana	Tulare	9300 ft	35.91670	-118.31670	NA
DS17334	Balfouriana	Siskiyou	NA			NA
DS689475	Balfouriana	Tulare	NA	36.52770	-118.47810	NA
UC1713757	Balfouriana	Siskiyou	NA	41.33154	-122.55169	NA
DS250875	Balfouriana	Tulare	9600 ft	38.52600	-119.91200	NA
RSA384277	Balfouriana	Fresno	3049 m	36.77360	-118.37670	NA
CAS877760	Balfouriana	Tulare	10000-11000 ft	36.31000	-118.29000	NA
SJSU7472	Balfouriana	Fresno	9400 ft	36.76000	-118.41300	NA
LA86572	Balfouriana	Siskiyou	7000.0 ft	41.57690	-123.20600	NA
CAS372774	Balfouriana	Tulare	11500 ft	36.39945	-118.55521	NA
CAS563033	Balfouriana	Tulare	7800 ft	36.45251	-118.59680	NA
CAS361607	Balfouriana	Tulare	9500 ft	36.21921	-118.17373	NA
A246860	Balfouriana	Unknown	NA	41.27333	-122.40139	NA
GH246863	Balfouriana	Unknown	NA	36.70800	-118.48600	NA

DS61217	Balfouriana	Inyo	9000 ft	36.38949	-118.56860	NA
UC721648	Balfouriana	Tulare	10300 ft	37.14440	-118.55520	NA
RSA231936	Balfouriana	Tulare	2820 m	36.29990	-118.25930	NA
CAS586323	Balfouriana	Tulare	9250 ft	36.29990	-118.25930	NA
CAS476512	Balfouriana	Siskiyou	NA	41.56861	-123.21133	NA
RSA184682	Balfouriana	Siskiyou	2134 m	41.56861	-123.21133	NA
CAS577022	Balfouriana	Tulare	11250 ft	36.31400	-118.28790	NA
GH246862	Balfouriana	Tulare	NA	36.26420	-118.55310	NA
RSA60092	Balfouriana	Tulare	2927 m	36.26420	-118.55310	NA
CAS366470	Balfouriana	Tulare	9600 ft	36.26420	-118.55310	NA
CAS146745	Balfouriana	Fresno	11000 ft	36.77050	-118.41160	NA
DS61214	Balfouriana	Tulare	10589 ft	36.40800	-118.57210	NA
DS337914	Balfouriana	Tulare	9600 ft	36.26420	-118.55310	NA
RSA215637	Balfouriana	Siskiyou	2287 m	38.44800	-119.68150	NA
CAS690610	Balfouriana	Siskiyou	7300 ft	38.44800	-119.68150	NA
CAS577020	Balfouriana	Tulare	9800 ft	36.35492	-118.26810	NA
CAS586322	Balfouriana	Tulare	9800 ft	36.35492	-118.26810	NA
DS160173	Balfouriana	Siskiyou	7500 ft	40.91040	-122.88110	NA
A246859	Balfouriana	Unknown	NA	41.26280	-122.72240	NA
A354520	Balfouriana	Unknown	NA	41.26280	-122.72240	NA
GH246867	Balfouriana	Unknown	NA	41.26280	-122.72240	NA
A246854	Balfouriana	Unknown	NA	41.26280	-122.72240	NA
A354523	Balfouriana	Unknown	NA	41.26280	-122.72240	NA
DS689476	Balfouriana	Tulare	9500 ft	36.46152	-118.46088	NA
CAS672792	Balfouriana	Tulare	9300 ft	35.92718	-118.32505	NA
DS301859	Balfouriana	Tulare	8000 ft	36.39935	-118.57145	NA
SEINET3304671	Balfouriana	Tulare	11000 ft	36.59080	-118.66310	NA
SEINET3304672	Balfouriana	Tulare	11000 ft	36.59080	-118.66310	NA
DS316021	Balfouriana	Tulare	10000 ft	36.41530	-118.60600	NA

DS309942	Balfouriana	Tulare	10300 ft	37.14440	-118.55520	NA
OBI7592	Balfouriana	Tulare	NA	36.48630	-118.56560	NA
GH246869	Balfouriana	Tulare	NA	37.14440	-118.55520	NA
GH246868	Balfouriana	Unknown	NA	41.26280	-122.72240	NA
CAS576337	Balfouriana	Tulare	9500 ft	35.92718	-118.32505	NA
CAS577184	Balfouriana	Tulare	9400 ft	35.91670	-118.31670	NA
CAS576341	Balfouriana	Tulare	9000 ft	35.89820	-118.33670	NA
CAS409573	Balfouriana	Fresno	9900 ft	36.95950	-118.46350	NA
DS134683	Balfouriana	Fresno	10000 ft	36.86900	-118.42950	NA
A246865	Balfouriana	Unknown	NA	36.77390	-118.33200	NA
DS61216	Balfouriana	Tulare	NA	36.54670	-119.01010	NA
DS286	Balfouriana	Siskiyou	8000 ft	41.25900	-122.78100	NA
CAS586320	Balfouriana	Tulare	11510 ft	36.30800	-118.28700	NA
CAS463792	Balfouriana	Siskiyou	NA	41.57870	-123.09200	NA
CAS471121	Balfouriana	Tulare	9900 ft	35.92390	-118.33430	NA
CAS586318	Balfouriana	Tulare	9900 ft	35.92390	-118.33430	NA
CAS300242	Balfouriana	Tulare	11500 ft	36.51160	-118.48400	NA
CAS584583	Balfouriana	Tulare	11700 ft	36.47730	-118.26230	NA
A246856	Balfouriana	Unknown	NA	41.25900	-122.78100	NA
DS61215	Balfouriana	Siskiyou	NA	41.25900	-122.78100	NA
CAS402303	Balfouriana	Fresno	10400 ft	36.86670	-118.52020	NA
SFV14172	Balfouriana	Inyo	3018 m	36.56910	-118.26130	NA
RSA601209	Austrina	Tulare	2896 m	35.92570	-118.33360	NA
RSA384296	Balfouriana	Fresno	3049 m	36.79310	-118.58250	NA

Appendix 2A: Maxent Results for Present Day

Species	#Training samples	Regularized training gain	Unregularized training gain	Iterations	Training AUC	#Test samples	Test gain	Test AUC	AUC Standard Deviation
austrina_0	76	4.3244	4.4618	500	0.9953	25	4.5396	0.9953	0.0007
austrina_1	76	4.1412	4.3599	500	0.9951	25	4.2905	0.9939	0.0008
austrina_2	76	4.1081	4.2781	500	0.9938	25	3.9683	0.9902	0.0038
austrina_3	76	4.1248	4.2635	500	0.9936	25	4.1619	0.9906	0.0047
austrina_4	76	4.2209	4.3947	500	0.9952	25	4.2133	0.9921	0.004
austrina_5	76	4.1497	4.343	500	0.9951	25	3.8522	0.9804	0.0133
austrina_6	76	4.0242	4.2502	500	0.9946	25	4.4804	0.9958	0.0007
austrina_7	76	4.0242	4.2295	500	0.9937	25	4.1225	0.9931	0.0024
austrina_8	76	4.1308	4.3265	500	0.995	25	4.2442	0.9944	0.0009
austrina_9	76	4.2204	4.3818	500	0.995	25	3.9028	0.9921	0.0017
austrina_10	76	4.2244	4.3855	500	0.9949	25	4.4792	0.995	0.0007
austrina_11	76	4.0822	4.2821	500	0.9942	25	3.9569	0.9922	0.002
austrina_12	76	4.2222	4.4044	500	0.9953	25	4.3205	0.9945	0.0009
austrina_13	76	4.2681	4.4341	500	0.9953	25	3.626	0.9816	0.0091
austrina_14	76	4.1695	4.3205	500	0.994	25	4.1943	0.9939	0.001

austrina_15	76	4.2193	4.358	500	0.9949	25	4.1302	0.9838	0.0118
austrina_16	76	4.269	4.3987	500	0.9952	25	4.4207	0.9947	0.0008
austrina_17	76	4.2366	4.3937	500	0.9943	25	4.4872	0.9959	0.0008
austrina_18	76	4.0858	4.2474	500	0.9934	25	4.3712	0.995	0.0013
austrina_19	76	4.3622	4.4916	500	0.9954	25	4.5576	0.9958	0.0007
austrina_20	76	4.1954	4.3379	500	0.9946	25	4.3064	0.9948	0.0009
austrina_21	76	3.9507	4.2107	420	0.9942	25	4.2326	0.9941	0.0009
austrina_22	76	4.25	4.3996	500	0.9944	25	4.3835	0.9955	0.0009
austrina_23	76	4.172	4.3361	500	0.995	25	4.2473	0.9945	0.0009
austrina_24	76	4.151	4.3619	500	0.9951	25	4.435	0.9955	0.0008
austrina_25	76	4.2113	4.3908	500	0.9952	25	4.406	0.9954	0.0008
austrina_26	76	4.1437	4.307	500	0.9949	25	4.4644	0.9954	0.0007
austrina_27	76	4.2366	4.4295	500	0.9952	25	4.4685	0.9953	0.0008
austrina_28	76	4.1177	4.3295	500	0.9951	25	4.3887	0.9949	0.0008
austrina_29	76	3.995	4.2562	500	0.9943	25	4.2922	0.9944	0.001
austrina_30	76	4.1897	4.3541	500	0.9939	25	4.4214	0.995	0.0008
austrina_31	76	4.1432	4.3427	500	0.995	25	4.4898	0.996	0.0007
austrina_32	76	4.2781	4.415	500	0.9952	25	4.477	0.9949	0.0008
austrina_33	76	4.1086	4.3101	500	0.9937	25	4.259	0.9943	0.0009
austrina_34	76	4.0023	4.273	500	0.9949	25	4.1041	0.9937	0.0014
austrina_35	76	4.11	4.3062	500	0.9938	25	4.1839	0.994	0.001
austrina_36	76	4.1833	4.3827	500	0.9952	25	4.1498	0.9932	0.0009
austrina_37	76	4.2063	4.3394	500	0.995	25	4.3625	0.9951	0.0009
austrina_38	76	4.3469	4.4717	500	0.9954	25	3.7599	0.9769	0.0164
austrina_39	76	4.0347	4.2898	500	0.994	25	4.433	0.9954	0.0008
austrina_40	76	4.2213	4.4071	500	0.9953	25	3.8174	0.9882	0.0056
austrina_41	76	4.0894	4.2963	500	0.9942	25	3.9055	0.9906	0.0034
austrina_42	76	4.2995	4.4226	500	0.9952	25	4.1814	0.9943	0.001
austrina_43	76	4.2365	4.3691	500	0.9951	25	4.3025	0.9951	0.0009

austrina_44	76	4.1604	4.3734	500	0.9952	25	4.3523	0.9946	0.0008
austrina_45	76	4.1409	4.3268	500	0.9951	25	3.8842	0.9856	0.0082
austrina_46	76	4.2055	4.4098	500	0.9952	25	4.408	0.9951	0.0008
austrina_47	76	4.1901	4.3798	500	0.9951	25	4.2927	0.9945	0.0009
austrina_48	76	4.0813	4.2978	500	0.994	25	4.2756	0.9947	0.0009
austrina_49	76	4.0883	4.2825	500	0.9941	25	4.1658	0.9933	0.0009
austrina_50	76	4.3684	4.5003	500	0.9954	25	4.098	0.9944	0.0011
austrina_51	76	4.3516	4.4948	500	0.9954	25	4.3467	0.9951	0.001
austrina_52	76	4.1771	4.3186	500	0.9948	25	3.9655	0.9846	0.0105
austrina_53	76	4.2036	4.3813	500	0.9951	25	4.127	0.994	0.0011
austrina_54	76	4.074	4.3014	500	0.9942	25	4.1552	0.992	0.0031
austrina_55	76	4.1686	4.3155	500	0.9931	25	4.378	0.9953	0.0009
austrina_56	76	4.0944	4.2934	500	0.994	25	4.0528	0.9931	0.0011
austrina_57	76	4.2178	4.3997	500	0.9952	25	4.4808	0.9951	0.0007
austrina_58	76	4.3014	4.441	500	0.9953	25	4.5819	0.9959	0.0007
austrina_59	76	4.1848	4.3589	500	0.9951	25	4.3296	0.9943	0.0008
austrina_60	76	4.1312	4.3465	500	0.9945	25	4.307	0.9945	0.0009
austrina_61	76	4.2446	4.3909	500	0.9944	25	4.2727	0.9944	0.0009
austrina_62	76	4.1591	4.3101	500	0.9938	25	4.1754	0.9898	0.0058
austrina_63	76	4.1285	4.3333	500	0.9951	25	4.4333	0.9953	0.0008
austrina_64	76	4.1955	4.3773	500	0.9952	25	4.0267	0.9871	0.0076
austrina_65	76	4.1818	4.3266	500	0.9934	25	4.0275	0.9934	0.0014
austrina_66	76	4.1264	4.2817	500	0.9936	25	4.4819	0.9955	0.0007
austrina_67	76	4.1335	4.2899	500	0.9944	25	4.4022	0.9951	0.0008
austrina_68	76	4.2259	4.393	500	0.9951	25	4.0718	0.986	0.0089
austrina_69	76	3.9436	4.2464	500	0.9947	25	4.4495	0.9959	0.0008
austrina_70	76	4.0577	4.2576	500	0.9936	25	4.2566	0.9919	0.0042
austrina_71	76	4.2114	4.3436	500	0.9947	25	4.4206	0.9947	0.0008
austrina_72	76	4.202	4.4027	500	0.9953	25	4.3285	0.994	0.0008

austrina_73	76	4.2085	4.3729	500	0.9948	25	4.3505	0.9952	0.0009
austrina_74	76	4.1642	4.3516	500	0.9951	25	4.0147	0.9846	0.01
austrina_75	76	4.0925	4.3378	500	0.9947	25	4.1247	0.9929	0.002
austrina_76	76	4.1431	4.3488	500	0.9951	25	4.3094	0.9949	0.0009
austrina_77	76	4.042	4.255	500	0.9939	25	4.319	0.9949	0.0009
austrina_78	76	4.1258	4.3265	500	0.9945	25	4.3021	0.9952	0.0009
austrina_79	76	4.194	4.3881	500	0.9952	25	4.5362	0.9959	0.0007
austrina_80	76	4.2817	4.4092	500	0.9949	25	3.9508	0.9928	0.0018
austrina_81	76	4.0915	4.3218	500	0.9944	25	3.7821	0.9886	0.004
austrina_82	76	4.1722	4.3352	500	0.9944	25	4.1964	0.9944	0.0011
austrina_83	76	4.1355	4.3256	500	0.9941	25	4.1525	0.9923	0.0035
austrina_84	76	4.0555	4.2799	500	0.9944	25	4.3612	0.9952	0.0008
austrina_85	76	3.9287	4.1842	500	0.9945	25	4.3842	0.9953	0.0009
austrina_86	76	4.208	4.3876	500	0.9951	25	4.3428	0.9943	0.0008
austrina_87	76	4.0827	4.3051	500	0.9947	25	4.3663	0.9949	0.0008
austrina_88	76	4.1325	4.3027	500	0.9949	25	4.3884	0.9953	0.0009
austrina_89	76	4.2514	4.4073	500	0.9951	25	4.3285	0.9949	0.0009
austrina_90	76	4.2165	4.4112	500	0.9953	25	4.368	0.9946	0.0008
austrina_91	76	4.1304	4.2928	500	0.9933	25	3.9045	0.9838	0.0076
austrina_92	76	4.1298	4.3361	500	0.995	25	4.5011	0.996	0.0007
austrina_93	76	4.3651	4.4909	500	0.9954	25	3.8134	0.9772	0.017
austrina_94	76	4.0267	4.2797	500	0.9949	25	4.1661	0.9942	0.0011
austrina_95	76	4.0688	4.2896	500	0.9947	25	4.1103	0.9903	0.0044
austrina_96	76	4.1708	4.322	500	0.9942	25	4.2061	0.9938	0.0009
austrina_97	76	3.9895	4.245	500	0.9943	25	4.3365	0.9954	0.0008
austrina_98	76	4.1588	4.3471	500	0.9951	25	4.4873	0.9956	0.0007
austrina_99	76	4.1936	4.3268	500	0.9932	25	3.7911	0.9834	0.0108
austrina (average)	76	4.1619	4.345	499.2	0.9947	25	4.2423	0.9928	0.0025

balfouriana_0	37	4.8017	5.0239	500	0.9975	12	5.1696	0.9981	0.0006
balfouriana_1	37	4.7405	4.9456	500	0.9975	12	5.4514	0.9988	0.0004
balfouriana_2	37	4.5523	4.7712	500	0.9964	12	4.7546	0.9969	0.0007
balfouriana_3	37	4.7288	4.9479	500	0.997	12	4.7693	0.997	0.0006
balfouriana_4	37	4.7418	4.9526	500	0.997	12	4.403	0.9959	0.0011
balfouriana_5	37	4.7233	4.9257	500	0.9974	12	4.8796	0.9973	0.0006
balfouriana_6	37	4.5105	4.7504	500	0.9967	12	4.6607	0.9967	0.0007
balfouriana_7	37	4.7688	4.9792	500	0.9976	12	4.7247	0.9969	0.0007
balfouriana_8	37	4.4658	4.7313	500	0.9966	12	4.522	0.9952	0.0023
balfouriana_9	37	4.4749	4.7152	500	0.9967	12	4.8455	0.9961	0.0026
balfouriana_10	37	4.8556	5.0963	500	0.9978	12	4.6242	0.9936	0.0046
balfouriana_11	37	4.7207	4.9504	500	0.9975	12	5.3436	0.9984	0.0005
balfouriana_12	37	4.591	4.8316	500	0.9972	12	3.4358	0.9894	0.0042
balfouriana_13	37	4.6009	4.8335	500	0.9969	12	4.9132	0.9976	0.0006
balfouriana_14	37	4.7075	4.9139	500	0.9968	12	4.6914	0.9969	0.0008
balfouriana_15	37	4.6678	4.8724	500	0.9967	12	4.9793	0.9976	0.0006
balfouriana_16	37	4.5142	4.7438	500	0.9963	12	5.2388	0.9984	0.0005
balfouriana_17	37	4.5351	4.753	500	0.9964	12	4.8588	0.9975	0.0006
balfouriana_18	37	4.8719	5.0753	500	0.9977	12	4.9916	0.9974	0.0006
balfouriana_19	37	4.8373	5.0653	500	0.9978	12	4.6349	0.9939	0.0043
balfouriana_20	37	4.9001	5.1147	500	0.9978	12	4.555	0.9934	0.0043
balfouriana_21	37	4.627	4.8371	500	0.9968	12	4.8857	0.997	0.0005
balfouriana_22	37	4.4471	4.7541	500	0.997	12	4.9903	0.9975	0.0008
balfouriana_23	37	4.6503	4.8702	500	0.9972	12	5.096	0.9978	0.0005
balfouriana_24	37	4.6112	4.8217	500	0.9965	12	4.1031	0.9951	0.001
balfouriana_25	37	4.5693	4.7744	500	0.9966	12	4.9751	0.9974	0.0005
balfouriana_26	37	4.4288	4.6833	500	0.9964	12	4.8626	0.9974	0.0006
balfouriana_27	37	4.5022	4.7351	500	0.9961	12	4.7166	0.9969	0.0006
balfouriana_28	37	4.4193	4.6672	500	0.9963	12	4.4589	0.9947	0.0025

balfouriana_29	37	4.887	5.1047	500	0.9976	12	4.6662	0.9967	0.0009
balfouriana_30	37	4.6316	4.8497	500	0.9967	12	4.7595	0.997	0.0007
balfouriana_31	37	4.7233	5.0113	500	0.9975	12	5.3509	0.9986	0.0004
balfouriana_32	37	4.6273	4.8692	500	0.9967	12	5.0707	0.9981	0.0005
balfouriana_33	37	4.7647	4.9616	500	0.9976	12	5.0849	0.9977	0.0006
balfouriana_34	37	4.6709	4.8966	500	0.9967	12	4.8653	0.997	0.0012
balfouriana_35	37	4.7903	5.0049	500	0.9976	12	5.028	0.9978	0.0006
balfouriana_36	37	4.4653	4.6777	500	0.9962	12	5.1334	0.9983	0.0004
balfouriana_37	37	4.4045	4.676	500	0.9964	12	4.7673	0.9971	0.0006
balfouriana_38	37	4.5417	4.8002	500	0.997	12	5.2133	0.9981	0.0005
balfouriana_39	37	4.7597	4.9626	500	0.9976	12	5.2017	0.998	0.0005
balfouriana_40	37	4.5819	4.7921	500	0.9964	12	4.4801	0.9942	0.0029
balfouriana_41	37	4.7277	4.9306	500	0.9969	12	4.4636	0.9943	0.003
balfouriana_42	37	4.6365	4.8592	500	0.9968	12	4.2104	0.9938	0.0029
balfouriana_43	37	4.551	4.7864	500	0.9965	12	3.8952	0.9927	0.0029
balfouriana_44	37	4.5184	4.7671	500	0.9967	12	5.0181	0.9976	0.0005
balfouriana_45	37	4.8488	5.0794	500	0.9978	12	4.7012	0.9964	0.0014
balfouriana_46	37	4.5976	4.7898	500	0.9966	12	4.9803	0.9977	0.0006
balfouriana_47	37	4.5199	4.7617	500	0.9963	12	5.0848	0.9979	0.0006
balfouriana_48	37	4.6975	4.9111	500	0.9975	12	5.0707	0.9978	0.0006
balfouriana_49	37	4.635	4.8553	500	0.9968	12	5.0081	0.9976	0.0006
balfouriana_50	37	4.4345	4.6991	500	0.997	12	4.5622	0.9965	0.001
balfouriana_51	37	4.5295	4.7952	500	0.997	12	4.8889	0.9973	0.0006
balfouriana_52	37	4.7556	4.9769	500	0.9975	12	4.7202	0.9962	0.0015
balfouriana_53	37	4.3034	4.605	500	0.996	12	4.4086	0.9961	0.0009
balfouriana_54	37	4.7155	4.9398	500	0.9972	12	4.5545	0.9966	0.0009
balfouriana_55	37	4.8929	5.1239	500	0.9979	12	4.9346	0.9973	0.0007
balfouriana_56	37	4.5337	4.7448	500	0.9966	12	4.7677	0.9966	0.0013
balfouriana_57	37	4.4665	4.7014	500	0.9961	12	4.4124	0.9934	0.0033

balfouriana_58	37	4.5763	4.7951	500	0.9967	12	5.1054	0.9979	0.0005
balfouriana_59	37	4.4714	4.7142	500	0.9963	12	5.1293	0.9981	0.0005
balfouriana_60	37	4.4673	4.6854	500	0.9964	12	4.6568	0.9959	0.0018
balfouriana_61	37	4.5313	4.7723	500	0.9967	12	5.0002	0.9979	0.0006
balfouriana_62	37	4.575	4.762	500	0.9963	12	4.9902	0.9975	0.0005
balfouriana_63	37	4.6353	4.8604	500	0.9966	12	4.0486	0.9932	0.0028
balfouriana_64	37	4.7361	4.9632	500	0.9973	12	4.8291	0.9971	0.0009
balfouriana_65	37	4.8603	5.0498	500	0.9978	12	4.4074	0.9959	0.0013
balfouriana_66	37	4.7243	4.9244	500	0.9975	12	4.7271	0.997	0.0007
balfouriana_67	37	4.6721	4.9187	500	0.9973	12	4.3326	0.9936	0.0034
balfouriana_68	37	4.8871	5.1219	500	0.9978	12	4.1625	0.9913	0.0058
balfouriana_69	37	4.6145	4.8406	500	0.9973	12	4.7295	0.9968	0.0007
balfouriana_70	37	4.6947	4.9558	500	0.9973	12	4.663	0.9966	0.0013
balfouriana_71	37	4.7585	4.9874	500	0.9976	12	4.8669	0.9973	0.0007
balfouriana_72	37	4.5239	4.7392	500	0.9964	12	4.6401	0.9969	0.0007
balfouriana_73	37	4.444	4.728	500	0.9965	12	4.9782	0.9977	0.0006
balfouriana_74	37	4.7661	4.9652	500	0.9975	12	4.6647	0.9946	0.0036
balfouriana_75	37	4.7082	4.9529	500	0.9975	12	4.781	0.9972	0.0007
balfouriana_76	37	4.4684	4.7202	500	0.9967	12	4.6158	0.9967	0.0007
balfouriana_77	37	4.7129	4.9482	500	0.9974	12	4.9758	0.9976	0.0006
balfouriana_78	37	4.5205	4.7844	500	0.9969	12	4.8991	0.997	0.0014
balfouriana_79	37	4.7139	4.9421	500	0.9974	12	4.174	0.9928	0.0037
balfouriana_80	37	4.5735	4.7991	500	0.9965	12	4.7948	0.9971	0.0006
balfouriana_81	37	4.5762	4.8249	500	0.9973	12	4.9026	0.9974	0.0006
balfouriana_82	37	4.5146	4.7502	500	0.9966	12	5.0342	0.9978	0.0006
balfouriana_83	37	4.7764	4.9924	500	0.9976	12	3.5816	0.9891	0.0049
balfouriana_84	37	4.5727	4.8075	500	0.9971	12	4.9967	0.9975	0.0005
balfouriana_85	37	4.8199	5.008	500	0.9976	12	4.5345	0.996	0.0014
balfouriana_86	37	4.5171	4.7523	500	0.9967	12	4.5924	0.9958	0.0015

balfouriana_87	37	4.5638	4.8262	500	0.9967	12	5.0382	0.998	0.0005
balfouriana_88	37	4.5981	4.8174	500	0.9965	12	5.2017	0.9982	0.0005
balfouriana_89	37	4.8286	5.0431	500	0.9976	12	4.7085	0.9943	0.0038
balfouriana_90	37	4.4532	4.7107	500	0.9963	12	5.0292	0.9979	0.0006
balfouriana_91	37	4.8051	5.0351	500	0.9975	12	5.2026	0.9982	0.0006
balfouriana_92	37	4.6541	4.8712	500	0.9971	12	4.721	0.9965	0.0013
balfouriana_93	37	4.7533	4.9824	500	0.9975	12	4.3852	0.996	0.0013
balfouriana_94	37	4.7169	4.9364	500	0.9975	12	4.6789	0.9967	0.0007
balfouriana_95	37	4.5493	4.8083	500	0.9967	12	4.5191	0.9966	0.0007
balfouriana_96	37	4.6563	4.8937	500	0.9973	12	4.5116	0.9966	0.0008
balfouriana_97	37	4.552	4.7949	500	0.9967	12	4.3957	0.9945	0.0025
balfouriana_98	37	4.4329	4.6803	500	0.9963	12	4.6005	0.9964	0.001
balfouriana_99	37	4.4144	4.7541	500	0.997	12	4.3567	0.9951	0.0016
balfouriana (average)	37	4.6317	4.8629	500	0.997	12	4.75	0.9964	0.0013

Appendix 2B: Maxent Percent Contribution Scores for Present Day

Background points	Bio1	Bio2	Bio3	Bio4	Bio5	Bio6	Bio7	Bio8	Bio9	Bio10	Bio11	Bio12	Bio13	Bio14	Bio15	Bio16	Bio17	Bio18	Bio19
10076.00	0.57	19.39	0.80	0.00	42.55	8.12	0.03	0.01	0.00	0.00	0.00	1.14	0.00	1.68	5.77	2.24	3.81	0.11	13.77
10076.00	0.29	14.47	2.34	0.00	41.58	8.31	0.00	0.10	0.01	0.01	0.00	1.96	0.19	1.47	10.67	4.16	2.89	0.34	11.20
10076.00	0.01	14.12	3.43	0.00	38.99	6.50	0.15	0.05	0.01	0.99	0.78	1.31	0.07	1.42	11.20	6.75	0.87	0.13	13.22
10076.00	0.14	15.16	3.59	0.00	41.60	5.92	0.00	0.01	0.02	1.10	0.00	1.40	0.05	0.93	8.35	3.17	3.96	1.42	13.15
10076.00	0.00	13.24	1.07	0.00	43.59	7.97	0.00	0.02	0.00	1.84	0.06	1.58	0.89	0.82	8.63	2.46	3.43	0.17	14.25
10076.00	3.24	12.43	3.13	0.00	45.64	5.28	0.49	0.28	0.00	0.00	0.01	1.01	0.01	1.38	14.06	4.97	2.19	0.14	5.75
10076.00	0.99	13.78	5.20	0.00	44.20	3.20	0.00	0.15	0.02	0.00	0.00	0.61	0.00	1.40	8.48	4.91	2.73	0.20	14.11
10076.00	0.00	10.56	4.48	0.00	40.11	5.74	0.08	0.08	0.05	2.39	0.00	1.83	0.00	2.10	13.29	5.78	0.02	1.66	11.84
10076.00	2.07	12.79	3.61	0.00	42.64	5.60	0.00	0.47	0.06	0.49	0.27	2.06	0.00	1.24	11.32	3.62	2.93	0.25	10.60
10076.00	0.80	14.89	1.21	0.00	46.69	7.97	0.00	0.15	0.00	0.01	0.05	1.60	0.03	1.58	8.72	1.53	3.61	0.00	11.16
10076.00	0.03	14.45	1.26	0.00	43.70	8.88	0.00	0.08	0.00	0.00	0.02	2.52	0.08	0.97	9.47	2.61	2.91	0.76	12.26
10076.00	1.18	12.60	4.04	0.01	41.04	6.30	0.00	0.02	0.05	0.00	0.00	0.98	0.00	1.88	10.94	5.31	2.41	0.27	12.97
10076.00	0.00	11.22	2.15	0.00	52.24	2.23	0.00	2.52	0.01	4.17	0.62	1.67	0.00	1.76	11.64	4.47	0.52	0.02	4.75
10076.00	1.21	14.71	0.88	0.00	43.06	8.38	0.00	0.04	0.00	0.00	0.01	2.01	1.00	1.36	7.63	2.47	2.47	0.33	14.45
10076.00	0.01	14.06	1.93	0.01	43.97	6.50	0.23	0.01	0.02	1.05	0.00	3.02	0.07	1.28	8.56	4.57	0.77	0.00	13.95
10076.00	0.00	18.26	0.84	0.00	39.34	9.16	0.00	0.05	0.03	0.00	0.74	2.06	0.04	1.05	7.38	3.50	3.85	0.03	13.66
10076.00	0.88	16.45	0.59	0.00	46.44	6.10	0.14	0.00	0.01	0.94	0.01	1.35	0.01	1.36	3.68	2.16	4.76	0.01	15.12
10076.00	0.09	14.05	2.46	0.00	45.76	3.48	0.00	0.02	0.01	1.64	0.52	1.01	0.41	1.46	7.70	5.79	0.05	0.66	14.87
10076.00	0.00	12.08	3.64	0.00	45.86	4.94	0.00	0.31	0.01	2.78	0.00	1.39	0.82	0.81	9.67	2.47	3.09	0.09	12.06

10076.00	0.86	17.10	0.40	0.00	48.16	6.31	0.00	0.03	0.00	0.91	0.17	0.65	0.91	2.16	4.58	0.58	4.08	0.00	13.11
10076.00	0.06	14.49	2.48	0.00	43.50	6.24	0.00	0.11	0.00	0.65	0.01	2.14	0.02	1.60	9.10	3.97	2.72	0.00	12.91
10076.00	1.58	8.36	5.80	0.00	43.48	2.31	0.00	0.88	0.11	0.99	0.00	0.95	0.00	0.98	13.74	6.01	2.04	0.56	12.21
10076.00	0.27	17.57	1.33	0.00	46.06	7.56	0.00	0.30	0.00	0.00	0.04	1.74	0.05	1.19	5.53	0.79	5.04	0.00	12.54
10076.00	0.46	13.95	1.60	0.00	44.97	8.06	0.00	0.73	0.00	0.00	0.16	1.97	0.09	1.19	8.74	2.86	3.57	0.01	11.63
10076.00	0.57	12.85	2.92	0.00	43.23	6.40	0.00	0.10	0.39	0.00	0.35	1.72	0.15	1.33	10.71	4.74	2.81	0.20	11.54
10076.00	0.00	13.30	1.06	0.00	43.01	8.37	0.00	0.02	0.01	0.89	0.62	2.03	0.00	0.75	10.19	5.00	1.63	0.61	12.49
10076.00	0.00	13.75	1.53	0.00	42.18	8.42	0.00	0.13	0.01	1.55	0.01	1.49	0.09	0.56	10.98	5.42	1.90	0.16	11.83
10076.00	0.04	13.94	1.93	0.00	39.98	7.46	0.20	0.04	0.07	0.00	0.73	4.40	0.00	2.95	10.89	4.24	1.70	0.43	11.00
10076.00	2.42	9.42	2.44	0.00	42.84	6.86	0.00	1.05	0.00	0.01	0.00	2.58	0.06	1.41	14.27	3.20	3.09	0.23	10.11
10076.00	0.82	10.41	4.44	0.00	41.50	5.44	0.08	0.02	0.06	0.00	0.00	1.79	0.11	2.09	12.63	5.70	0.01	1.61	13.30
10076.00	0.18	15.91	1.54	0.00	40.58	8.94	0.00	0.04	0.02	0.00	0.00	1.48	0.01	1.48	8.18	2.66	4.40	0.73	13.85
10076.00	0.02	14.32	1.81	0.00	38.69	8.77	0.00	1.87	0.00	0.36	0.04	1.55	0.14	1.81	10.11	4.87	3.57	0.45	11.62
10076.00	0.11	16.41	0.66	0.00	42.64	8.15	0.00	0.03	0.00	0.93	0.06	1.98	0.00	1.24	6.84	2.96	4.43	0.00	13.56
10076.00	0.58	14.10	3.34	0.00	43.92	5.58	0.00	0.66	0.02	0.00	0.00	1.77	0.37	1.67	9.35	1.98	3.66	0.16	12.86
10076.00	0.68	5.54	5.75	0.03	41.68	2.99	0.00	0.00	0.10	0.84	0.00	1.35	0.61	0.79	7.39	6.82	1.06	1.38	22.99
10076.00	0.93	13.13	1.94	0.00	44.65	6.18	0.00	0.08	0.01	1.65	0.00	0.96	0.02	1.12	9.12	4.04	3.14	0.10	12.93
10076.00	0.00	11.35	3.46	0.00	48.36	5.49	0.00	0.15	0.00	1.15	0.04	1.77	0.08	1.31	9.81	3.53	2.51	0.10	10.90
10076.00	0.00	13.77	1.39	0.00	45.04	7.16	0.00	0.05	0.00	2.42	0.01	0.96	0.03	0.90	8.01	2.30	3.87	0.14	13.95
10076.00	0.21	17.17	0.78	0.00	44.85	7.02	0.00	0.03	0.00	1.10	0.00	1.65	0.00	1.29	4.84	2.00	4.31	0.38	14.37
10076.00	0.59	9.81	4.80	0.00	43.50	5.74	0.53	0.34	0.06	0.00	0.00	2.10	0.00	1.40	13.17	3.08	3.36	0.61	10.88
10076.00	0.00	11.56	2.70	0.00	45.67	6.66	0.20	0.04	0.00	1.81	0.09	0.73	0.07	1.70	8.04	2.91	2.95	0.32	14.56
10076.00	0.96	11.55	2.37	0.00	51.09	5.72	0.32	0.10	0.01	0.00	0.01	0.47	0.04	1.18	9.01	3.15	2.65	0.10	11.28
10076.00	0.00	14.44	1.12	0.00	44.52	6.63	0.00	0.00	0.00	4.22	0.21	0.92	0.01	1.04	6.30	3.01	2.73	0.00	14.84
10076.00	1.09	13.86	1.17	0.00	48.65	6.66	0.00	0.02	0.00	1.02	0.04	1.30	0.94	1.56	7.30	1.43	2.87	0.08	12.02
10076.00	0.00	7.24	3.45	0.00	48.32	4.99	0.00	0.14	0.00	3.23	0.05	1.49	0.06	2.11	16.23	4.44	0.80	1.65	5.78
10076.00	1.87	7.02	1.95	0.00	46.26	6.88	0.00	0.87	0.04	1.58	0.03	2.25	0.00	1.37	17.78	4.12	1.60	0.40	5.98
10076.00	0.39	15.23	1.60	0.00	42.29	10.07	0.09	0.82	0.01	0.00	0.00	2.55	1.63	1.76	14.07	1.77	2.40	0.17	5.16
10076.00	0.31	13.81	1.61	0.00	41.43	8.20	0.00	0.63	0.00	0.00	0.40	1.81	0.04	0.84	9.55	4.34	3.06	0.17	13.81

10076.00	0.41	14.73	3.46	0.00	43.76	5.79	0.00	0.15	0.01	0.01	0.01	1.75	0.03	1.02	9.80	3.96	2.96	0.12	12.01
10076.00	1.19	11.21	2.00	0.03	47.69	5.42	0.00	0.86	0.03	1.02	0.01	1.68	0.01	1.59	10.50	4.06	1.22	0.21	11.27
10076.00	0.02	15.00	0.41	0.00	48.22	7.25	0.00	0.04	0.00	2.39	0.16	1.22	0.00	0.67	5.99	1.80	2.57	0.00	14.24
10076.00	0.02	20.54	0.74	0.00	40.55	8.41	0.00	0.25	0.00	0.00	0.02	2.05	0.00	1.63	4.65	1.55	5.65	0.00	13.94
10076.00	0.00	13.63	2.26	0.00	46.07	5.69	0.00	0.10	0.01	0.82	0.42	1.23	0.35	0.85	9.02	3.81	2.97	0.08	12.70
10076.00	0.00	13.30	2.41	0.00	45.47	5.94	0.00	0.08	0.00	1.96	0.37	1.51	0.10	0.89	7.99	4.01	2.98	0.15	12.84
10076.00	0.49	9.61	4.15	0.00	45.16	5.96	0.00	0.36	0.03	0.00	0.00	1.71	0.00	1.52	12.55	3.79	2.90	0.48	11.29
10076.00	0.41	18.12	1.45	0.01	42.96	8.03	0.00	0.03	0.01	0.00	0.00	0.83	0.27	1.15	6.25	2.62	4.35	0.70	12.79
10076.00	0.00	8.78	3.41	0.00	46.24	5.01	0.00	2.06	0.05	1.16	0.01	1.56	0.11	1.68	12.29	4.80	0.63	1.19	11.03
10076.00	0.59	12.06	2.21	0.00	47.21	5.22	0.00	0.09	0.00	3.28	0.05	1.03	1.31	1.07	8.76	0.92	3.72	0.42	12.06
10076.00	0.00	17.45	0.64	0.00	40.93	8.90	0.00	0.05	0.01	0.60	0.08	1.30	0.82	2.08	8.14	2.29	2.79	0.86	13.07
10076.00	0.00	13.58	1.30	0.00	43.23	7.15	0.00	0.06	0.05	3.33	0.04	0.92	0.00	1.02	9.02	4.25	2.31	0.56	13.18
10076.00	0.00	12.09	3.61	0.00	46.07	4.93	0.00	0.03	0.00	2.55	0.23	1.76	0.07	0.76	8.64	2.51	3.46	0.21	13.07
10076.00	0.62	17.76	1.02	0.00	45.37	7.49	0.00	0.26	0.01	0.00	0.03	1.12	0.01	0.98	5.88	3.27	3.25	0.00	12.93
10076.00	0.00	12.95	1.38	0.00	46.41	6.07	0.00	0.81	0.00	3.27	0.00	1.05	0.01	1.11	7.67	3.00	2.53	0.13	13.61
10076.00	0.74	11.48	2.13	0.01	45.04	6.48	0.00	0.15	0.00	1.69	0.00	0.66	0.12	1.20	10.50	5.43	1.66	0.23	12.48
10076.00	0.00	13.78	1.27	0.00	43.00	8.67	0.00	0.79	0.00	0.92	0.01	2.19	1.17	2.01	9.50	2.65	1.19	0.21	12.63
10076.00	1.08	16.37	2.57	0.01	47.78	5.16	0.00	0.02	0.00	0.00	0.00	0.85	0.03	1.02	6.32	3.33	2.80	0.06	12.60
10076.00	1.23	15.61	1.99	0.02	41.56	7.31	0.00	0.05	0.06	0.00	0.00	1.40	0.00	0.73	8.57	2.19	4.79	0.89	13.60
10076.00	0.00	13.31	2.06	0.00	43.75	6.55	0.00	0.00	0.02	1.63	0.40	1.16	0.20	0.73	6.86	3.78	3.65	0.10	15.80
10076.00	0.71	14.22	1.12	0.00	44.71	8.38	0.00	0.69	0.00	0.00	0.03	2.51	0.00	1.63	8.29	2.42	2.91	0.17	12.22
10076.00	0.09	5.99	8.54	0.00	44.98	0.13	0.00	2.51	0.03	1.31	0.00	1.26	0.00	1.23	14.36	5.77	1.19	0.66	11.95
10076.00	0.73	10.85	3.67	0.00	45.91	4.66	0.16	0.05	0.09	1.55	0.00	2.06	0.00	1.48	10.27	3.33	3.31	0.63	11.26
10076.00	0.00	10.87	1.38	0.00	48.21	6.54	0.13	0.09	0.00	3.14	0.23	1.36	0.02	0.88	8.44	2.67	2.90	0.12	12.99
10076.00	0.81	12.82	1.18	0.00	45.90	8.19	0.00	0.12	0.00	0.00	0.08	2.51	1.70	1.04	9.77	1.59	1.83	0.77	11.70
10076.00	0.28	17.49	1.62	0.00	41.63	8.91	0.00	0.10	0.05	0.00	0.00	1.84	0.07	1.65	8.27	3.98	2.52	0.27	11.32
10076.00	0.22	15.47	1.40	0.00	40.14	9.58	0.00	0.11	0.00	0.03	0.01	2.75	0.77	0.80	10.22	2.06	3.75	0.22	12.47
10076.00	0.00	9.86	2.74	0.00	46.89	6.40	0.23	0.03	0.00	1.49	0.23	0.86	0.10	0.91	9.59	4.62	1.65	0.62	13.77
10076.00	0.24	12.73	2.24	0.00	40.93	9.05	0.00	0.73	0.02	0.00	0.00	1.75	1.88	1.13	10.98	1.94	3.32	1.52	11.55

10076.00	0.43	11.32	3.43	0.00	45.45	6.77	0.00	1.06	0.01	1.20	0.01	0.81	0.84	0.74	10.92	0.76	4.32	0.79	11.14
10076.00	1.43	13.06	2.52	0.00	43.45	6.49	0.00	0.01	0.00	0.06	0.05	1.38	0.56	0.97	7.41	2.92	4.16	0.66	14.87
10076.00	1.37	12.51	0.97	0.00	44.52	7.50	0.00	0.07	0.00	0.00	0.11	0.97	0.08	1.69	8.89	2.35	3.58	0.50	14.88
10076.00	0.92	15.98	0.64	0.00	48.04	7.40	0.36	0.08	0.00	0.00	0.05	1.39	0.00	1.16	6.12	2.25	3.49	0.00	12.14
10076.00	0.00	7.52	2.58	0.00	47.30	6.65	0.23	0.04	0.01	1.21	0.01	2.01	0.07	1.02	13.23	4.45	1.25	0.85	11.59
10076.00	0.56	16.22	1.51	0.00	42.06	7.07	0.00	0.01	0.00	0.00	0.00	1.51	0.10	1.15	5.25	2.48	6.02	0.18	15.88
10076.00	0.01	13.18	1.91	0.00	44.42	6.13	0.00	0.18	0.03	2.99	0.04	2.08	0.00	1.60	9.07	3.76	2.06	0.05	12.51
10076.00	1.85	12.08	4.04	0.03	40.40	4.36	0.00	0.03	0.14	2.03	0.00	1.40	0.00	1.38	11.42	6.67	0.40	0.86	12.89
10076.00	0.92	10.54	7.10	0.00	42.38	3.28	0.14	0.17	0.06	0.04	0.01	0.62	0.01	0.86	12.80	5.31	2.78	0.37	12.62
10076.00	0.30	14.97	0.89	0.00	40.59	9.33	0.58	0.05	0.02	0.00	0.13	1.45	0.00	1.32	9.43	4.28	2.76	0.15	13.74
10076.00	0.00	11.67	4.13	0.03	43.07	4.50	0.00	0.00	0.03	2.60	0.00	1.59	0.19	1.51	9.25	4.68	2.36	0.82	13.58
10076.00	2.10	12.08	2.28	0.00	43.51	6.24	0.00	1.04	0.00	1.48	0.02	0.99	0.01	0.96	11.51	5.26	1.35	0.18	10.98
10076.00	0.00	15.07	1.15	0.00	42.33	8.70	0.01	0.05	0.39	0.00	0.59	2.96	0.02	1.24	8.88	2.43	4.15	0.00	12.03
10076.00	1.43	11.69	1.56	0.00	50.04	7.38	0.30	0.27	0.00	0.04	0.01	1.24	0.00	1.02	9.18	1.05	3.12	0.11	11.57
10076.00	1.39	12.50	3.48	0.00	45.91	4.94	0.00	0.08	0.01	1.69	0.01	1.76	0.00	1.62	9.66	3.76	1.99	0.00	11.21
10076.00	1.10	12.07	2.72	0.00	40.38	7.35	0.00	1.84	0.06	0.00	0.01	1.99	1.72	1.25	11.99	3.88	2.64	0.25	10.76
10076.00	3.87	14.05	0.34	0.00	49.25	3.67	0.00	1.71	0.00	1.03	0.04	0.78	0.00	0.91	5.91	2.09	2.13	0.48	13.74
10076.00	1.03	8.53	4.80	0.04	47.75	3.76	0.01	0.00	0.06	0.26	0.00	1.70	0.06	0.51	9.76	3.50	3.97	0.16	14.10
10076.00	0.45	12.58	3.93	0.00	42.49	5.51	0.00	0.00	0.04	0.00	0.00	1.28	0.10	1.53	9.14	4.47	2.11	1.16	15.22
10076.00	0.00	12.59	1.98	0.00	46.40	5.66	0.00	0.78	0.04	3.22	0.00	0.86	0.04	0.97	7.62	2.39	3.17	0.18	14.10
10076.00	1.02	6.42	5.02	0.00	45.89	4.76	0.19	0.05	0.06	1.53	0.00	1.76	0.07	0.95	13.57	4.39	1.87	0.36	12.08
10076.00	0.43	12.96	2.98	0.00	45.19	7.28	0.00	0.81	0.02	0.01	0.00	1.40	0.19	1.42	11.17	2.46	2.64	1.39	9.65
10076.00	0.00	15.04	2.37	0.04	45.13	4.81	0.00	0.02	0.02	2.37	0.00	0.82	1.45	1.26	7.44	3.95	1.89	0.11	13.27
10076.00	0.57	13.16	2.41	0.00	44.32	6.49	0.05	0.33	0.03	0.97	0.10	1.56	0.24	1.28	9.42	3.47	2.75	0.39	12.48
10036.00	5.37	0.00	3.30	0.00	2.43	7.73	0.00	0.00	4.27	21.02	0.85	0.11	0.00	2.56	0.57	10.15	3.82	0.00	37.83
10037.00	1.92	0.01	4.56	0.23	2.93	9.30	0.00	0.00	3.23	23.65	0.03	0.00	0.03	1.42	0.32	9.68	3.58	0.00	39.10
10037.00	0.97	0.32	5.41	0.04	0.00	11.59	0.00	0.00	0.05	24.19	0.22	0.13	0.00	1.11	0.34	4.95	5.07	0.03	45.58
10035.00	1.32	0.04	3.94	0.50	0.20	8.60	0.00	0.54	3.38	22.83	2.31	0.11	0.00	1.45	0.35	8.00	5.23	0.01	41.21
10036.00	0.70	0.22	5.53	0.00	0.54	11.74	0.00	0.00	1.93	22.79	0.30	0.00	0.00	1.32	0.48	4.86	5.64	0.02	43.94

10036.00	6.49	0.02	4.52	0.15	2.31	5.95	0.09	0.31	1.78	24.28	0.26	0.03	0.04	1.01	0.30	10.61	4.31	0.00	37.54
10037.00	0.26	0.02	4.88	0.06	0.39	9.47	0.00	0.00	1.58	20.65	0.66	0.01	0.00	4.94	0.46	0.00	5.45	0.04	51.12
10037.00	6.07	0.06	4.76	0.09	0.07	3.82	0.00	0.71	3.64	26.95	0.34	0.15	0.00	1.65	0.26	9.45	3.85	0.00	38.14
10037.00	1.75	0.30	5.77	0.47	1.03	9.40	0.00	0.00	0.14	19.74	0.84	0.12	0.00	5.74	0.20	4.30	3.80	0.02	46.38
10037.00	2.35	0.20	3.11	1.79	1.17	9.78	0.00	0.00	0.10	20.98	0.24	0.00	0.03	2.40	0.14	8.68	4.89	0.02	44.11
10035.00	3.43	0.00	3.91	0.01	1.89	10.36	0.00	0.40	1.54	22.20	0.06	0.00	0.00	3.29	0.63	9.48	4.92	0.01	37.85
10034.00	0.99	0.03	4.45	2.49	2.21	8.24	0.00	0.00	0.00	24.47	0.33	0.22	0.00	1.17	0.15	6.65	8.41	0.00	40.19
10037.00	1.16	0.05	4.56	0.79	3.86	8.20	0.02	0.00	0.01	20.46	0.47	0.11	0.00	1.50	0.31	3.77	10.05	0.05	44.63
10036.00	0.47	0.07	5.86	0.02	1.89	7.77	0.00	0.69	0.20	22.61	0.24	0.00	0.00	1.13	0.32	4.45	8.14	0.02	46.11
10037.00	2.65	0.02	3.74	0.07	0.26	8.30	0.00	0.00	1.93	26.36	0.40	0.14	0.00	1.51	0.29	9.43	4.63	0.00	40.28
10036.00	2.33	0.02	3.49	1.87	0.37	8.10	0.00	0.00	2.26	25.78	0.34	0.27	0.00	1.34	0.00	8.90	3.87	0.00	41.05
10037.00	0.62	0.44	3.88	1.17	0.61	11.57	0.00	0.00	0.27	23.91	0.61	0.38	0.00	1.09	0.28	9.09	4.89	0.02	41.19
10037.00	1.80	0.07	5.92	0.11	0.00	10.73	0.00	0.00	0.19	24.08	0.30	0.02	0.00	3.27	0.13	5.24	3.38	0.00	44.75
10036.00	4.96	0.04	5.49	0.04	0.18	8.28	0.00	0.00	0.24	22.49	0.39	0.00	0.00	1.50	0.27	8.41	8.33	0.00	39.35
10036.00	5.21	0.47	2.99	0.12	0.99	6.95	0.00	0.00	4.22	19.58	0.02	0.07	0.00	2.58	0.25	8.55	8.18	0.01	39.79
10033.00	0.99	0.05	5.26	0.10	1.33	9.14	0.00	0.00	1.98	24.32	0.20	0.12	0.00	1.27	0.11	8.08	8.87	0.01	38.15
10036.00	4.64	0.01	5.71	0.01	2.12	9.03	0.18	0.00	0.01	21.13	0.32	0.00	0.03	0.94	0.41	5.38	4.97	0.00	45.10
10035.00	0.27	0.01	6.98	0.06	0.00	10.16	0.00	0.00	1.39	22.32	0.68	0.03	0.00	3.01	0.54	4.60	3.01	0.04	46.92
10037.00	1.15	0.11	2.78	2.08	0.89	7.01	0.08	0.00	1.05	27.71	4.47	1.71	0.00	2.45	0.18	13.44	3.55	0.00	31.32
10037.00	1.41	0.20	4.61	0.30	0.01	8.71	0.14	0.00	1.87	26.37	0.29	0.10	0.03	1.11	0.24	8.62	3.72	0.00	42.28
10037.00	4.95	0.15	4.39	0.11	0.34	8.13	0.59	0.00	0.01	23.83	2.50	0.10	0.04	1.49	0.31	7.52	4.32	0.03	41.21
10036.00	1.12	0.05	8.39	0.20	1.90	12.90	0.00	0.00	0.00	14.44	0.15	0.11	0.01	3.20	0.21	3.65	6.71	0.08	46.88
10037.00	0.64	0.11	3.07	1.25	2.89	9.60	0.00	0.00	1.87	23.28	0.57	0.39	0.03	1.69	0.07	5.05	3.98	0.00	45.52
10037.00	0.90	0.27	3.52	2.38	0.24	7.75	0.00	0.22	0.02	20.36	4.23	0.00	0.00	1.88	0.06	3.66	7.99	0.01	46.50
10036.00	2.05	0.02	3.21	1.21	0.20	8.86	0.00	0.00	3.25	26.48	1.09	0.03	0.00	1.51	0.14	7.22	4.61	0.00	40.15
10036.00	1.14	0.01	3.45	0.01	2.49	6.97	0.00	0.64	0.12	24.60	0.27	0.00	0.02	2.35	0.41	3.72	7.47	0.02	46.30
10036.00	8.55	0.02	3.45	0.84	2.23	4.49	0.06	0.00	0.00	22.68	3.76	0.39	0.06	2.38	0.30	7.28	3.69	0.02	39.80
10033.00	0.73	0.02	6.38	0.00	0.11	9.98	0.00	0.00	1.96	22.91	0.22	0.40	0.00	0.95	0.26	0.00	3.39	1.43	51.28
10037.00	5.43	0.01	4.59	0.07	1.56	6.55	0.04	0.00	1.44	23.37	0.12	0.00	0.00	1.86	0.25	9.65	5.35	0.01	39.69

10035.00	1.21	0.28	4.02	2.60	0.30	10.35	0.00	0.00	0.03	24.88	1.35	0.16	0.00	1.62	0.51	8.50	3.56	0.01	40.61
10036.00	2.03	0.04	3.18	1.73	0.17	9.02	0.00	0.00	3.74	23.58	0.02	0.00	0.02	2.06	0.28	21.18	3.61	1.40	27.95
10036.00	0.65	0.02	4.62	2.49	0.30	12.33	0.04	0.00	0.00	21.70	0.30	0.16	0.00	1.06	0.34	1.74	3.44	1.25	49.57
10036.00	1.19	0.22	5.22	2.80	0.15	14.11	0.00	0.00	0.00	14.94	0.80	0.09	0.01	1.13	0.07	1.47	7.76	0.02	50.03
10037.00	1.34	0.11	4.84	2.58	0.43	11.47	0.00	0.00	0.03	23.68	0.22	0.16	0.25	1.86	0.47	6.70	3.22	0.01	42.62
10036.00	2.87	0.00	5.54	0.43	1.42	7.58	0.00	0.00	0.10	22.88	0.32	0.21	0.05	1.07	0.03	7.83	8.49	0.72	40.47
10036.00	0.84	0.04	5.38	2.93	0.07	10.79	0.04	0.00	0.00	18.49	0.50	1.64	0.20	5.17	0.17	2.08	4.93	0.92	45.81
10036.00	0.29	0.03	1.64	0.23	2.57	7.11	0.00	0.00	1.76	24.19	2.62	0.10	0.00	2.98	0.13	3.74	7.63	0.00	44.97
10035.00	0.95	0.06	4.91	0.44	0.09	9.73	0.00	0.00	2.33	20.79	1.29	0.10	0.08	1.37	0.13	4.49	7.75	0.00	45.48
10037.00	0.82	0.05	4.67	0.79	0.39	10.81	0.00	0.00	0.00	25.06	0.30	0.00	0.14	0.90	0.40	5.07	5.27	0.02	45.31
10037.00	1.65	0.25	4.99	0.80	0.13	10.80	0.00	0.00	0.02	20.54	0.40	0.00	0.00	1.01	0.22	4.91	8.20	0.03	46.04
10034.00	6.04	0.00	2.83	2.71	0.25	5.29	0.00	0.00	2.01	26.94	0.12	0.13	0.00	1.84	0.08	23.93	3.81	0.00	24.00
10036.00	1.59	0.10	4.08	2.34	0.28	10.64	0.36	0.00	0.14	17.39	0.99	0.15	0.02	0.90	0.06	7.09	9.23	1.14	43.50
10036.00	1.08	0.06	4.84	0.39	0.05	10.21	0.04	0.00	0.44	25.17	0.16	0.01	0.01	3.36	0.46	4.81	2.64	0.01	46.28
10037.00	2.60	0.05	3.73	2.27	0.31	8.26	0.00	0.00	0.06	23.15	0.07	0.00	0.01	1.52	0.27	8.11	7.91	0.85	40.83
10035.00	2.18	0.09	5.92	0.80	1.79	9.59	0.00	0.00	0.19	23.47	0.13	0.12	0.00	0.97	0.06	8.24	3.91	0.01	42.54
10037.00	1.08	0.01	6.49	0.04	0.84	11.51	0.00	0.00	0.02	15.72	0.71	0.00	0.09	5.41	0.42	0.00	4.25	0.02	53.40
10037.00	0.67	0.02	4.13	0.54	0.18	11.28	0.00	0.00	0.00	19.72	0.23	0.04	0.00	3.01	0.67	5.05	8.20	0.11	46.16
10037.00	2.83	0.00	3.13	0.40	2.60	7.53	0.04	0.00	2.18	21.87	0.80	0.32	0.02	1.74	0.07	8.46	4.07	2.62	41.31
10036.00	1.39	0.07	4.68	0.09	0.06	11.30	0.00	0.56	0.02	22.42	1.49	0.09	0.05	1.85	0.82	0.00	3.08	0.04	51.98
10036.00	2.01	0.27	3.74	0.18	3.41	9.68	0.28	0.00	1.25	24.08	0.36	0.14	0.00	1.64	0.41	12.45	3.85	0.00	36.26
10035.00	8.95	0.31	5.62	0.29	0.00	7.41	0.00	0.00	2.29	20.74	0.00	0.00	0.00	1.64	0.18	8.79	3.83	0.00	39.96
10037.00	2.05	0.00	4.45	2.34	2.18	9.74	0.00	0.00	0.03	22.92	0.26	0.13	0.15	0.84	0.30	4.54	4.34	0.01	45.72
10036.00	0.70	0.04	4.41	0.89	0.33	10.55	0.00	0.00	1.50	22.83	2.18	0.07	0.00	1.67	0.26	0.00	3.40	0.01	51.15
10037.00	1.51	0.10	4.36	2.76	4.47	9.64	0.00	0.00	0.31	17.78	1.05	0.00	0.03	1.05	0.23	2.32	8.29	0.00	46.09
10036.00	0.89	0.11	3.98	6.48	0.73	15.77	0.00	0.00	0.02	16.85	0.48	0.12	0.00	0.81	0.47	1.36	5.17	0.02	46.74
10037.00	0.55	0.09	5.06	0.21	0.40	8.68	0.00	0.00	0.01	23.77	0.21	0.04	0.00	5.09	0.47	0.00	3.40	0.01	52.03
10036.00	0.36	0.07	5.49	0.23	0.08	9.96	0.14	0.00	0.00	21.60	0.62	0.00	0.00	5.48	0.29	4.81	4.50	0.02	46.36
10036.00	1.81	0.13	5.49	2.53	0.29	12.89	0.00	0.00	0.00	20.35	0.80	0.03	0.00	0.64	0.00	6.88	5.38	0.00	42.77

10037.00	5.05	0.04	4.58	0.42	0.36	9.55	0.00	0.00	0.01	24.28	0.44	0.00	0.00	1.13	0.34	5.41	4.53	0.01	43.85
10037.00	2.35	0.00	3.34	0.50	2.66	8.40	0.00	0.54	3.73	23.90	0.35	0.27	0.04	2.69	0.13	9.73	3.75	0.00	37.64
10034.00	4.90	0.01	4.11	2.02	0.19	7.74	0.00	0.02	4.75	22.77	0.21	0.05	0.00	1.44	0.17	9.13	3.82	0.00	38.66
10036.00	0.87	0.00	4.19	2.06	1.99	8.24	0.00	0.00	0.02	23.99	0.34	0.00	0.18	0.67	0.26	9.68	7.60	0.00	39.91
10037.00	6.13	0.12	2.31	3.62	0.32	9.52	0.08	0.00	0.05	19.36	0.22	0.16	0.03	1.33	0.43	9.39	6.22	0.00	40.70
10037.00	1.69	1.71	2.94	0.13	2.39	9.61	0.00	0.00	0.11	22.76	0.80	0.13	0.04	2.18	0.17	8.50	3.41	4.47	38.96
10037.00	0.69	0.08	5.16	1.72	2.56	8.37	0.00	0.00	0.00	22.86	0.49	0.01	0.03	1.36	0.42	3.85	8.99	0.01	43.39
10037.00	4.57	0.21	3.31	0.64	2.68	10.97	0.77	0.00	0.06	17.85	0.18	0.18	0.01	2.87	0.41	8.18	3.44	2.06	41.60
10036.00	1.69	0.14	3.40	2.02	0.74	10.30	0.00	0.00	0.03	23.94	0.53	0.00	0.00	1.25	0.23	9.61	6.98	0.00	39.12
10037.00	2.39	0.13	7.15	0.19	0.01	10.75	0.23	0.00	0.01	20.70	0.13	0.18	0.00	1.04	0.23	0.14	7.97	0.04	48.71
10035.00	0.69	0.03	4.19	1.67	0.51	12.22	0.00	0.00	0.25	20.85	0.47	0.08	0.00	3.47	1.03	0.00	3.85	0.04	50.66
10037.00	2.56	0.01	4.71	0.48	0.30	9.10	0.00	0.00	1.82	22.50	0.18	0.00	0.00	1.50	0.28	7.94	7.61	0.00	41.02
10035.00	1.06	0.06	5.51	0.42	3.61	12.11	2.59	0.00	0.09	17.88	0.26	0.00	0.10	2.23	0.14	6.41	6.88	0.03	40.62
10037.00	0.82	0.21	2.90	2.19	0.59	6.71	0.00	0.00	1.35	22.43	3.52	0.02	0.29	1.13	0.05	6.44	7.25	0.00	44.11
10036.00	1.06	0.28	4.73	0.44	0.41	9.22	0.00	0.00	0.03	24.78	0.26	0.15	0.06	1.57	0.38	6.60	8.64	0.00	41.38
10037.00	0.23	0.03	4.23	0.13	2.33	8.87	0.00	0.00	0.00	27.47	0.63	0.00	0.00	2.22	0.42	4.98	3.06	0.01	45.38
10036.00	4.77	0.01	6.54	0.12	0.03	7.17	0.00	0.00	1.51	21.84	0.59	0.27	0.00	1.50	0.13	6.68	8.09	0.03	40.72
10037.00	2.01	0.00	5.13	0.00	0.00	9.24	0.12	0.58	0.02	25.47	0.34	0.05	0.00	1.32	0.53	4.67	4.71	0.02	45.77
10037.00	1.02	0.11	5.45	2.58	0.20	10.74	0.00	0.00	0.00	22.41	0.55	0.01	0.00	5.01	1.21	6.92	2.45	0.02	41.33
10037.00	0.43	0.01	4.31	0.00	3.29	11.32	0.00	0.68	0.00	21.26	0.44	0.01	0.10	0.97	0.60	0.01	4.88	0.03	51.65
10037.00	1.06	0.02	2.85	0.00	3.17	8.08	0.47	0.00	2.66	19.41	0.40	0.00	0.00	2.08	0.24	8.02	9.22	0.92	41.42
10037.00	1.90	0.07	4.86	0.39	0.09	7.36	0.00	0.21	1.59	20.68	4.48	0.04	0.05	1.80	0.41	3.33	8.43	0.02	44.30
10037.00	3.14	0.00	3.78	2.00	3.11	8.87	0.00	0.00	2.23	23.09	0.85	0.00	0.00	1.19	0.20	8.56	3.96	0.00	39.02
10037.00	1.45	0.17	4.80	0.05	0.27	8.55	0.06	0.00	0.00	24.28	2.57	0.00	0.00	3.24	0.54	0.00	3.36	0.01	50.65
10034.00	0.53	0.00	7.65	0.02	0.02	13.56	0.00	0.00	1.07	20.07	0.30	0.34	0.07	3.52	0.85	5.82	2.72	0.11	43.35
10037.00	1.04	0.06	5.19	0.00	0.10	8.69	0.00	0.00	2.24	25.29	3.08	0.09	0.00	1.49	0.49	7.73	3.65	0.00	40.86
10035.00	2.04	0.06	4.63	0.33	1.90	7.10	0.10	0.00	0.00	24.01	0.72	0.12	0.06	5.10	0.18	11.18	4.91	0.00	37.56
10037.00	3.92	0.08	5.56	0.09	1.02	9.03	0.00	0.00	0.06	19.49	4.20	0.01	0.01	2.35	0.24	3.82	3.82	0.07	46.24
10036.00	5.33	0.08	3.40	0.22	3.11	5.99	0.00	0.00	0.21	24.32	3.82	0.21	0.01	1.67	0.18	7.79	3.75	0.90	39.02

10037.00	4.44	0.08	1.79	4.97	0.33	6.95	0.00	0.00	0.13	21.31	0.53	0.51	0.23	0.96	0.09	6.74	8.81	0.00	42.14
10036.00	2.12	0.01	5.59	0.38	0.02	10.77	0.00	0.00	2.93	20.06	0.22	0.00	0.01	1.88	0.40	8.40	7.99	0.01	39.22
10036.00	2.23	0.04	4.20	1.06	3.75	7.55	0.00	0.00	0.05	22.60	0.38	0.00	0.00	1.15	0.31	7.56	8.38	0.01	40.75
10035.00	5.19	0.11	7.13	0.23	3.57	8.77	0.00	0.00	0.04	20.14	0.30	0.05	0.00	1.15	0.57	4.00	3.68	0.03	45.03
10035.00	4.70	0.14	4.10	0.63	2.93	5.63	0.00	0.00	0.02	23.51	0.34	0.14	0.00	1.42	0.23	7.35	8.83	0.01	40.00
10036.00	1.62	0.05	6.43	0.12	1.42	8.56	0.07	0.00	0.00	21.82	0.45	0.29	0.00	5.54	0.56	2.71	3.91	0.01	46.43
10037.00	0.19	0.09	5.19	0.05	0.28	10.87	0.00	0.54	0.13	19.55	0.62	0.07	0.00	7.09	0.46	0.02	3.78	0.03	51.06
10036.00	1.20	0.00	5.22	0.10	1.80	9.59	0.00	0.00	0.00	18.64	0.86	0.00	0.04	5.57	0.65	0.00	3.98	0.11	52.22
10036.21	2.24	0.10	4.58	0.94	1.16	9.25	0.07	0.07	0.92	22.28	0.82	0.13	0.03	2.12	0.32	6.24	5.43	0.20	43.12

Appendix 2C: Maxent Permutation Importance Scores for Present Day

Bio1	Bio2	Bio3	Bio4	Bio5	Bio6	Bio7	Bio8	Bio9	Bio10	Bio11	Bio12	Bio13	Bio14	Bio15	Bio16	Bio17	Bio18	Bio19
2.26	81.11	2.83	0.00	0.17	0.00	0.15	0.17	0.00	0.00	0.42	8.95	0.03	0.54	1.51	0.00	0.00	0.03	1.82
0.00	10.99	1.19	0.00	0.00	0.00	0.00	3.08	0.07	0.00	0.00	6.23	0.29	11.43	66.13	0.01	0.00	0.56	0.00
0.00	5.24	4.18	0.00	0.00	0.00	0.00	1.18	0.60	0.02	0.08	5.11	0.42	0.69	81.61	0.52	0.00	0.05	0.29
0.00	22.76	17.45	0.08	6.37	0.00	0.00	0.15	3.42	0.06	0.00	19.71	3.22	0.00	20.61	0.08	1.78	0.35	3.95
0.03	41.76	7.32	0.00	2.01	0.07	0.00	0.22	0.00	0.00	2.63	10.63	3.88	19.36	3.81	0.00	0.00	4.98	3.31
0.00	7.31	0.67	0.00	0.00	0.00	0.00	5.25	0.01	0.00	0.03	1.49	0.04	3.72	81.30	0.09	0.00	0.05	0.02
0.03	3.74	10.17	0.00	0.78	0.61	0.00	0.00	2.24	0.00	0.00	12.22	0.00	2.61	22.69	0.26	0.59	2.37	41.70
0.00	8.10	3.27	0.00	0.00	0.00	0.04	0.24	1.10	0.01	0.00	5.09	0.00	3.85	75.17	0.71	0.18	0.13	2.12
0.00	14.10	0.75	0.00	0.00	0.00	0.00	2.24	0.21	0.00	0.02	7.31	0.00	8.67	66.50	0.01	0.00	0.18	0.00
0.00	19.82	0.59	0.00	0.00	0.00	0.00	0.70	0.00	0.01	0.35	1.98	0.03	0.92	75.48	0.13	0.00	0.00	0.00
0.00	12.50	1.35	0.00	0.00	0.00	0.00	0.71	0.04	0.01	0.12	5.26	0.11	0.52	79.37	0.00	0.00	0.00	0.01
0.00	16.54	6.23	0.08	0.00	0.28	0.00	0.14	1.68	0.00	0.00	7.28	0.00	7.57	57.73	0.08	0.03	0.77	1.59
0.00	10.23	0.72	0.00	0.00	0.02	0.00	4.16	0.01	0.00	0.15	9.51	0.00	2.69	72.43	0.00	0.00	0.07	0.00
0.07	66.40	8.33	0.00	0.11	0.18	0.00	1.33	0.00	0.02	0.48	3.89	4.35	5.09	5.54	0.74	0.05	1.32	2.09
0.02	16.03	14.61	0.04	0.30	0.00	0.05	1.76	1.09	0.00	0.00	18.79	5.89	0.00	40.42	0.00	0.00	0.00	1.02
0.00	45.33	7.76	0.00	2.73	0.00	0.00	1.21	0.01	0.00	1.57	20.22	5.65	0.76	14.50	0.00	0.05	0.03	0.19
0.08	8.49	10.76	0.00	3.73	0.00	0.17	0.00	0.01	0.00	0.26	7.79	0.25	0.87	0.96	0.32	0.02	0.00	66.29
0.00	42.77	16.18	0.00	0.00	0.00	0.00	0.72	0.62	0.01	0.00	14.28	16.04	2.30	5.51	0.00	0.42	0.48	0.66
0.00	9.83	3.14	0.00	0.05	0.00	0.00	1.87	1.31	0.00	0.00	2.79	0.10	2.15	76.33	0.05	1.05	0.44	0.90

0.00	92.49	1.01	0.00	0.28	0.00	0.00	0.26	0.00	0.00	0.61	1.78	0.00	0.71	0.26	0.03	0.00	0.00	2.56
0.00	8.24	2.52	0.00	0.13	0.00	0.00	0.90	0.00	0.00	0.08	8.18	0.32	0.39	79.13	0.11	0.00	0.00	0.00
0.00	12.91	4.10	0.00	0.00	0.95	0.00	0.25	2.02	0.00	0.00	5.29	0.00	6.33	59.54	0.15	0.23	1.46	6.79
0.00	23.90	2.58	0.00	0.05	0.00	0.00	0.79	0.00	0.00	0.22	5.72	0.00	0.03	66.55	0.15	0.00	0.00	0.01
0.00	6.43	2.41	0.00	0.51	0.00	0.00	0.99	0.05	0.00	0.39	4.38	0.15	0.80	83.59	0.16	0.00	0.13	0.00
0.00	8.58	1.27	0.00	0.00	0.00	0.00	1.60	0.00	0.00	0.17	3.45	0.60	10.59	72.79	0.31	0.00	0.63	0.00
0.00	11.92	2.66	0.00	0.37	0.00	0.00	0.40	0.23	0.00	1.13	6.76	0.00	8.20	66.68	0.08	0.04	1.07	0.43
0.00	5.14	1.93	0.00	0.31	0.00	0.00	2.28	0.01	0.00	0.01	3.11	0.10	4.99	81.61	0.22	0.03	0.26	0.00
0.02	27.74	0.57	0.00	0.00	0.00	0.01	0.41	0.42	0.00	0.07	5.61	0.00	12.54	52.15	0.06	0.00	0.11	0.30
0.01	11.28	0.45	0.00	0.02	0.15	0.00	0.88	0.00	0.00	0.00	7.05	0.02	5.26	74.61	0.01	0.01	0.13	0.12
0.02	18.01	2.72	0.00	0.00	8.24	0.02	0.06	1.77	0.00	0.00	11.56	2.84	3.85	45.54	0.05	0.00	3.70	1.62
0.04	24.43	7.33	0.00	0.00	0.00	0.00	0.33	0.84	0.00	0.00	14.30	0.26	1.89	46.26	0.00	0.00	0.90	3.43
0.00	22.64	2.03	0.00	0.10	0.03	0.00	2.36	0.00	0.01	0.62	4.96	0.90	26.99	33.42	0.05	0.09	5.80	0.00
0.07	61.25	1.73	0.00	0.37	0.00	0.00	0.40	0.00	0.03	1.18	10.40	0.00	0.58	21.62	0.52	0.00	0.00	1.85
0.00	16.34	1.53	0.00	0.03	0.03	0.00	0.00	1.03	0.00	0.00	3.47	0.27	2.87	73.09	0.14	0.00	0.50	0.71
0.00	11.08	4.69	0.03	0.00	11.19	0.00	0.00	1.83	0.00	0.00	4.37	59.88	0.17	3.57	0.22	0.00	2.37	0.59
0.01	8.89	3.16	0.00	0.00	0.00	0.00	0.53	0.68	0.01	0.00	3.27	0.36	5.17	76.26	0.17	0.19	0.82	0.48
0.00	10.79	1.26	0.00	0.00	0.00	0.00	1.89	0.00	0.00	0.37	4.25	0.12	5.50	75.22	0.00	0.00	0.59	0.00
0.00	24.83	3.05	0.00	0.14	0.00	0.00	1.45	0.00	0.00	0.71	5.64	1.64	1.22	61.09	0.20	0.00	0.00	0.01
0.00	75.93	1.99	0.00	0.04	0.00	0.00	0.30	0.00	0.00	0.00	4.75	0.27	2.23	0.14	0.12	0.00	0.03	14.22
0.00	18.20	0.51	0.00	0.00	2.80	0.02	0.04	1.63	0.00	0.00	6.75	0.05	4.76	62.40	0.00	0.00	1.64	1.21
0.00	3.43	17.59	0.00	30.67	0.00	0.00	1.21	0.00	0.13	3.02	8.19	3.90	8.77	15.81	0.34	0.00	6.35	0.59
0.00	9.27	4.61	0.00	0.55	0.00	0.02	1.58	0.39	0.00	0.00	3.21	1.01	0.69	78.00	0.25	0.00	0.36	0.05
0.00	7.35	16.84	0.00	24.00	0.00	0.00	0.00	0.00	0.02	1.00	15.48	0.41	0.53	2.59	0.35	0.00	0.00	31.42
0.01	21.67	3.41	0.00	0.50	0.00	0.00	1.24	0.00	0.02	0.41	8.26	0.12	0.27	63.08	0.00	0.00	0.00	1.01
0.00	12.62	0.74	0.00	0.00	0.00	0.00	3.93	0.06	0.00	0.51	1.53	0.19	10.10	68.44	0.60	0.00	1.29	0.00
0.00	5.78	1.20	0.00	0.06	0.00	0.00	0.96	0.24	0.00	0.11	6.10	0.00	7.42	77.96	0.01	0.00	0.16	0.00
0.00	8.37	1.38	0.00	0.00	0.00	0.01	3.26	0.06	0.00	0.00	4.42	0.01	8.09	74.11	0.04	0.00	0.27	0.00
0.00	9.12	4.96	0.00	0.67	0.00	0.00	1.34	0.08	0.00	0.82	2.52	0.80	6.91	69.76	0.78	0.00	1.09	1.14

0.00	16.81	1.24	0.00	0.45	0.08	0.00	0.50	0.27	0.00	0.03	8.81	0.00	2.14	68.05	0.00	0.00	0.37	1.24
0.02	15.83	4.83	0.10	0.00	0.00	0.00	0.28	2.25	0.00	0.00	10.18	0.22	4.25	56.60	0.00	0.28	0.64	4.51
0.00	65.26	1.40	0.00	0.38	0.00	0.00	0.82	0.00	0.08	1.35	6.21	0.00	0.55	23.10	0.37	0.00	0.00	0.48
0.00	91.81	0.91	0.00	0.18	0.00	0.00	0.49	0.00	0.00	0.56	2.84	0.00	0.82	0.27	0.05	0.00	0.01	2.06
0.00	6.28	1.94	0.00	0.15	0.00	0.00	0.62	0.00	0.01	0.10	1.50	0.04	1.59	87.40	0.37	0.00	0.00	0.00
0.00	16.22	2.36	0.00	0.10	0.00	0.00	1.00	0.00	0.06	0.70	12.87	1.34	6.42	56.81	0.21	0.00	1.90	0.00
0.00	10.34	2.84	0.00	0.00	0.09	0.00	0.24	0.60	0.00	0.01	5.88	0.09	13.72	63.35	0.04	0.32	2.11	0.38
0.01	60.46	2.95	0.15	0.00	0.00	0.00	0.47	0.89	0.00	0.01	0.98	0.00	0.00	32.48	0.47	0.00	0.00	1.14
0.00	4.60	6.94	0.00	0.27	0.00	0.00	0.02	0.74	0.00	0.01	4.61	0.00	7.66	73.45	0.00	0.15	1.36	0.19
0.00	20.26	1.26	0.00	0.00	0.00	0.00	2.24	0.00	0.00	0.78	0.84	0.23	7.08	65.03	0.32	0.00	1.96	0.00
0.00	80.70	0.58	0.00	0.04	0.00	0.00	1.06	0.08	0.00	0.46	3.51	0.13	2.53	10.39	0.07	0.00	0.12	0.33
0.00	11.53	1.75	0.00	0.36	0.16	0.00	0.62	0.32	0.01	0.93	11.98	0.06	3.11	68.18	0.00	0.20	0.07	0.72
0.00	6.94	4.80	0.00	0.00	0.17	0.00	0.43	0.18	0.00	0.00	11.67	1.21	3.18	68.94	0.00	0.03	2.13	0.33
0.01	28.93	1.58	0.00	0.00	0.00	0.00	1.30	0.00	0.00	0.17	3.06	0.00	0.25	62.95	1.33	0.00	0.00	0.42
0.00	39.05	8.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.23	0.67	0.00	24.38	0.44	0.14	1.61	6.07
0.00	8.06	1.39	0.01	0.00	0.00	0.00	4.79	0.00	0.00	0.00	11.02	0.27	6.34	67.43	0.00	0.00	0.43	0.27
0.01	8.30	3.41	0.00	0.38	0.00	0.00	4.11	0.00	0.01	0.20	6.35	0.55	4.87	70.67	0.05	0.00	1.09	0.00
0.00	36.92	3.72	0.00	0.00	0.00	0.00	0.23	0.11	0.00	0.00	1.15	0.39	0.00	55.90	0.65	0.00	0.00	0.93
0.00	15.98	7.77	0.20	0.00	0.00	0.00	0.23	1.35	0.00	0.00	12.04	0.03	4.93	54.77	0.00	0.05	0.37	2.28
0.00	3.53	26.65	0.00	5.52	0.00	0.00	0.00	1.08	0.00	0.00	16.63	38.77	0.49	4.28	0.00	0.08	1.62	1.36
0.00	27.77	3.72	0.00	0.00	0.00	0.00	2.55	0.00	0.00	0.29	6.03	0.00	1.37	57.59	0.00	0.00	0.40	0.29
0.00	7.28	5.55	0.00	1.31	3.68	0.00	0.23	0.40	0.04	0.00	9.86	0.00	0.19	41.91	0.00	0.14	3.01	26.41
0.00	5.20	3.45	0.00	0.00	0.00	0.00	0.34	1.85	0.01	0.00	3.26	0.00	5.20	79.46	0.19	0.00	0.18	0.86
0.00	10.60	1.79	0.00	0.09	0.00	0.00	1.73	0.00	0.00	0.00	9.37	0.30	1.64	74.44	0.04	0.00	0.00	0.00
0.00	11.10	3.42	0.00	0.00	0.00	0.00	3.19	0.00	0.00	1.00	5.46	1.05	7.23	65.35	0.08	0.00	2.12	0.00
0.01	13.80	1.46	0.00	0.00	0.00	0.00	2.84	0.00	0.00	0.00	4.24	0.12	1.94	75.44	0.15	0.00	0.00	0.00
0.01	18.12	0.78	0.00	0.00	0.33	0.00	1.88	0.00	0.00	0.12	5.00	0.02	3.69	69.43	0.02	0.00	0.29	0.28
0.00	12.66	9.24	0.00	0.00	0.70	0.02	0.03	0.53	0.07	0.00	6.94	1.48	12.94	42.76	0.44	0.05	9.77	2.38
0.00	13.42	2.34	0.00	0.06	0.14	0.00	1.44	0.23	0.00	0.00	5.61	0.63	24.51	48.94	0.00	0.14	2.54	0.00

0.00	10.78	2.65	0.00	0.05	0.22	0.00	2.04	0.34	0.00	0.10	6.62	0.89	5.17	68.95	0.00	0.15	2.05	0.00
0.00	9.53	32.67	0.05	4.66	0.00	0.00	0.00	0.06	0.04	0.12	10.60	10.83	7.25	6.97	0.17	1.01	10.04	6.01
0.00	27.70	6.31	0.00	0.62	0.00	0.00	5.22	0.00	0.00	1.50	5.00	5.74	6.39	38.14	0.15	0.00	3.19	0.04
0.50	33.50	1.38	0.00	0.00	0.00	0.01	0.75	0.00	0.00	0.49	4.16	0.00	0.51	58.30	0.21	0.01	0.00	0.17
0.00	3.55	6.01	0.00	0.00	0.00	0.00	2.16	0.34	0.02	0.22	2.52	2.51	4.41	76.06	0.22	0.02	1.84	0.11
0.00	43.59	19.00	0.00	0.00	0.48	0.00	0.04	0.00	0.00	0.00	5.17	17.02	2.17	3.41	0.52	0.05	3.24	5.30
0.00	13.84	3.87	0.00	0.33	0.00	0.00	0.11	1.44	0.00	0.35	17.97	0.00	2.16	55.88	0.00	0.00	1.02	3.03
0.00	19.49	3.49	0.27	0.22	0.50	0.00	0.33	5.86	0.04	0.00	11.13	0.00	6.33	45.27	0.00	0.02	0.32	6.72
0.01	11.12	6.58	0.00	1.54	1.60	0.03	0.61	0.69	0.00	0.04	13.06	0.00	0.16	53.42	0.00	0.46	0.99	9.68
0.00	29.43	3.06	0.00	0.27	0.00	0.05	1.01	0.30	0.00	0.54	2.31	0.04	3.67	57.93	0.31	0.00	0.49	0.57
0.00	11.00	35.47	0.83	3.37	1.33	0.03	0.00	2.78	0.01	0.00	11.43	3.98	6.65	10.79	0.00	0.01	10.27	2.05
0.00	3.30	1.97	0.00	0.14	0.00	0.00	2.13	0.00	0.01	0.03	3.84	0.01	1.64	86.76	0.16	0.00	0.00	0.00
0.00	24.60	1.14	0.00	0.03	0.00	0.01	0.53	0.00	0.00	0.04	3.95	0.00	3.36	66.17	0.09	0.00	0.00	0.07
0.00	7.29	1.85	0.00	0.00	0.00	0.00	0.97	0.00	0.01	0.02	2.74	0.00	3.54	83.50	0.01	0.00	0.05	0.03
0.00	11.32	2.25	0.00	0.00	0.00	0.00	0.44	0.39	0.01	0.00	5.38	0.00	0.00	79.43	0.11	0.00	0.00	0.67
0.00	9.59	1.14	0.00	0.00	0.00	0.00	4.58	0.17	0.00	0.07	3.31	0.05	9.48	71.00	0.15	0.00	0.47	0.00
2.47	90.41	0.50	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.35	3.18	0.00	0.46	1.69	0.07	0.00	0.05	0.62
0.01	5.04	33.56	1.97	0.22	9.40	0.00	0.00	3.32	0.00	0.00	14.37	3.60	1.34	12.00	0.04	0.78	3.65	10.71
0.00	16.17	18.02	0.00	0.43	1.13	0.00	0.00	4.75	0.00	0.00	12.17	1.98	6.32	19.18	0.01	0.12	3.57	16.17
0.00	13.76	25.73	0.00	4.61	0.00	0.00	0.00	2.52	0.07	0.00	10.33	2.03	0.36	34.63	0.00	0.00	0.00	5.96
0.00	15.04	1.37	0.00	0.11	8.25	0.00	0.00	2.05	0.05	0.00	12.81	0.02	2.02	49.64	0.00	0.00	1.96	6.68
0.00	10.30	0.87	0.00	0.00	0.00	0.00	2.86	0.11	0.00	0.00	1.65	0.05	7.68	76.11	0.20	0.00	0.16	0.00
0.00	52.23	4.73	1.18	0.00	0.00	0.05	1.79	0.85	0.00	0.00	18.36	3.67	0.00	12.45	0.00	0.00	0.00	4.70
0.06	21.62	5.50	0.05	1.01	0.53	0.01	1.14	0.61	0.01	0.28	7.33	2.15	4.31	50.70	0.16	0.09	1.19	3.27
33.23	0.00	1.11	0.00	0.03	0.00	0.00	0.00	0.00	15.50	20.90	0.00	0.00	16.38	3.83	9.04	0.00	0.00	0.00
67.94	0.00	2.21	0.01	0.00	0.00	0.00	0.00	0.00	1.86	1.20	0.00	0.02	16.76	1.52	8.24	0.22	0.02	0.00
0.52	0.00	1.98	0.53	0.00	1.05	0.00	0.00	0.78	36.13	36.16	0.00	0.03	12.45	5.04	4.15	0.11	0.39	0.69
64.39	0.03	0.24	3.40	0.01	0.00	0.00	0.00	0.55	0.23	5.31	0.15	0.00	13.25	0.98	10.80	0.08	0.10	0.48
41.64	0.00	1.71	0.00	0.01	0.00	0.00	0.00	0.00	3.44	22.11	0.00	0.00	16.02	3.61	11.41	0.00	0.05	0.00

41.65	0.07	1.09	0.37	0.00	0.00	0.00	0.00	0.00	5.95	29.46	0.00	0.01	15.90	1.15	4.10	0.22	0.00	0.02
0.00	0.05	0.29	0.70	0.03	0.02	0.00	0.00	0.00	32.78	29.04	0.00	0.00	2.51	5.11	0.00	0.00	0.45	29.01
41.22	0.00	0.48	0.07	0.00	0.00	0.00	0.00	0.00	29.25	6.57	2.75	0.00	15.57	1.87	1.22	0.00	0.02	0.97
11.54	1.18	0.00	17.95	0.00	0.00	0.00	0.00	0.00	38.89	7.99	3.89	0.00	7.80	1.43	5.73	0.00	0.08	3.51
24.20	0.67	0.00	6.21	0.00	0.00	0.00	0.00	0.31	22.23	1.38	0.00	0.10	11.05	3.46	30.31	0.00	0.08	0.01
59.80	0.00	0.36	0.14	0.01	0.00	0.00	0.00	0.00	6.85	1.99	0.00	0.00	17.84	3.94	9.01	0.03	0.01	0.00
67.45	0.00	2.11	0.17	0.00	0.05	0.00	0.00	0.00	4.00	0.75	0.03	0.00	22.00	0.00	0.61	2.45	0.00	0.36
11.38	0.00	2.51	0.23	0.00	0.44	0.02	0.00	0.00	46.12	14.51	0.00	0.00	12.20	3.10	9.41	0.00	0.06	0.02
0.53	0.10	0.75	0.11	0.00	0.01	0.00	0.00	0.03	60.10	13.47	0.00	0.00	7.98	1.92	14.58	0.11	0.09	0.23
2.89	0.00	0.19	0.11	0.00	0.00	0.00	0.00	0.00	54.39	16.17	0.26	0.00	16.99	2.08	6.73	0.00	0.00	0.18
41.69	0.00	2.08	0.00	0.01	0.00	0.00	0.00	0.05	10.75	11.67	14.40	0.00	18.95	0.00	0.02	0.08	0.00	0.31
25.07	0.28	0.25	1.74	0.02	0.00	0.00	0.00	0.00	30.34	14.82	7.15	0.00	15.02	3.62	0.40	0.00	0.26	1.04
6.93	0.22	0.11	1.76	0.00	0.00	0.00	0.00	0.09	40.79	30.51	0.08	0.00	8.02	2.77	8.57	0.00	0.01	0.13
20.70	0.05	0.02	0.70	0.00	0.00	0.00	0.00	0.02	30.55	23.83	0.00	0.00	19.37	0.69	3.15	0.85	0.00	0.08
67.94	0.00	0.66	0.18	0.02	0.00	0.00	0.00	0.56	0.91	0.69	0.00	0.00	19.63	2.01	7.16	0.13	0.11	0.00
18.00	0.04	0.47	0.00	0.03	0.00	0.00	0.00	0.00	44.78	10.26	0.00	0.00	22.16	0.00	0.12	3.93	0.08	0.12
4.67	0.00	1.56	0.02	0.00	0.08	0.00	0.00	0.00	40.82	21.68	0.00	0.00	10.87	2.99	17.24	0.01	0.00	0.05
0.06	0.00	2.38	3.09	0.00	1.67	0.00	0.00	0.11	8.57	35.74	0.02	0.00	8.72	12.23	25.30	0.00	1.29	0.82
28.64	0.08	0.00	0.22	0.00	0.05	0.00	0.00	0.00	40.22	8.66	0.00	0.00	19.30	0.99	1.52	0.20	0.00	0.12
74.68	0.00	2.59	0.05	0.00	0.00	0.00	0.00	0.08	0.09	0.50	0.93	0.04	14.09	0.67	6.16	0.00	0.00	0.11
6.84	0.01	1.36	0.00	0.01	0.00	0.00	0.00	0.00	43.10	19.50	0.00	0.03	18.31	1.55	8.65	0.60	0.04	0.00
40.05	0.04	2.36	0.03	0.00	0.00	0.00	0.00	0.00	21.59	3.13	0.00	0.00	13.23	3.46	15.75	0.00	0.34	0.00
32.30	0.20	0.04	3.43	0.00	0.00	0.00	0.00	0.15	28.30	13.04	9.85	0.06	12.18	0.30	0.00	0.00	0.00	0.16
37.86	0.86	0.00	15.86	0.00	0.00	0.00	0.00	0.00	15.14	5.45	0.00	0.00	10.90	0.92	12.87	0.00	0.00	0.15
70.04	0.00	0.94	0.05	0.01	0.00	0.00	0.00	0.00	0.46	1.71	0.00	0.00	25.74	0.16	0.01	0.83	0.00	0.05
54.48	0.00	2.14	0.01	0.00	0.00	0.00	0.00	0.17	1.51	3.10	0.00	0.00	14.72	3.30	20.53	0.00	0.00	0.03
72.70	0.01	2.18	0.22	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.05	0.07	18.36	1.41	4.97	0.00	0.02	0.00
47.72	0.00	4.82	0.00	0.01	0.03	0.00	0.00	0.00	2.33	5.89	19.15	0.00	14.49	0.84	0.00	0.00	0.28	4.44
61.96	0.00	1.02	0.07	0.00	0.00	0.00	0.00	0.00	7.94	1.22	0.00	0.00	18.18	1.13	8.36	0.11	0.00	0.02

60.52	0.01	1.61	0.06	0.00	0.00	0.00	0.00	0.06	2.45	5.28	3.79	0.00	22.68	2.30	0.05	0.00	0.00	1.16
81.17	0.00	1.03	0.03	0.00	0.23	0.00	0.00	0.00	0.01	0.00	0.00	0.01	14.96	0.13	2.34	0.09	0.00	0.00
44.60	0.07	3.42	0.83	0.00	0.00	0.00	0.00	0.00	9.50	17.74	5.41	0.00	11.92	1.84	0.00	0.00	0.11	4.57
31.66	0.56	0.00	15.45	0.00	0.00	0.00	0.00	0.00	20.68	8.54	0.00	0.01	10.88	1.51	10.42	0.00	0.06	0.23
52.20	0.10	1.23	0.06	0.00	0.00	0.00	0.00	0.00	16.41	0.10	0.00	0.04	21.86	2.31	5.63	0.03	0.03	0.00
76.73	0.00	4.40	0.04	0.00	0.00	0.00	0.00	0.00	1.36	0.04	0.23	0.02	16.36	0.21	0.36	0.19	0.00	0.07
15.84	0.00	1.78	0.03	0.00	0.00	0.00	0.00	0.00	21.59	44.58	0.00	0.06	12.27	1.77	2.09	0.00	0.00	0.00
0.04	0.04	0.03	0.00	0.05	0.00	0.00	0.00	0.00	74.15	4.66	0.00	0.00	13.86	1.39	5.74	0.00	0.00	0.04
37.31	0.04	1.87	0.09	0.00	0.00	0.00	0.00	0.16	7.74	14.96	0.00	0.00	19.38	2.07	16.33	0.00	0.00	0.06
19.89	0.09	0.52	1.72	0.00	0.00	0.00	0.00	0.00	21.80	21.77	0.00	0.05	10.38	5.09	18.62	0.00	0.05	0.00
0.09	0.26	0.00	2.99	0.00	0.00	0.00	0.00	0.06	52.91	19.49	0.00	0.00	4.85	2.95	16.22	0.00	0.09	0.09
62.79	0.00	0.53	0.00	0.00	0.07	0.00	0.00	0.04	10.81	0.02	4.82	0.00	19.08	0.25	0.28	0.03	0.01	1.27
0.91	0.00	1.09	0.04	0.00	0.00	0.00	0.00	0.00	49.81	33.40	0.00	0.02	7.03	0.21	7.44	0.00	0.00	0.05
60.19	0.14	1.35	0.34	0.00	0.00	0.00	0.00	0.00	4.32	1.50	0.00	0.03	16.75	2.53	12.84	0.00	0.00	0.00
61.09	0.26	0.25	4.75	0.00	0.00	0.00	0.00	0.00	9.99	0.86	0.00	0.05	16.88	0.33	4.76	0.72	0.02	0.04
61.24	0.09	0.00	1.03	0.00	0.95	0.00	0.00	0.06	16.65	0.56	1.41	0.00	13.28	0.38	3.51	0.00	0.00	0.82
0.00	0.03	0.11	2.28	0.00	0.16	0.00	0.00	0.02	10.95	61.15	0.00	0.78	3.59	6.23	0.00	0.00	0.18	14.52
0.04	0.02	0.98	8.11	0.00	3.22	0.00	0.00	0.00	19.19	20.99	0.00	0.00	4.19	10.18	30.76	0.07	2.23	0.00
65.84	0.00	1.76	0.00	0.02	0.00	0.01	0.00	0.00	7.76	0.03	0.45	0.04	23.62	0.08	0.19	0.20	0.00	0.00
28.39	0.36	0.08	17.06	0.00	0.00	0.00	0.00	0.01	1.56	11.35	13.24	1.27	8.81	7.29	0.00	0.00	3.23	7.37
19.58	0.07	0.00	0.75	0.02	0.00	0.00	0.00	0.04	48.13	9.55	1.43	0.00	15.96	2.56	1.64	0.00	0.00	0.28
75.32	0.00	2.73	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	18.81	0.08	2.81	0.21	0.00	0.01
37.65	0.00	8.91	0.07	0.00	0.07	0.00	0.00	0.00	8.22	22.80	0.00	0.18	9.57	4.44	7.81	0.00	0.06	0.21
55.55	0.06	0.74	0.78	0.00	0.00	0.00	0.00	0.00	2.82	1.17	0.31	0.00	17.51	3.68	0.00	0.00	0.18	17.20
0.63	0.22	0.01	1.01	0.02	0.00	0.00	0.00	0.00	68.87	7.46	0.00	0.00	10.62	1.36	9.67	0.00	0.00	0.14
26.72	0.31	0.32	4.18	0.00	0.00	0.00	0.00	0.00	25.10	16.56	0.00	0.00	12.68	3.35	10.59	0.00	0.10	0.09
36.52	0.00	3.29	2.91	0.00	0.01	0.00	0.00	0.00	0.31	20.58	0.34	0.00	6.88	7.18	0.00	0.00	0.67	21.30
0.00	0.04	0.00	4.28	0.00	0.13	0.00	0.00	0.00	41.37	37.34	0.00	0.00	3.18	2.21	11.13	0.03	0.08	0.23
2.80	0.01	0.70	0.00	0.00	0.00	0.00	0.00	0.00	35.80	48.56	0.00	0.00	10.74	0.00	0.76	0.57	0.00	0.07

1.19	0.03	0.00	0.42	0.00	0.00	0.00	0.00	0.00	48.83	26.70	0.00	0.00	12.14	3.38	7.20	0.02	0.05	0.05
69.57	0.00	1.21	0.00	0.00	0.00	0.00	0.00	0.00	3.97	0.71	0.07	0.02	21.47	1.50	1.46	0.01	0.00	0.00
41.99	0.00	1.67	0.00	0.00	0.00	0.00	0.00	0.00	19.09	10.81	0.00	0.00	23.27	0.62	1.67	0.84	0.00	0.03
48.45	0.00	3.81	0.00	0.00	0.00	0.00	0.00	0.00	17.02	4.38	0.00	0.00	11.97	1.88	12.31	0.04	0.01	0.15
54.95	0.37	0.13	5.97	0.00	0.00	0.00	0.00	0.02	11.40	0.30	0.00	0.04	14.25	1.77	10.75	0.00	0.00	0.03
71.78	0.00	0.15	0.62	0.10	0.00	0.00	0.00	0.19	5.08	0.16	0.10	0.00	16.79	1.94	3.06	0.00	0.00	0.02
3.48	0.05	0.49	0.51	0.00	0.00	0.00	0.00	0.00	51.21	25.69	0.00	0.00	11.79	2.44	3.75	0.35	0.14	0.09
50.70	0.16	0.23	0.07	0.03	0.00	0.00	0.00	0.10	14.45	0.05	0.01	0.01	24.55	1.33	8.31	0.00	0.00	0.00
11.54	0.35	0.02	2.81	0.00	0.00	0.00	0.00	0.00	46.91	18.54	0.00	0.00	13.53	0.00	2.28	2.94	0.00	1.06
29.04	0.00	1.62	0.04	0.00	0.00	0.00	0.00	0.00	33.04	9.28	0.00	0.00	18.75	2.23	5.15	0.53	0.26	0.06
33.67	0.28	1.48	4.33	0.00	0.06	0.00	0.00	0.13	7.71	15.56	1.81	0.00	13.69	7.61	0.00	0.00	0.45	13.20
69.58	0.00	1.01	0.19	0.00	0.00	0.00	0.00	0.01	1.72	0.26	0.00	0.01	17.31	1.02	8.86	0.03	0.00	0.00
55.50	0.06	0.71	0.08	0.01	1.04	0.00	0.00	0.26	15.22	0.00	0.00	0.06	22.51	0.53	1.76	1.81	0.40	0.06
50.58	0.40	0.94	4.27	0.00	0.16	0.00	0.00	0.00	16.62	0.35	0.04	0.91	8.93	0.39	16.33	0.04	0.00	0.03
1.80	0.15	0.35	0.03	0.00	0.00	0.00	0.00	0.00	64.92	15.98	0.00	0.02	8.89	1.89	5.98	0.00	0.00	0.01
1.36	0.17	0.00	6.14	0.01	0.74	0.00	0.00	0.02	12.26	54.97	0.00	0.00	5.95	7.00	0.88	0.00	0.28	10.24
42.25	0.04	2.79	0.00	0.00	0.00	0.00	0.00	0.00	29.20	2.28	0.00	0.00	19.25	0.80	2.91	0.21	0.14	0.11
0.05	0.00	1.50	0.00	0.00	0.81	0.00	0.00	0.17	55.20	19.31	0.01	0.00	8.39	5.49	8.81	0.00	0.14	0.12
18.12	0.27	0.23	9.54	0.00	0.27	0.00	0.00	0.00	28.02	14.65	0.01	0.00	11.10	7.48	10.20	0.00	0.02	0.10
9.06	0.00	1.73	0.00	0.00	0.00	0.00	0.00	0.00	14.13	10.37	0.03	0.06	9.33	7.62	0.00	0.00	0.15	47.52
54.65	0.00	0.62	0.09	0.02	0.00	0.00	0.00	1.16	6.32	0.57	0.00	0.00	21.39	2.24	12.90	0.00	0.03	0.00
24.69	0.00	1.99	0.00	0.00	0.00	0.00	0.00	0.00	39.27	10.04	0.00	0.06	13.55	2.69	7.46	0.08	0.17	0.00
57.50	0.00	1.47	0.00	0.00	0.00	0.00	0.00	0.00	3.98	17.20	0.00	0.00	16.68	0.78	2.24	0.15	0.00	0.00
2.07	0.15	0.09	1.71	0.00	0.00	0.00	0.00	0.00	9.06	31.15	0.00	0.00	10.67	6.48	0.00	0.00	0.14	38.49
19.09	0.00	6.66	0.12	0.00	0.00	0.00	0.00	0.09	4.41	14.23	16.02	0.00	6.31	8.14	15.94	0.00	2.92	6.07
23.87	0.09	1.10	0.00	0.00	0.00	0.00	0.00	0.00	22.79	27.66	0.06	0.00	17.89	3.43	2.77	0.00	0.00	0.33
0.02	0.11	0.36	0.00	0.00	0.00	0.00	0.00	0.00	55.90	31.95	0.00	0.17	8.04	0.00	0.48	2.92	0.00	0.06
55.97	0.11	0.64	1.78	0.00	0.00	0.00	0.00	0.00	4.23	3.05	0.00	0.01	15.67	3.30	14.98	0.00	0.24	0.00
57.69	0.13	0.19	1.44	0.02	0.00	0.00	0.00	0.00	13.88	3.04	0.01	0.00	18.53	1.20	3.84	0.00	0.00	0.03

22.45	0.00	0.91	0.66	0.00	0.01	0.01	0.00	0.00	44.61	2.98	1.71	0.14	23.76	0.00	0.00	2.69	0.00	0.06
35.09	0.00	1.74	0.00	0.01	0.00	0.00	0.00	0.00	7.62	29.49	0.00	0.02	19.12	2.24	4.47	0.17	0.03	0.00
23.80	0.04	0.04	1.44	0.01	0.00	0.00	0.00	0.08	34.33	18.24	0.00	0.00	13.86	2.31	5.69	0.13	0.03	0.01
47.88	0.27	0.05	7.83	0.00	0.38	0.00	0.00	0.06	11.19	4.14	2.52	0.00	14.08	3.25	6.19	0.00	0.27	1.89
31.35	0.24	0.10	5.25	0.00	0.00	0.00	0.00	0.00	31.80	3.90	0.37	0.00	22.47	0.20	0.70	2.37	0.00	1.24
28.86	0.01	5.56	0.41	0.00	0.00	0.00	0.00	0.00	26.80	20.45	0.97	0.00	11.59	2.65	0.04	0.38	0.02	2.26
0.10	0.41	0.00	2.34	0.00	0.00	0.00	0.00	0.18	46.56	15.99	0.07	0.00	10.65	4.26	0.00	0.00	0.14	19.30
0.00	0.00	0.01	6.53	0.00	0.52	0.00	0.00	0.00	1.49	41.36	0.00	0.00	2.40	5.66	0.00	0.00	0.89	41.13
33.46	0.11	1.20	1.91	0.01	0.12	0.00	0.00	0.06	21.76	13.55	1.14	0.04	14.26	2.58	6.38	0.28	0.18	2.97

Appendix 3A: Maxent Results from 21,000 Years Ago

Species	#Training samples	Regularized training gain	Unregularized training gain	Iterat-ions	Trainin-g AUC	#Test samples	Test gain	Test AUC	AUC Standard Deviation
austrina_0	76	3.968	4.208	500	0.994	25	4.29	0.994	0.001
austrina_1	76	4.102	4.266	500	0.993	25	4.17	0.991	0.005
austrina_2	76	4.339	4.461	500	0.995	25	4.28	0.994	0.001
austrina_3	76	4.136	4.311	500	0.995	25	4.00	0.977	0.018
austrina_4	76	4.232	4.384	500	0.995	25	3.92	0.980	0.013
austrina_5	76	4.026	4.251	500	0.993	25	4.21	0.994	0.001
austrina_6	76	4.161	4.345	500	0.995	25	4.42	0.995	0.001
austrina_7	76	4.040	4.252	500	0.993	25	4.30	0.995	0.001
austrina_8	76	4.222	4.361	500	0.995	25	4.23	0.994	0.001
austrina_9	76	4.121	4.314	500	0.995	25	4.41	0.995	0.001
austrina_10	76	4.031	4.247	500	0.995	25	4.40	0.995	0.001
austrina_11	76	3.980	4.234	500	0.994	25	4.38	0.995	0.001
austrina_12	76	4.105	4.315	500	0.995	25	4.24	0.994	0.001
austrina_13	76	4.085	4.295	500	0.995	25	4.09	0.992	0.002
austrina_14	76	4.099	4.272	500	0.994	25	4.05	0.987	0.009
austrina_15	76	4.105	4.300	500	0.995	25	4.09	0.994	0.001
austrina_16	76	4.101	4.286	500	0.995	25	4.39	0.995	0.001
austrina_17	76	4.127	4.341	500	0.995	25	4.25	0.994	0.001
austrina_18	76	3.922	4.197	500	0.994	25	4.25	0.994	0.001
austrina_19	76	3.972	4.225	500	0.994	25	4.34	0.995	0.001

austrina_20	76	4.156	4.317	500	0.995	25	4.27	0.995	0.001
austrina_21	76	4.066	4.282	500	0.995	25	4.30	0.995	0.001
austrina_22	76	3.976	4.259	500	0.995	25	4.12	0.993	0.001
austrina_23	76	4.013	4.224	500	0.993	25	4.24	0.994	0.002
austrina_24	76	4.091	4.273	500	0.995	25	3.86	0.981	0.013
austrina_25	76	4.135	4.334	500	0.995	25	4.52	0.996	0.001
austrina_26	76	4.377	4.496	500	0.995	25	4.55	0.995	0.001
austrina_27	76	4.077	4.239	500	0.993	25	3.74	0.983	0.008
austrina_28	76	4.180	4.376	500	0.995	25	4.04	0.986	0.009
austrina_29	76	4.013	4.231	500	0.993	25	4.41	0.995	0.001
austrina_30	76	4.210	4.344	500	0.994	25	4.08	0.994	0.001
austrina_31	76	3.852	4.157	500	0.994	25	4.29	0.995	0.001
austrina_32	76	4.200	4.351	500	0.995	25	4.23	0.994	0.001
austrina_33	76	4.110	4.286	500	0.994	25	4.49	0.996	0.001
austrina_34	76	4.003	4.291	500	0.994	25	4.34	0.995	0.001
austrina_35	76	4.065	4.282	500	0.994	25	4.22	0.994	0.001
austrina_36	76	4.269	4.403	500	0.995	25	4.22	0.994	0.001
austrina_37	76	4.121	4.324	500	0.995	25	4.31	0.994	0.001
austrina_38	76	4.092	4.346	500	0.995	25	4.33	0.995	0.001
austrina_39	76	4.202	4.363	500	0.995	25	3.87	0.990	0.004
austrina_40	76	4.297	4.423	500	0.995	25	4.25	0.994	0.001
austrina_41	76	4.058	4.270	500	0.995	25	4.47	0.996	0.001
austrina_42	76	3.985	4.214	500	0.994	25	3.93	0.988	0.005
austrina_43	76	4.040	4.256	500	0.994	25	4.22	0.993	0.001
austrina_44	76	3.992	4.250	500	0.994	25	3.87	0.990	0.004
austrina_45	76	3.934	4.172	500	0.994	25	4.21	0.994	0.001
austrina_46	76	3.925	4.219	500	0.994	25	4.28	0.994	0.001
austrina_47	76	4.224	4.379	500	0.995	25	3.28	0.954	0.027
austrina_48	76	4.162	4.293	500	0.993	25	4.52	0.996	0.001

austrina_49	76	4.158	4.342	500	0.995	25	4.40	0.995	0.001
austrina_50	76	4.130	4.276	500	0.994	25	4.50	0.996	0.001
austrina_51	76	4.164	4.338	500	0.995	25	4.16	0.994	0.001
austrina_52	76	4.097	4.338	500	0.995	25	4.43	0.995	0.001
austrina_53	76	4.101	4.266	500	0.995	25	4.38	0.996	0.001
austrina_54	76	4.207	4.342	500	0.995	25	3.71	0.980	0.014
austrina_55	76	4.105	4.263	500	0.993	25	3.90	0.988	0.006
austrina_56	76	3.908	4.180	500	0.994	25	4.23	0.995	0.001
austrina_57	76	4.155	4.356	500	0.995	25	4.39	0.995	0.001
austrina_58	76	3.969	4.217	500	0.994	25	4.44	0.996	0.001
austrina_59	76	4.182	4.326	500	0.995	25	3.88	0.981	0.013
austrina_60	76	4.119	4.298	500	0.995	25	4.33	0.995	0.001
austrina_61	76	4.182	4.343	500	0.995	25	3.35	0.962	0.022
austrina_62	76	4.039	4.254	500	0.994	25	4.13	0.994	0.001
austrina_63	76	4.118	4.313	500	0.995	25	4.28	0.994	0.001
austrina_64	76	4.080	4.326	500	0.995	25	4.25	0.994	0.001
austrina_65	76	4.132	4.307	500	0.995	25	4.10	0.994	0.001
austrina_66	76	3.999	4.223	500	0.994	25	4.21	0.994	0.001
austrina_67	76	4.298	4.476	500	0.995	25	4.23	0.995	0.001
austrina_68	76	4.129	4.323	500	0.995	25	4.28	0.994	0.001
austrina_69	76	3.934	4.179	500	0.994	25	4.09	0.992	0.003
austrina_70	76	4.025	4.241	500	0.994	25	4.27	0.995	0.001
austrina_71	76	4.147	4.298	500	0.994	25	3.95	0.979	0.016
austrina_72	76	3.974	4.216	500	0.994	25	4.39	0.995	0.001
austrina_73	76	4.142	4.334	500	0.995	25	4.47	0.995	0.001
austrina_74	76	4.091	4.305	500	0.994	25	4.20	0.994	0.001
austrina_75	76	4.183	4.328	500	0.995	25	4.30	0.995	0.001
austrina_76	76	3.919	4.198	500	0.994	25	4.12	0.992	0.003
austrina_77	76	4.050	4.240	500	0.994	25	3.86	0.988	0.005

austrina_78	76	4.255	4.424	500	0.995	25	4.05	0.983	0.011
austrina_79	76	4.143	4.299	500	0.995	25	4.48	0.996	0.001
austrina_80	76	4.148	4.333	500	0.995	25	3.92	0.980	0.015
austrina_81	76	4.034	4.243	500	0.995	25	4.32	0.995	0.001
austrina_82	76	4.024	4.279	500	0.994	25	4.17	0.992	0.003
austrina_83	76	4.085	4.293	500	0.994	25	3.65	0.987	0.004
austrina_84	76	4.142	4.305	500	0.995	25	3.56	0.967	0.019
austrina_85	76	4.108	4.259	500	0.994	25	3.90	0.983	0.011
austrina_86	76	4.181	4.314	500	0.994	25	4.44	0.995	0.001
austrina_87	76	4.239	4.355	500	0.995	25	3.90	0.993	0.001
austrina_88	76	4.061	4.312	500	0.995	25	4.08	0.993	0.001
austrina_89	76	4.164	4.303	500	0.993	25	4.38	0.995	0.001
austrina_90	76	4.292	4.417	500	0.995	25	2.99	0.945	0.032
austrina_91	76	4.207	4.399	500	0.995	25	4.35	0.994	0.001
austrina_92	76	4.264	4.412	500	0.995	25	4.29	0.994	0.001
austrina_93	76	3.973	4.193	500	0.993	25	4.23	0.994	0.001
austrina_94	76	4.143	4.351	500	0.995	25	3.81	0.977	0.016
austrina_95	76	4.008	4.241	500	0.994	25	4.37	0.995	0.001
austrina_96	76	4.050	4.219	500	0.993	25	4.43	0.996	0.001
austrina_97	76	4.259	4.390	500	0.995	25	3.51	0.965	0.020
austrina_98	76	3.905	4.193	500	0.993	25	4.12	0.991	0.005
austrina_99	76	4.109	4.300	500	0.995	25	4.37	0.995	0.001
austrina (average)	76	4.102	4.298	500	0.994	25	4.17	0.991	0.004
balfouriana_ 0	37	4.755	4.978	500	0.997	12	4.94	0.998	0.001
Balfouriana_ 1	37	4.608	4.858	500	0.997	12	5.06	0.997	0.002
Balfouriana_	37	4.471	4.747	500	0.997	12	4.72	0.996	0.002

2									
Balfouriana_3	37	4.616	4.856	500	0.997	12	5.33	0.999	0.000
balfouriana_4	37	4.931	5.153	500	0.998	12	4.74	0.996	0.002
balfouriana_5	37	4.727	4.970	500	0.997	12	4.94	0.997	0.001
balfouriana_6	37	4.883	5.098	500	0.998	12	4.13	0.993	0.003
balfouriana_7	37	5.017	5.232	500	0.998	12	4.46	0.996	0.001
balfouriana_8	37	4.707	4.929	500	0.997	12	5.00	0.998	0.001
balfouriana_9	37	4.670	4.910	500	0.997	12	5.23	0.998	0.000
Balfouriana_10	37	4.802	5.069	500	0.998	12	4.66	0.997	0.001
balfouriana_11	37	4.504	4.776	500	0.997	12	5.23	0.998	0.000
balfouriana_12	37	4.712	4.934	500	0.997	12	4.92	0.997	0.001
balfouriana_13	37	4.855	5.071	500	0.998	12	4.96	0.998	0.001
balfouriana_14	37	4.694	4.948	500	0.998	12	5.03	0.998	0.001
balfouriana_15	37	4.773	4.992	500	0.997	12	5.07	0.998	0.001
balfouriana_16	37	4.855	5.068	500	0.998	12	5.24	0.998	0.001
balfouriana_17	37	4.561	4.796	500	0.996	12	5.17	0.998	0.001

balfouriana_18	37	4.789	5.035	500	0.998	12	5.07	0.998	0.001
balfouriana_19	37	4.634	4.887	500	0.997	12	5.17	0.998	0.001
balfouriana_20	37	4.783	5.010	500	0.997	12	5.22	0.998	0.001
balfouriana_21	37	4.734	4.962	500	0.997	12	4.77	0.997	0.001
balfouriana_22	37	4.957	5.168	500	0.998	12	3.87	0.991	0.005
balfouriana_23	37	4.821	5.059	500	0.998	12	5.26	0.998	0.001
balfouriana_24	37	4.808	5.033	500	0.998	12	4.54	0.997	0.001
balfouriana_25	37	4.613	4.871	500	0.997	12	4.92	0.998	0.001
balfouriana_26	37	4.889	5.106	500	0.998	12	4.84	0.997	0.001
balfouriana_27	37	4.576	4.809	500	0.997	12	4.77	0.997	0.001
balfouriana_28	37	4.584	4.849	500	0.997	12	4.76	0.997	0.001
balfouriana_29	37	4.806	5.033	500	0.998	12	4.53	0.994	0.003
balfouriana_30	37	4.835	5.052	500	0.998	12	4.75	0.997	0.001
balfouriana_31	37	4.773	4.990	500	0.997	12	5.12	0.998	0.001
balfouriana_32	37	4.739	4.959	500	0.997	12	4.98	0.998	0.001
balfouriana_	37	4.686	4.935	500	0.997	12	4.86	0.997	0.001

33									
balfouriana_34	37	4.537	4.815	500	0.997	12	4.62	0.996	0.001
balfouriana_35	37	4.575	4.814	500	0.997	12	5.16	0.998	0.001
balfouriana_36	37	4.850	5.088	500	0.998	12	4.93	0.998	0.001
balfouriana_37	37	4.512	4.754	500	0.997	12	5.03	0.998	0.001
balfouriana_38	37	4.587	4.848	500	0.997	12	5.05	0.998	0.001
balfouriana_39	37	4.951	5.153	500	0.998	12	4.43	0.996	0.001
balfouriana_40	37	4.839	5.075	500	0.998	12	4.29	0.993	0.004
balfouriana_41	37	4.610	4.858	500	0.997	12	5.36	0.999	0.000
balfouriana_42	37	5.051	5.277	500	0.998	12	3.95	0.996	0.001
balfouriana_43	37	4.946	5.180	500	0.998	12	5.09	0.998	0.001
balfouriana_44	37	4.666	4.925	500	0.997	12	5.11	0.998	0.001
balfouriana_45	37	4.825	5.066	500	0.998	12	5.29	0.998	0.001
balfouriana_46	37	4.647	4.900	500	0.997	12	5.14	0.998	0.001
balfouriana_47	37	4.833	5.080	500	0.998	12	5.30	0.998	0.001
balfouriana_48	37	4.556	4.787	500	0.997	12	4.72	0.997	0.001

balfouriana_49	37	4.708	4.955	500	0.998	12	5.01	0.995	0.003
balfouriana_50	37	4.886	5.111	500	0.998	12	5.11	0.998	0.001
balfouriana_51	37	4.817	5.052	500	0.998	12	4.56	0.997	0.001
balfouriana_52	37	4.704	4.976	500	0.998	12	4.97	0.998	0.001
balfouriana_53	37	4.490	4.766	500	0.997	12	4.76	0.997	0.001
balfouriana_54	37	4.944	5.173	500	0.998	12	4.56	0.994	0.004
balfouriana_55	37	4.552	4.781	500	0.997	12	4.66	0.997	0.001
balfouriana_56	37	4.550	4.797	500	0.997	12	4.61	0.995	0.003
balfouriana_57	37	4.882	5.106	500	0.998	12	5.24	0.998	0.000
balfouriana_58	37	4.790	5.025	500	0.998	12	5.12	0.998	0.001
balfouriana_59	37	5.004	5.230	500	0.998	12	4.05	0.992	0.005
balfouriana_60	37	4.873	5.091	500	0.998	12	5.20	0.998	0.001
balfouriana_61	37	4.866	5.103	500	0.998	12	5.43	0.999	0.000
balfouriana_62	37	4.628	4.881	500	0.997	12	5.29	0.998	0.000
balfouriana_63	37	4.867	5.089	500	0.998	12	5.07	0.998	0.001
balfouriana_	37	4.799	5.033	500	0.998	12	5.04	0.998	0.001

64									
balfouriana_65	37	4.954	5.181	500	0.998	12	4.78	0.997	0.001
balfouriana_66	37	4.794	5.038	500	0.998	12	5.17	0.998	0.001
balfouriana_67	37	4.509	4.777	500	0.997	12	5.09	0.998	0.001
balfouriana_68	37	4.477	4.753	500	0.997	12	4.79	0.997	0.001
balfouriana_69	37	4.502	4.782	500	0.997	12	5.12	0.998	0.001
balfouriana_70	37	5.046	5.254	500	0.998	12	4.04	0.992	0.005
balfouriana_71	37	4.586	4.866	500	0.997	12	4.94	0.997	0.001
balfouriana_72	37	4.789	5.000	500	0.997	12	4.47	0.996	0.001
balfouriana_73	37	4.827	5.041	500	0.997	12	4.74	0.997	0.001
balfouriana_74	37	4.534	4.805	500	0.997	12	4.79	0.996	0.002
balfouriana_75	37	4.893	5.131	500	0.998	12	4.74	0.997	0.001
balfouriana_76	37	4.757	4.994	500	0.998	12	4.60	0.994	0.004
balfouriana_77	37	5.037	5.254	500	0.998	12	4.80	0.997	0.001
balfouriana_78	37	4.790	5.025	500	0.998	12	5.24	0.998	0.001
balfouriana_79	37	4.655	4.920	500	0.997	12	4.66	0.997	0.001

balfouriana_80	37	4.691	4.907	500	0.997	12	5.07	0.998	0.001
balfouriana_81	37	4.554	4.826	500	0.997	12	5.08	0.998	0.001
balfouriana_82	37	4.437	4.740	500	0.997	12	4.74	0.997	0.001
balfouriana_83	37	4.786	5.029	500	0.998	12	5.18	0.998	0.001
balfouriana_84	37	4.454	4.776	500	0.997	12	5.01	0.997	0.001
balfouriana_85	37	4.895	5.097	500	0.998	12	4.10	0.995	0.002
balfouriana_86	37	4.520	4.789	500	0.997	12	5.14	0.998	0.001
balfouriana_87	37	4.671	4.897	500	0.997	12	4.89	0.996	0.003
balfouriana_88	37	4.861	5.104	500	0.998	12	5.05	0.997	0.001
balfouriana_89	37	4.384	4.708	500	0.997	12	5.03	0.998	0.001
balfouriana_90	37	4.527	4.789	500	0.996	12	5.21	0.998	0.000
balfouriana_91	37	4.540	4.775	500	0.996	12	5.27	0.998	0.000
balfouriana_92	37	4.845	5.073	500	0.998	12	4.68	0.994	0.004
balfouriana_93	37	4.800	5.025	500	0.998	12	5.21	0.998	0.001
balfouriana_94	37	4.878	5.114	500	0.998	12	5.11	0.998	0.001
balfouriana_	37	4.832	5.045	500	0.998	12	4.40	0.996	0.001

95									
balfouriana_96	37	4.783	4.997	500	0.998	12	4.62	0.994	0.004
balfouriana_97	37	4.508	4.790	500	0.997	12	5.19	0.998	0.001
balfouriana_98	37	4.689	4.939	500	0.997	12	5.30	0.998	0.000
balfouriana_99	37	4.847	5.085	500	0.998	12	4.83	0.997	0.001
balfouriana (average)	37	4.732	4.973	500	0.997	12	4.89	0.997	0.001

Appendix 3B: Maxent Percent Contribution Scores for 21,000 Years Ago

#Background points	Bio1	Bio2	Bio3	Bio4	Bio5	Bio6	Bio7	Bio8	Bio9	Bio10	Bio11	Bio12	Bio13	Bio14	Bio15	Bio16	Bio17	Bio18	Bio19
10074	1.87	13.30	5.90	0.00	38.89	2.64	0.00	0.29	0.06	1.66	0.00	1.06	0.08	2.69	10.15	4.77	2.78	0.81	13.05
10075	0.01	15.34	1.91	0.00	40.21	4.57	0.45	0.03	0.03	0.54	3.95	1.87	0.00	1.98	7.72	2.73	4.49	0.74	13.41
10075	1.15	18.46	0.37	0.00	45.83	2.03	0.00	0.07	0.01	0.89	4.97	0.55	0.00	4.11	3.19	0.10	4.81	0.01	13.48
10075	0.00	14.94	1.86	0.00	41.91	4.68	0.45	0.07	0.05	1.52	4.05	2.20	0.00	2.04	7.73	1.53	3.94	0.24	12.78
10075	0.14	16.16	1.79	0.00	37.29	4.99	0.11	0.08	0.00	1.57	4.60	2.51	0.12	2.92	7.11	2.00	4.50	0.29	13.81
10074	0.00	12.29	4.43	0.00	43.89	4.59	0.00	0.13	0.02	2.39	0.00	0.10	0.70	2.83	10.56	2.06	4.13	0.92	10.95
10075	0.00	12.77	1.98	0.02	42.35	4.98	0.46	0.07	0.03	1.62	3.96	2.05	0.00	2.77	10.70	2.92	1.76	1.14	10.43
10076	0.00	13.20	3.80	0.00	43.23	1.73	0.00	0.11	0.07	2.50	2.97	0.44	0.00	3.28	8.73	3.52	4.28	0.32	11.80
10076	0.70	18.26	1.46	0.00	42.85	6.48	0.00	0.07	0.05	0.18	0.04	1.32	0.00	3.14	5.49	2.89	3.04	0.98	13.05
10076	0.00	13.95	3.18	0.00	44.67	5.43	0.00	0.14	0.04	1.44	0.04	1.01	0.00	2.61	8.33	3.97	3.23	0.05	11.91
10075	0.00	13.39	5.26	0.00	37.44	0.18	0.00	0.00	0.06	0.99	4.39	1.72	0.28	2.57	5.49	4.68	4.21	0.40	18.94
10075	0.35	13.55	4.61	0.00	37.72	3.15	0.00	0.14	0.06	0.00	3.63	1.01	0.01	2.84	11.93	5.21	3.41	1.35	11.04
10076	2.76	15.96	3.27	0.00	46.74	4.74	0.13	0.14	0.05	0.54	0.02	0.79	0.00	1.65	9.96	1.43	5.51	0.40	5.90
10075	0.53	15.98	3.43	0.00	40.25	2.22	0.00	0.01	0.08	0.68	3.58	0.57	0.01	3.10	7.23	3.24	4.12	0.39	14.57
10075	0.00	14.03	4.03	0.02	39.41	1.97	0.01	0.00	0.01	2.82	3.21	1.17	0.05	2.24	6.83	3.40	4.62	0.26	15.93
10076	1.35	13.64	3.57	0.00	40.52	2.15	0.00	0.72	0.00	0.00	3.85	2.11	0.01	2.51	9.53	2.82	4.92	0.79	11.51
10075	0.00	14.50	3.00	0.00	36.69	7.97	0.00	0.10	0.01	2.42	0.04	2.92	0.39	2.34	10.03	2.26	3.31	1.19	12.82

10076	0.00	10.25	2.52	0.00	43.70	3.25	0.00	3.51	0.07	3.34	0.11	1.25	0.43	3.02	9.17	3.36	2.47	0.89	12.65
10075	0.00	7.01	7.75	0.00	36.69	5.12	0.00	0.02	0.09	2.54	0.00	1.31	0.03	3.33	15.10	4.29	3.08	1.08	12.55
10076	0.00	12.48	4.69	0.00	43.44	2.17	0.00	0.00	0.07	0.24	3.27	0.55	0.76	3.14	10.01	2.97	2.47	0.45	13.28
10074	0.00	15.99	2.09	0.00	38.08	5.56	0.16	0.12	0.03	0.05	4.70	1.78	0.00	2.42	9.29	2.13	4.18	1.43	12.01
10075	0.47	13.05	1.86	0.00	38.22	8.81	0.00	0.12	0.00	0.00	0.02	1.80	0.11	2.56	10.24	4.67	4.19	1.05	12.83
10076	0.53	9.46	5.81	0.00	43.04	2.00	0.00	0.04	0.06	0.80	2.85	1.00	0.06	2.96	11.65	2.22	4.66	0.66	12.22
10075	0.47	14.76	2.90	0.00	38.95	3.93	0.00	0.07	0.05	0.00	3.76	0.92	0.03	2.48	9.23	3.24	4.70	1.33	13.18
10076	0.00	12.17	1.75	0.00	44.56	7.46	0.25	0.09	0.04	1.33	0.05	1.67	0.05	2.57	9.27	2.73	1.72	0.90	13.38
10075	0.00	14.99	2.40	0.00	41.55	4.86	0.46	0.44	0.05	0.00	4.07	1.20	0.00	1.85	8.48	1.83	6.35	0.38	11.07
10076	4.02	16.27	0.36	0.00	46.19	4.24	0.00	1.62	0.08	1.38	0.14	1.43	0.00	2.45	4.25	0.39	3.98	0.00	13.20
10076	2.02	12.89	3.04	0.00	44.45	1.74	0.00	0.02	0.00	0.02	3.04	0.93	0.00	3.25	7.88	3.78	2.69	0.85	13.38
10076	0.83	13.49	1.64	0.00	42.84	7.23	0.00	0.04	0.01	0.00	0.80	1.78	0.30	3.35	6.57	1.64	3.83	1.29	14.35
10075	0.00	13.65	2.08	0.00	39.82	4.46	0.49	0.14	0.02	0.10	3.64	3.19	0.02	2.07	9.98	3.91	3.93	0.51	12.01
10075	0.00	16.28	1.55	0.00	40.48	5.06	0.00	0.13	0.02	1.71	4.24	3.92	0.00	1.48	7.13	0.00	5.26	0.29	12.46
10076	0.00	10.78	4.72	0.00	38.81	5.18	0.00	0.01	0.20	0.28	0.00	0.86	0.03	3.33	12.59	5.61	2.43	1.05	14.13
10074	0.00	14.67	1.11	0.00	41.86	4.41	0.00	0.83	0.01	1.32	3.99	0.89	0.01	2.94	7.34	2.84	3.07	0.73	14.00
10075	0.00	15.04	3.69	0.00	44.84	1.74	0.00	0.07	0.07	1.82	3.23	1.60	0.00	2.07	6.26	0.92	5.21	0.12	13.32
10075	0.01	8.12	5.42	0.00	46.10	1.99	0.00	2.40	0.09	2.64	0.01	1.91	0.05	2.52	11.68	2.87	3.54	0.89	9.74
10076	0.00	11.94	3.99	0.00	46.40	1.76	0.20	0.05	0.05	2.10	2.98	0.17	0.30	2.76	7.51	2.15	4.60	0.27	12.78
10075	3.90	16.41	0.61	0.00	41.49	5.72	0.00	0.79	0.03	1.34	0.17	0.68	0.00	3.28	5.80	0.83	4.64	0.44	13.87
10076	0.00	10.49	2.15	0.00	48.41	4.57	0.36	0.14	0.03	0.36	3.21	1.32	0.00	2.13	9.68	1.03	5.25	0.69	10.16
10075	0.00	12.19	2.88	0.00	41.05	6.40	0.00	0.11	0.02	0.62	0.04	3.51	0.41	5.13	16.75	3.37	0.56	1.87	5.09
10074	0.86	14.68	1.44	0.00	38.26	6.73	0.00	0.07	0.04	1.25	0.11	2.69	0.00	5.00	8.94	1.66	3.77	1.92	12.58
10076	0.86	18.64	0.67	0.02	44.17	5.20	0.00	2.70	0.03	0.86	0.08	0.16	0.00	2.66	2.31	2.72	4.46	0.39	14.07
10076	0.06	11.50	3.39	0.00	43.14	5.10	0.00	0.13	0.05	2.45	0.02	2.14	0.01	2.98	10.61	3.59	3.23	1.00	10.61
10076	0.50	12.01	4.43	0.00	44.95	2.27	0.00	2.17	0.09	1.79	0.00	1.16	0.00	2.01	8.69	3.22	4.52	0.21	11.97
10076	0.00	13.01	4.35	0.02	43.81	2.54	0.00	0.01	0.05	0.25	3.24	0.30	0.00	3.16	7.82	2.60	4.49	0.83	13.51
10075	0.00	7.26	5.24	0.00	44.37	4.54	0.00	0.07	0.07	3.21	0.07	1.59	0.55	2.61	13.94	2.97	2.33	0.71	10.47
10076	0.33	12.19	4.41	0.00	44.48	1.57	0.01	0.00	0.14	0.00	2.89	1.12	0.08	3.08	7.93	2.93	4.58	0.32	13.93

10075	1.81	9.98	6.18	0.00	41.81	2.62	0.00	0.42	0.04	1.32	0.01	1.64	0.00	2.70	13.42	4.54	2.27	0.45	10.81
10075	0.75	19.10	1.19	0.00	40.02	8.26	0.00	0.05	0.02	0.08	0.42	1.02	0.00	2.01	5.86	2.71	4.68	0.45	13.38
10075	0.00	18.53	3.37	0.00	38.81	6.03	0.00	0.01	0.00	1.82	0.44	0.78	0.07	2.09	4.57	2.87	4.48	0.57	15.56
10076	0.05	14.40	1.14	0.00	41.25	5.00	0.48	0.09	0.05	0.88	4.81	2.27	0.00	1.92	7.56	1.77	5.38	0.29	12.65
10076	0.00	18.69	1.66	0.00	41.77	8.83	0.00	0.12	0.09	0.00	0.71	1.30	0.00	1.26	5.21	0.69	6.66	0.07	12.93
10076	0.01	12.48	1.24	0.00	46.48	1.85	0.00	1.58	0.04	0.42	3.90	3.35	0.00	3.41	8.68	2.96	1.90	0.56	11.15
10075	0.00	14.80	1.75	0.00	35.82	9.86	0.18	0.05	0.02	0.00	0.03	1.93	0.24	4.17	9.50	3.27	3.51	1.33	13.54
10075	0.00	16.57	2.12	0.00	32.74	6.07	0.00	0.75	0.00	0.45	4.97	1.80	0.05	1.68	10.18	3.27	6.26	0.68	12.42
10075	0.00	18.00	1.92	0.00	39.15	4.41	0.00	0.02	0.02	1.26	3.90	1.63	0.03	2.86	5.01	1.66	5.16	0.87	14.12
10076	0.21	20.10	3.06	0.02	37.65	5.68	0.00	0.05	0.02	0.78	0.00	1.47	0.04	3.31	3.88	1.83	6.43	0.30	15.16
10074	0.66	8.83	6.19	0.00	40.21	2.46	0.00	0.06	0.05	3.51	0.00	1.19	0.65	3.22	13.02	5.33	1.50	1.47	11.64
10076	0.74	14.45	1.00	0.00	42.91	4.25	0.00	0.60	0.01	0.00	4.10	1.26	0.00	2.71	7.63	1.68	4.91	0.90	12.87
10075	0.50	12.79	4.00	0.00	38.97	2.34	0.00	0.07	0.04	0.55	3.56	0.67	0.04	3.41	11.07	6.37	1.42	2.22	11.97
10076	0.01	15.94	1.56	0.00	35.02	5.38	0.11	0.05	0.07	1.50	4.64	0.74	0.34	1.63	7.20	3.24	5.96	0.40	16.21
10076	0.00	14.68	3.53	0.00	43.32	1.60	0.00	0.00	0.06	3.49	3.17	0.20	0.01	1.98	6.25	1.54	5.95	0.11	14.10
10075	0.01	13.02	1.44	0.00	44.12	6.68	0.00	1.03	0.04	3.46	0.10	1.95	0.00	3.22	7.81	1.04	2.89	1.15	12.03
10075	0.02	13.73	4.40	0.00	47.39	2.48	0.00	0.81	0.09	2.27	0.00	0.12	0.01	1.89	6.83	2.27	4.37	0.21	13.10
10075	0.00	12.03	3.56	0.00	42.20	5.25	0.00	0.35	0.02	3.21	0.07	1.57	0.01	3.34	10.24	3.33	3.18	0.62	11.03
10075	1.38	12.85	2.23	0.00	38.61	5.88	0.00	0.41	0.02	0.14	3.90	2.67	0.12	2.46	10.37	1.82	4.54	1.07	11.53
10076	0.00	16.04	1.83	0.00	36.32	5.82	0.13	0.12	0.02	1.34	4.48	3.15	0.02	2.43	9.45	2.96	2.66	1.12	12.13
10076	0.00	7.91	4.32	0.00	47.67	1.74	0.00	0.09	0.03	3.20	2.69	1.19	0.00	3.01	12.57	3.88	0.31	0.81	10.57
10074	0.17	15.60	0.50	0.00	41.14	9.12	0.00	0.06	0.06	1.06	0.11	1.39	0.01	2.95	6.14	0.91	5.43	1.60	13.75
10075	1.62	13.83	1.49	0.01	45.65	3.46	0.00	0.09	0.02	0.06	3.25	1.03	0.01	3.57	7.28	2.88	2.73	0.27	12.74
10074	0.00	12.20	6.67	0.00	42.50	0.15	0.00	0.24	0.21	0.45	2.66	0.34	0.11	2.48	9.48	3.25	4.69	0.32	14.24
10075	1.96	13.18	3.28	0.01	38.14	4.72	0.00	0.01	0.06	0.72	0.00	1.24	0.01	3.23	10.24	5.13	1.76	2.34	13.97
10075	0.00	18.58	1.74	0.00	41.68	7.89	0.00	0.11	0.02	0.10	0.34	0.60	0.00	3.68	6.08	3.05	3.57	0.15	12.42
10076	0.00	10.15	3.62	0.00	38.28	6.35	0.00	0.09	0.11	3.36	0.02	1.19	0.05	3.32	13.13	5.25	2.04	0.67	12.39
10076	0.90	14.67	1.35	0.00	45.70	3.99	0.00	0.11	0.00	0.00	3.98	2.09	0.01	2.28	7.65	1.64	4.28	0.14	11.21
10076	0.10	11.96	2.87	0.00	41.52	5.76	0.00	0.00	0.02	0.00	1.80	2.08	0.12	3.08	7.73	3.78	3.07	0.37	15.74

10074	0.00	16.77	1.85	0.00	40.70	4.84	0.00	0.08	0.05	1.02	3.83	2.03	0.00	2.10	6.57	0.69	7.18	0.09	12.19
10075	0.00	10.12	6.28	0.00	34.36	6.24	0.00	0.88	0.00	1.32	0.00	2.09	0.05	3.51	14.93	4.67	1.82	2.55	11.18
10075	0.00	16.27	4.49	0.00	37.69	2.30	0.00	0.03	0.01	0.03	3.89	0.52	0.00	3.27	8.42	3.87	4.59	0.33	14.27
10073	3.53	14.78	1.04	0.00	40.96	5.72	0.00	0.63	0.03	0.55	0.08	1.40	0.02	2.30	6.16	0.83	6.37	0.42	15.20
10076	0.61	16.97	1.47	0.00	44.34	7.20	0.00	0.14	0.03	0.69	0.03	0.78	1.26	3.62	7.01	1.65	2.62	0.12	11.47
10076	0.46	13.72	1.58	0.00	42.08	5.46	0.48	0.10	0.00	0.08	4.37	1.73	0.02	1.81	8.88	0.85	5.76	1.09	11.53
10075	0.00	11.40	4.31	0.00	44.51	2.43	0.00	0.72	0.15	2.86	0.00	1.83	0.06	2.83	5.00	2.82	3.81	0.28	16.98
10076	0.00	11.44	4.23	0.00	38.71	5.10	0.00	0.30	0.15	2.28	0.01	1.07	0.12	3.49	9.68	4.18	3.72	1.24	14.29
10076	0.00	12.63	3.99	0.01	43.12	1.89	0.00	0.03	0.08	2.71	3.12	1.85	0.00	1.97	8.82	2.84	4.04	0.10	12.81
10076	0.03	15.04	1.34	0.00	43.12	5.66	0.00	0.86	0.01	0.59	0.07	1.79	0.00	3.65	8.15	1.97	5.51	0.29	11.91
10076	0.00	13.81	3.99	0.00	40.09	1.99	0.00	0.00	0.02	2.95	3.21	0.41	0.05	2.80	8.03	2.95	3.55	0.14	16.02
10076	0.00	14.37	1.94	0.00	48.40	3.20	0.00	0.10	0.02	2.69	3.02	0.22	0.93	1.88	6.50	0.73	4.37	0.28	11.36
10076	0.09	15.37	0.88	0.00	45.80	3.68	0.00	0.05	0.07	3.00	3.48	0.51	0.31	3.19	4.42	0.52	4.85	0.00	13.80
10076	1.47	10.84	3.65	0.00	45.90	4.67	0.01	0.00	0.13	0.00	0.00	0.59	0.03	3.02	7.34	1.48	4.58	0.87	15.40
10075	0.00	18.65	1.67	0.01	42.36	5.82	0.00	0.02	0.02	1.70	2.08	0.39	0.03	1.71	5.01	1.65	5.48	0.23	13.18
10075	0.05	17.85	0.93	0.00	44.42	6.79	0.00	0.04	0.00	0.93	0.06	0.33	0.04	4.93	3.05	0.10	5.09	0.01	15.37
10076	0.53	12.49	1.42	0.00	45.64	7.01	0.00	0.03	0.06	0.92	0.10	0.84	0.52	2.67	6.20	0.70	5.49	0.68	14.71
10074	0.05	18.52	1.25	0.00	43.81	8.04	0.38	0.11	0.03	0.22	0.14	0.39	0.04	3.67	4.37	0.68	4.72	1.16	12.43
10076	0.00	12.34	4.03	0.00	44.56	1.89	0.00	0.06	0.04	1.93	3.68	1.70	0.01	2.31	9.51	1.71	4.65	0.82	10.77
10076	0.00	12.05	2.04	0.00	42.40	5.12	0.47	0.13	0.01	1.28	4.19	3.53	0.00	2.49	10.96	2.15	1.94	1.08	10.17
10076	0.00	12.66	1.65	0.00	43.67	5.70	0.00	0.09	0.15	2.28	0.00	0.89	0.00	1.98	9.54	4.99	3.33	0.49	12.59
10076	0.16	14.28	4.14	0.00	41.47	5.03	0.00	0.03	0.06	1.79	0.00	1.19	0.00	3.15	8.12	1.86	5.39	0.30	13.01
10076	3.58	13.95	0.84	0.00	44.78	3.82	0.00	1.84	0.01	0.89	0.06	1.01	0.02	3.04	4.88	1.89	4.26	0.16	14.94
10074	0.00	8.66	7.61	0.00	37.28	5.88	0.00	0.50	0.04	0.00	0.08	1.56	0.02	3.78	19.23	5.06	2.92	2.06	5.31
10075	0.00	15.53	3.22	0.00	37.37	5.00	0.01	0.11	0.01	1.16	4.17	0.78	0.00	2.47	10.08	2.33	5.83	0.50	11.44
10075.34	0.45	13.87	2.92	0.00	41.78	4.55	0.06	0.32	0.05	1.23	1.92	1.38	0.10	2.79	8.52	2.64	4.01	0.70	12.72
10037	6.21	0.04	6.01	0.05	2.82	7.21	0.00	0.00	1.93	17.14	0.74	2.07	0.01	3.39	0.50	1.61	6.66	0.03	43.57
10037	0.56	0.11	6.95	0.26	2.72	12.46	0.00	0.00	0.00	14.73	0.74	0.14	0.02	6.70	0.56	3.21	4.11	0.10	46.63
10037	0.46	0.11	6.81	0.26	0.90	12.86	0.00	0.00	0.02	14.46	0.64	0.09	0.01	7.83	0.86	0.18	3.32	0.03	51.17

10037	0.19	1.28	10.28	0.26	0.00	12.72	0.00	0.00	0.16	14.91	0.83	0.00	0.13	1.98	0.15	2.08	7.41	0.03	47.59
10037	8.23	0.03	3.40	2.76	0.07	6.20	0.00	0.00	2.93	17.40	0.46	0.10	0.07	1.92	0.26	8.21	8.54	0.01	39.41
10037	1.31	0.34	3.64	0.71	0.00	10.70	0.33	0.00	1.93	17.30	0.54	0.20	0.32	7.56	0.23	9.12	5.22	0.02	40.53
10037	5.48	0.36	1.30	3.22	0.01	7.54	0.00	0.35	2.72	18.24	0.41	0.00	0.03	2.68	0.09	18.76	8.49	0.00	30.32
10037	8.99	1.84	4.92	0.00	0.23	6.25	0.22	0.00	2.14	17.98	0.42	1.45	0.18	4.78	0.16	5.69	6.51	0.00	38.25
10037	1.53	0.02	7.92	0.49	0.00	11.09	0.00	0.00	0.02	17.37	1.46	0.09	0.19	7.81	0.19	4.04	2.95	0.03	44.81
10037	2.84	0.02	7.08	0.02	1.90	10.92	0.00	0.00	0.11	17.40	0.86	0.19	0.01	4.43	0.73	1.68	5.87	0.05	45.90
10037	3.87	0.42	7.25	0.53	0.01	10.06	0.00	0.00	0.10	17.55	0.63	0.00	0.00	1.92	0.50	7.22	8.94	0.02	41.00
10037	0.76	0.15	7.41	0.26	1.21	11.95	0.00	0.00	0.00	15.82	1.72	0.13	0.04	2.06	0.45	1.50	9.16	0.05	47.34
10037	1.53	0.05	3.51	2.23	4.74	10.95	0.12	0.22	0.00	15.43	0.66	0.06	0.08	1.68	0.26	4.55	8.53	0.00	45.39
10037	9.97	0.15	7.29	0.69	0.00	6.74	2.16	0.00	0.29	13.63	0.29	0.11	0.21	3.07	0.00	5.06	7.47	0.03	42.84
10037	0.26	0.17	5.24	1.13	3.69	10.38	0.00	0.06	0.00	16.42	0.97	0.17	0.02	5.36	0.52	3.17	7.85	0.03	44.57
10037	9.12	0.04	5.44	0.15	0.00	5.18	0.00	0.00	2.87	17.44	0.41	0.07	0.01	4.44	0.75	3.19	6.38	0.01	44.51
10037	5.69	0.11	5.04	0.61	1.76	8.63	2.42	0.00	1.90	13.62	0.86	1.85	0.20	1.67	0.03	15.99	9.13	0.01	30.49
10037	0.98	0.04	4.28	0.34	2.03	10.14	0.00	0.00	0.00	18.47	0.66	1.15	0.17	6.13	0.24	1.27	5.19	0.02	48.90
10037	7.53	0.00	4.92	0.21	3.12	8.09	0.00	0.00	1.30	19.71	0.31	0.20	0.08	2.97	0.30	18.75	3.61	0.05	28.85
10037	0.68	0.10	5.20	0.06	0.32	10.30	0.00	0.00	2.61	19.02	1.12	0.27	0.03	3.99	0.72	0.01	6.87	0.03	48.69
10037	2.20	0.01	2.57	0.00	0.00	10.38	0.29	0.00	5.25	20.64	0.44	0.05	0.01	3.79	0.55	2.26	5.17	0.04	46.35
10037	3.70	0.21	6.77	0.05	0.00	9.06	0.00	0.00	4.49	15.60	0.73	0.11	0.00	6.84	0.42	5.25	2.98	0.01	43.79
10037	12.06	0.01	3.04	0.05	0.12	3.47	0.54	0.16	4.35	14.65	0.31	0.15	0.01	3.38	0.38	8.30	10.23	0.00	38.78
10037	8.66	0.17	3.05	2.03	1.76	6.34	0.01	0.00	1.73	15.99	0.47	0.03	0.00	3.18	0.66	8.17	8.54	0.01	39.18
10037	3.26	0.03	6.28	0.06	3.17	10.16	0.00	0.00	1.99	16.86	0.58	0.18	0.00	1.76	0.39	6.53	8.61	0.06	40.09
10037	0.50	0.12	6.66	0.08	0.01	11.93	0.00	0.00	1.98	14.04	0.78	0.01	0.05	7.95	0.28	4.77	4.33	0.03	46.48
10037	8.80	0.07	6.34	0.05	0.00	7.25	2.23	0.00	1.71	17.01	0.26	0.11	0.03	2.20	0.44	6.61	6.99	0.01	39.91
10037	0.39	0.05	10.28	0.28	2.56	12.96	0.00	0.00	0.04	14.98	1.30	0.05	0.01	1.67	0.55	0.00	5.91	0.02	48.96
10037	0.46	0.06	6.00	0.12	0.00	10.17	0.00	0.00	1.64	15.85	3.95	0.04	0.09	6.87	0.56	0.00	4.88	0.04	49.26
10037	3.12	0.11	7.92	0.09	1.39	10.07	0.00	0.00	0.00	18.70	0.68	0.14	0.01	1.43	0.25	9.28	9.07	0.03	37.71
10037	2.61	0.07	6.24	0.58	0.99	5.77	0.00	0.00	2.62	19.05	4.53	0.16	0.04	2.54	0.01	19.58	6.91	0.18	28.13
10037	5.30	0.03	4.22	0.17	0.12	8.78	0.00	0.05	0.02	16.79	0.68	0.00	0.13	6.36	0.32	6.42	8.35	0.04	42.22

10037	8.06	0.09	5.33	0.05	1.08	7.96	0.61	0.00	0.26	15.79	0.34	0.04	0.05	2.21	0.35	7.92	7.44	0.01	42.40
10037	1.40	0.04	5.24	0.04	1.27	6.48	0.00	0.00	2.35	21.82	4.03	0.30	0.00	2.35	0.59	0.06	7.54	0.08	46.43
10037	1.97	0.01	4.23	0.15	0.00	8.47	0.00	0.00	0.00	21.39	3.15	0.01	0.07	4.74	0.60	0.00	4.14	0.02	51.04
10037	1.58	0.15	4.96	0.60	1.77	11.37	2.57	0.20	0.11	13.88	0.66	1.78	0.26	1.98	0.06	1.79	8.62	0.02	47.65
10037	8.64	0.02	3.93	2.20	0.04	6.67	0.00	0.00	2.61	19.64	0.73	0.43	0.19	1.09	0.01	16.46	4.36	0.02	32.95
10037	1.70	0.15	8.70	0.39	1.49	12.40	0.11	0.00	0.00	14.10	0.95	1.37	0.20	7.73	0.28	0.00	1.57	0.01	48.87
10037	1.76	0.01	4.34	0.71	1.44	11.56	0.00	0.00	1.77	13.15	0.65	0.01	0.37	3.09	0.93	0.17	10.08	0.04	49.93
10037	1.82	0.03	4.96	0.44	1.29	8.00	0.06	0.00	6.09	19.66	0.32	0.00	0.01	1.05	0.13	15.18	8.15	0.02	32.77
10037	1.47	0.00	4.82	0.14	5.41	10.56	0.00	0.00	1.50	15.34	0.72	0.25	0.01	6.40	0.49	3.44	7.96	0.09	41.40
10037	0.72	0.13	6.20	0.74	3.15	10.25	0.00	0.00	0.00	17.75	0.43	0.12	0.11	4.80	0.41	1.54	6.76	0.01	46.89
10037	10.24	0.33	3.61	0.03	0.22	5.93	0.35	0.00	1.81	17.84	0.53	0.18	0.09	2.88	0.18	16.79	8.89	0.00	30.11
10037	12.90	0.01	3.09	0.08	0.08	3.34	0.30	0.00	2.80	16.82	0.19	1.20	0.01	6.56	0.36	6.48	5.75	0.00	40.02
10037	2.23	0.01	5.87	0.20	1.18	11.85	0.00	0.00	1.21	17.80	0.13	0.22	0.10	3.20	0.52	5.26	7.02	0.07	43.12
10037	3.16	0.03	4.47	0.06	2.81	7.73	0.00	0.00	2.97	18.19	3.84	0.44	0.13	3.00	0.24	14.16	7.74	0.01	31.01
10037	0.44	0.13	6.98	0.31	1.60	12.54	0.00	0.04	0.00	13.29	0.68	0.11	0.15	1.73	0.17	3.54	11.73	0.09	46.47
10037	2.67	0.01	4.97	0.23	3.71	8.07	0.00	0.00	0.01	20.50	4.53	2.68	0.08	1.72	0.60	4.92	3.71	0.02	41.59
10037	0.85	0.03	8.13	0.10	1.27	13.84	0.00	0.00	0.05	16.93	0.45	0.05	0.02	3.57	0.57	1.09	3.18	0.03	49.83
10037	3.07	0.07	7.27	0.14	2.83	10.18	2.54	0.00	0.00	15.01	0.61	1.21	0.24	1.36	0.09	4.90	8.29	0.05	42.13
10037	7.11	0.20	4.14	0.20	2.69	8.63	0.00	0.00	0.00	16.76	0.08	0.00	0.00	3.72	0.38	7.48	7.87	0.01	40.72
10037	1.07	0.18	5.31	0.59	0.00	7.83	0.00	0.00	2.07	20.94	4.02	0.01	0.07	2.04	0.48	6.50	8.49	0.01	40.39
10037	1.79	0.39	6.01	0.76	2.44	11.42	0.00	0.00	1.17	14.48	1.17	0.18	0.12	3.27	0.86	3.64	9.18	0.02	43.11
10037	0.71	0.10	6.62	0.20	0.00	8.74	0.00	0.00	3.39	15.44	5.60	0.21	0.01	6.04	0.64	0.00	4.19	0.05	48.07
10037	4.34	0.03	5.54	0.78	5.22	8.78	0.00	0.00	1.11	14.05	0.59	0.01	0.13	2.67	0.21	6.67	9.84	0.05	39.99
10037	2.59	0.02	6.06	2.47	0.00	9.95	0.00	0.00	0.00	18.29	0.76	2.57	0.01	2.67	0.53	0.14	7.49	0.03	46.41
10037	1.55	0.05	7.30	0.06	1.33	10.88	0.12	0.00	0.00	17.17	0.96	1.45	0.04	2.59	0.69	0.64	7.86	0.04	47.29
10037	9.52	0.31	6.17	0.28	0.00	5.33	0.00	0.00	2.10	18.26	0.02	0.22	0.06	1.88	0.12	7.17	8.34	0.03	40.19
10037	4.30	0.09	6.82	0.11	3.24	10.45	0.00	0.00	1.35	15.72	0.59	0.07	0.00	1.73	0.34	5.46	8.63	0.08	41.01
10037	12.27	0.44	3.36	0.18	0.08	3.82	0.00	0.00	3.75	16.27	0.07	0.24	0.01	3.32	0.27	19.49	8.90	0.00	27.53
10037	4.91	0.30	3.86	0.85	0.10	7.77	0.00	0.00	4.41	17.79	0.47	0.12	0.01	3.30	0.46	8.65	7.56	0.00	39.44

10037	2.08	0.08	2.80	0.52	0.00	10.55	0.00	0.00	7.07	15.80	0.45	0.08	0.01	4.78	0.64	16.27	6.90	0.00	31.95
10037	1.17	0.00	7.83	0.01	1.69	9.71	0.04	0.00	0.02	20.96	0.56	0.28	0.22	1.36	0.42	1.61	7.77	0.08	46.29
10037	1.19	0.06	4.90	0.53	3.89	11.15	0.00	0.00	0.00	17.37	0.37	0.05	0.05	2.33	0.29	9.39	10.52	0.03	37.89
10037	8.66	0.01	4.91	0.34	1.28	7.83	0.23	0.00	1.50	14.87	0.61	0.16	0.27	2.89	0.21	8.24	8.23	0.03	39.73
10037	4.99	0.04	3.36	0.52	4.87	7.72	0.00	0.33	1.11	14.11	1.14	0.29	0.50	2.13	0.06	16.07	12.93	0.01	29.82
10037	2.16	0.03	5.08	0.81	0.00	10.99	1.41	0.00	0.00	17.30	0.44	0.23	0.15	3.78	0.39	6.98	11.11	0.09	39.06
10037	2.02	0.02	5.94	0.07	0.00	11.66	0.00	0.00	1.80	16.36	0.56	0.30	0.17	2.43	0.49	0.01	8.01	0.04	50.11
10037	0.00	0.12	5.77	0.39	0.00	10.32	0.00	0.00	0.01	17.76	0.72	0.00	0.05	8.75	0.30	0.00	3.32	0.00	52.48
10037	1.07	0.00	7.97	0.02	0.00	12.45	0.00	0.00	0.00	17.57	1.01	0.29	0.00	1.93	0.70	2.13	7.42	0.13	47.34
10037	12.65	0.02	2.87	0.14	0.42	2.89	0.00	0.00	4.85	16.12	0.88	0.04	0.00	6.74	0.27	6.59	6.54	0.00	38.98
10037	1.72	0.01	5.92	0.06	0.16	12.36	0.00	0.00	0.01	14.75	0.84	0.07	0.02	10.15	1.06	0.00	2.68	0.05	50.13
10037	2.50	0.05	3.63	0.18	1.32	9.01	0.00	0.22	5.40	14.92	0.45	0.35	0.19	3.65	0.21	3.75	8.88	0.01	45.27
10037	3.81	0.01	4.22	0.85	2.59	9.57	1.52	0.00	0.05	17.86	0.65	0.29	0.20	4.16	0.26	1.40	5.97	0.04	46.55
10037	0.28	0.04	7.39	0.32	0.00	12.58	1.19	0.00	0.00	13.41	1.17	0.18	0.01	9.32	2.11	3.28	3.08	0.06	45.59
10037	5.42	0.13	2.95	1.90	0.04	7.48	0.00	0.00	0.06	23.65	3.17	1.70	0.20	1.91	0.04	17.49	5.09	0.00	28.77
10037	1.26	0.11	5.47	0.64	3.15	10.06	0.11	0.00	0.02	18.39	1.23	0.51	0.39	5.26	0.16	20.79	5.77	0.01	26.68
10037	12.75	0.00	1.72	0.56	0.01	3.61	0.00	0.00	4.44	16.11	0.30	0.21	0.12	5.91	0.29	26.18	7.31	0.00	20.48
10037	1.33	0.26	5.43	1.01	0.00	11.53	0.00	0.00	4.98	14.86	0.58	0.02	0.35	1.43	0.22	8.80	9.40	0.03	39.76
10037	1.44	0.00	7.12	0.02	1.63	13.08	0.00	0.00	0.00	15.50	0.45	0.08	0.06	4.42	1.06	0.06	5.87	0.05	49.16
10037	6.20	0.00	7.62	0.05	0.00	8.30	0.00	0.00	3.53	14.64	0.85	1.32	0.24	3.17	0.28	0.13	5.33	0.03	48.31
10037	1.10	0.11	4.37	0.38	0.00	9.21	0.00	0.00	2.64	18.98	1.42	0.16	0.03	6.58	0.87	1.33	5.62	0.06	47.13
10037	0.27	0.02	7.98	0.13	0.05	11.46	0.00	0.00	0.31	16.04	2.30	0.30	0.01	8.82	0.57	0.08	1.82	0.08	49.77
10037	6.17	0.13	4.41	3.02	2.56	8.29	0.00	0.00	0.26	16.12	0.41	0.03	0.18	1.69	0.53	7.00	8.91	0.01	40.28
10037	0.15	0.01	8.15	0.20	0.00	13.62	0.00	0.00	0.00	13.46	0.88	0.19	0.00	9.53	1.00	4.96	3.16	0.08	44.62
10037	4.31	0.03	4.48	0.07	0.04	4.34	0.00	0.00	3.48	23.07	3.40	0.10	0.23	2.65	0.31	16.12	7.07	0.00	30.29
10037	2.19	0.19	8.42	0.09	1.91	11.35	0.21	0.00	0.00	15.11	0.92	0.28	0.01	2.14	0.85	1.25	8.63	0.09	46.38
10037	0.32	1.04	9.38	0.00	0.18	12.83	0.00	0.00	0.00	15.43	0.66	0.13	0.04	3.06	0.51	1.96	8.38	0.08	45.99
10037	5.84	2.13	3.87	0.41	2.83	8.24	0.00	0.00	0.37	15.89	0.44	1.01	0.00	5.48	0.47	5.56	6.94	0.00	40.52
10037	0.07	0.04	5.82	0.27	0.00	10.44	0.00	0.00	0.34	17.02	3.96	0.31	0.04	7.79	0.60	0.02	3.37	0.08	49.80

10037	2.80	0.00	7.59	0.00	0.00	11.25	0.00	0.26	1.34	16.26	0.31	0.12	0.05	1.48	0.57	0.00	7.83	0.05	50.08
10037	1.53	0.03	5.99	0.06	1.10	10.98	0.00	0.00	1.57	16.81	1.02	0.12	0.03	2.00	0.37	0.02	8.06	0.02	50.29
10037	7.71	0.09	5.69	0.05	1.55	8.79	0.08	0.00	1.79	13.98	0.87	0.01	0.04	1.62	0.10	16.22	9.81	0.02	31.58
10037	2.44	0.16	2.80	0.99	0.00	9.45	0.00	0.00	1.88	19.92	0.74	0.00	0.11	4.33	0.31	19.04	6.96	0.00	30.86
10037	7.74	0.10	5.29	0.31	3.45	8.32	0.00	0.00	3.31	10.35	1.19	0.37	0.03	1.53	0.20	6.63	10.76	0.03	40.37
10037	0.82	0.18	5.72	0.27	3.19	11.22	0.00	0.00	2.11	17.76	0.64	0.00	0.02	2.12	0.09	19.56	7.50	0.00	28.79
10037	1.90	0.06	6.64	0.28	1.82	3.96	0.01	0.00	1.72	21.12	8.46	3.40	0.08	1.92	0.05	2.64	3.42	0.00	42.53
10037	0.26	0.10	7.17	0.17	0.00	9.77	0.00	0.00	0.00	18.04	0.90	2.02	0.01	9.61	0.61	0.00	3.41	0.00	47.93
10037	3.47	0.00	4.59	0.03	0.00	10.08	0.00	0.00	1.46	17.21	0.72	0.13	0.04	4.59	0.49	0.00	7.76	0.01	49.42
10037	6.16	0.14	3.03	1.11	2.53	7.73	0.00	0.00	2.13	17.11	0.43	0.00	0.03	5.15	0.55	7.91	7.05	0.04	38.90
10037	3.70	0.15	5.56	0.48	1.24	9.32	0.20	0.02	1.49	16.80	1.13	0.40	0.09	3.92	0.42	6.21	6.94	0.03	41.90

Appendix 3C: Maxent Permutation Importances for 21,000 Years Ago

Bio1	Bio2	Bio3	Bio4	Bio5	Bio6	Bio7	Bio8	Bio9	Bio10	Bio11	Bio12	Bio13	Bio14	Bio15	Bio16	Bio17	Bio18	Bio19
0.00	23.81	10.32	0.00	0.00	0.00	0.00	3.19	2.87	0.00	0.00	1.06	2.42	35.43	3.21	0.00	9.46	4.72	3.52
0.00	30.73	15.59	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	7.34	0.05	18.88	9.63	0.00	2.13	4.17	11.15
2.33	89.51	0.00	0.00	0.04	0.00	0.00	2.03	0.08	0.00	5.34	0.27	0.00	0.26	0.00	0.02	0.00	0.03	0.10
0.00	23.09	1.93	0.00	0.00	0.02	0.00	6.09	0.51	0.00	0.96	2.60	0.00	21.50	40.02	0.23	1.46	1.55	0.04
0.01	53.33	5.47	0.00	4.24	0.00	0.00	1.68	0.22	0.03	3.28	7.40	4.59	12.07	0.00	0.00	1.46	2.69	3.53
0.00	8.38	8.97	0.00	0.00	0.00	0.00	2.88	0.21	0.00	0.00	0.15	0.00	18.00	52.75	0.02	5.64	2.93	0.06
0.00	18.66	1.80	0.00	0.00	0.00	0.00	1.75	0.05	0.00	0.61	0.53	0.00	12.42	62.53	0.12	0.32	1.12	0.10
0.00	24.65	4.75	0.00	0.00	0.09	0.00	6.85	1.19	0.02	0.00	1.14	0.00	14.03	44.12	0.00	1.42	1.75	0.01
0.91	85.21	1.13	0.00	0.29	0.00	0.00	0.81	0.01	0.01	1.24	4.09	0.00	1.88	3.69	0.00	0.06	0.43	0.24
0.00	10.85	1.44	0.00	0.00	0.17	0.00	5.19	0.22	0.01	0.48	4.68	0.00	6.58	69.82	0.00	0.41	0.13	0.00
0.00	13.27	6.35	0.00	4.17	2.95	0.00	0.00	4.16	0.07	0.24	6.03	36.15	12.13	0.05	0.00	0.39	5.81	8.21
0.00	9.28	4.45	0.00	0.91	0.09	0.00	3.71	0.06	0.00	0.00	2.62	0.15	23.62	51.50	0.00	1.24	2.27	0.10
0.00	11.57	1.41	0.00	0.00	0.20	0.00	5.15	0.22	0.00	0.07	2.21	0.00	13.57	64.92	0.28	0.13	0.28	0.00
0.09	29.52	2.61	0.10	0.44	0.00	0.00	0.00	3.71	0.03	0.01	1.79	0.09	6.44	0.00	0.16	0.88	1.18	52.95
0.00	3.51	19.65	0.00	2.63	0.00	0.00	0.00	0.00	0.02	0.02	6.22	1.45	2.84	0.03	0.00	1.34	2.22	60.09
0.00	22.56	1.16	0.00	0.00	0.00	0.00	2.56	0.00	0.00	0.14	2.96	0.29	12.25	57.14	0.08	0.02	0.83	0.00
0.00	23.55	2.75	0.00	0.00	0.00	0.00	5.70	0.20	0.00	0.42	3.24	0.60	22.45	39.49	0.00	0.60	0.92	0.07

0.00	19.27	1.52	0.00	0.54	0.00	0.00	5.06	0.39	0.06	14.89	9.49	3.94	27.49	9.82	0.00	0.47	6.96	0.11
0.00	9.68	7.05	0.01	0.00	4.65	0.00	0.10	2.06	0.01	0.00	4.59	0.23	13.02	47.55	0.00	1.41	3.00	6.65
0.00	33.85	1.91	0.00	0.21	17.77	0.00	0.00	3.00	0.00	0.01	4.80	0.00	2.52	10.74	0.00	0.14	2.22	22.84
0.00	46.93	0.92	0.00	0.00	0.00	0.00	3.95	0.23	0.03	4.63	4.34	0.00	7.95	29.41	0.00	0.08	1.52	0.00
0.00	43.97	1.13	0.00	0.03	0.83	0.00	4.01	0.02	0.00	0.37	8.10	4.06	26.79	7.09	0.03	0.61	2.97	0.00
0.00	11.66	11.70	0.00	0.68	3.46	0.00	0.48	1.80	0.02	0.00	8.45	1.80	11.98	30.23	0.00	1.37	10.84	5.52
0.00	37.25	5.56	0.00	1.52	0.00	0.00	4.86	0.94	0.00	0.02	2.19	2.01	8.97	34.95	0.00	0.02	1.61	0.08
0.00	22.08	1.63	0.00	0.07	0.00	0.00	3.88	0.39	0.02	1.54	4.91	1.12	14.88	46.64	0.00	0.14	2.47	0.23
0.00	26.04	1.13	0.00	0.01	0.05	0.00	2.08	0.30	0.00	0.88	1.22	0.00	10.73	56.24	0.27	0.63	0.25	0.17
0.06	86.96	0.00	0.00	0.01	0.01	0.00	5.00	0.14	0.00	6.45	1.07	0.00	0.19	0.00	0.00	0.00	0.02	0.08
0.00	43.60	9.74	0.00	0.51	0.00	0.00	0.50	0.21	0.04	0.00	4.30	0.00	7.83	6.58	0.09	1.95	6.97	17.67
0.00	25.71	7.20	0.00	2.41	0.00	0.00	0.50	0.06	0.00	2.38	8.58	5.28	33.44	0.28	0.00	0.59	6.92	6.67
0.00	17.57	4.89	0.00	0.15	0.00	0.01	3.57	0.73	0.06	0.00	3.82	0.54	21.87	40.18	0.04	2.71	3.68	0.17
0.00	56.09	0.86	0.00	0.00	0.00	0.00	3.31	0.00	0.00	2.10	5.79	0.00	1.40	29.95	0.00	0.41	0.11	0.00
0.00	29.43	2.14	0.00	0.27	20.05	0.00	0.00	3.68	0.00	0.00	3.51	0.00	9.14	6.51	0.00	1.76	4.63	18.88
0.00	37.92	4.45	0.00	8.74	0.00	0.00	1.32	0.16	0.00	17.07	7.54	0.00	12.65	1.21	0.00	0.53	4.89	3.53
0.00	55.24	3.99	0.00	0.00	0.02	0.00	2.46	2.50	0.05	0.11	2.60	0.00	15.11	10.77	0.00	2.89	2.83	1.44
0.00	14.47	3.20	0.00	1.18	0.11	0.00	3.19	0.73	0.00	0.40	2.63	0.00	14.84	47.59	0.00	3.57	5.78	2.31
0.00	50.76	5.45	0.00	0.00	0.11	0.00	4.11	2.61	0.00	0.08	3.20	0.00	12.27	13.82	0.00	2.18	2.79	2.61
0.00	81.63	0.21	0.00	0.00	0.00	0.00	3.12	0.12	0.00	8.36	1.89	0.00	3.71	0.28	0.00	0.00	0.56	0.12
0.00	16.44	1.03	0.00	0.02	0.00	0.00	3.06	0.08	0.00	0.71	0.80	0.00	38.01	36.04	0.06	0.66	3.10	0.00
0.00	11.65	0.85	0.00	0.00	0.00	0.00	1.70	0.13	0.00	0.34	0.84	0.00	37.61	44.55	0.08	0.53	1.72	0.00
0.00	75.18	0.56	0.00	0.03	0.00	0.00	1.58	0.33	0.00	2.43	1.27	0.00	14.11	3.21	0.00	0.35	0.94	0.02
7.50	89.54	0.25	0.00	0.06	0.00	0.00	0.19	0.05	0.00	0.52	0.18	0.00	0.58	0.00	0.50	0.03	0.20	0.38
0.00	16.06	0.78	0.00	0.02	0.13	0.00	5.24	0.26	0.00	0.07	2.96	0.03	17.40	55.46	0.00	0.28	1.29	0.00
0.00	28.21	5.53	0.00	0.00	0.57	0.00	2.46	0.93	0.03	0.00	2.51	0.00	14.26	37.42	0.00	2.38	4.56	1.13
0.00	19.93	15.81	0.01	1.14	0.76	0.01	0.13	3.53	0.00	0.00	3.67	0.00	18.98	13.20	0.00	2.87	5.17	14.79
0.00	8.63	3.73	0.00	0.89	0.00	0.00	0.57	0.47	0.01	0.99	2.15	0.00	7.14	67.39	0.00	2.12	4.93	0.99
0.00	50.37	2.58	0.00	0.00	13.34	0.00	0.00	6.84	0.00	0.03	5.11	1.46	3.86	6.48	0.00	0.32	0.82	8.79

0.00	26.52	2.13	0.00	3.70	0.60	0.00	0.13	0.54	0.00	0.00	0.95	0.00	1.87	53.52	0.06	2.33	2.99	4.65
0.00	65.19	1.71	0.00	0.08	0.00	0.00	1.36	0.34	0.02	3.84	2.84	0.00	2.81	0.00	0.02	0.60	0.89	20.29
0.00	27.86	4.82	0.01	0.00	0.00	0.00	0.03	0.00	0.05	0.00	5.45	0.99	4.61	0.53	0.00	0.51	1.41	53.73
0.00	62.52	0.66	0.00	0.32	0.00	0.00	2.77	0.31	0.01	13.95	6.10	0.00	8.36	1.91	0.03	0.12	2.25	0.70
0.00	42.46	0.81	0.00	0.00	0.08	0.00	5.46	0.12	0.00	2.89	6.20	0.00	1.67	37.91	1.84	0.49	0.06	0.01
0.00	35.92	0.81	0.00	0.00	0.00	0.00	4.90	0.30	0.02	0.20	1.43	0.00	16.61	37.66	0.33	0.01	1.82	0.00
0.00	34.74	1.30	0.00	0.00	1.14	0.00	3.46	0.13	0.00	0.78	5.93	3.89	34.63	7.48	0.25	0.42	5.78	0.07
0.00	21.99	2.65	0.00	0.60	0.00	0.00	1.73	0.02	0.03	2.70	3.95	0.40	15.06	48.07	0.00	1.51	1.30	0.00
0.00	37.78	4.96	0.00	3.24	0.00	0.00	0.23	0.29	0.04	3.49	11.79	0.68	4.34	0.29	0.00	0.44	0.43	32.01
0.00	38.30	5.38	0.28	0.00	0.00	0.00	0.00	0.00	0.05	0.00	8.27	3.27	4.35	0.42	0.00	2.14	0.67	36.87
0.00	16.58	4.45	0.00	1.90	0.29	0.00	0.70	1.05	0.02	0.00	3.24	0.00	21.74	34.28	0.00	7.79	4.21	3.76
0.00	60.23	0.46	0.00	0.10	0.23	0.00	0.88	0.13	0.00	3.01	3.87	0.00	15.27	13.38	0.00	0.26	1.85	0.34
0.00	13.84	6.14	0.00	0.01	0.62	0.00	0.24	1.02	0.00	0.05	2.07	0.80	13.68	57.04	0.00	0.83	3.51	0.15
0.00	64.46	2.49	0.00	0.41	0.00	0.00	1.03	0.62	0.12	2.20	7.92	3.59	11.81	0.00	0.00	1.29	1.11	2.93
0.00	26.07	2.40	0.01	1.11	0.01	0.00	0.00	6.15	0.00	0.04	1.94	0.00	9.43	0.00	0.02	0.93	0.31	51.57
0.06	54.10	4.48	0.00	4.38	0.11	0.00	0.88	0.76	0.09	4.68	6.30	0.00	13.39	1.76	0.00	1.24	5.75	2.03
0.00	21.42	5.52	0.00	0.95	0.00	0.00	4.34	8.79	0.00	0.11	2.43	0.20	7.05	7.95	0.26	33.87	0.49	6.62
0.00	10.41	1.73	0.00	0.00	0.00	0.00	8.03	0.06	0.01	1.05	2.38	0.00	20.38	53.33	0.00	0.61	2.02	0.00
0.00	28.27	0.54	0.00	0.00	0.18	0.00	4.63	0.05	0.03	1.92	5.06	0.99	23.06	32.31	0.13	0.07	2.70	0.06
0.00	29.54	1.05	0.00	0.00	0.00	0.00	3.76	0.19	0.00	8.12	3.87	0.08	7.59	44.74	0.03	0.23	0.80	0.00
0.00	12.34	2.26	0.00	0.20	0.72	0.00	0.85	0.33	0.01	0.00	2.43	0.04	4.90	72.34	0.00	0.63	2.83	0.12
0.79	86.92	0.43	0.00	0.14	0.00	0.00	0.60	0.34	0.00	2.19	1.27	0.38	4.34	0.00	0.05	0.56	0.77	1.21
0.01	48.81	2.14	0.00	0.00	0.12	0.00	5.28	0.44	0.08	1.06	6.17	0.91	22.37	8.98	0.00	0.54	2.86	0.22
0.00	32.37	10.73	0.00	0.81	5.69	0.00	0.00	5.18	0.00	0.00	2.27	2.61	4.45	29.30	0.18	1.98	1.31	3.13
0.00	17.64	8.32	0.13	0.85	0.00	0.00	0.00	4.83	0.02	0.00	1.56	0.39	40.82	7.91	0.12	3.07	5.30	9.02
0.00	43.61	2.24	0.00	0.00	0.00	0.00	1.95	0.19	0.09	0.59	3.76	0.00	5.98	40.51	0.00	0.71	0.36	0.00
0.00	31.10	1.97	0.00	0.00	0.96	0.00	2.06	2.65	0.00	0.07	3.16	3.88	14.96	33.37	0.00	1.50	4.27	0.03
0.00	39.55	0.83	0.00	0.00	0.07	0.00	4.60	0.03	0.00	0.04	6.56	0.07	10.27	37.26	0.00	0.03	0.69	0.00
0.00	32.64	5.41	0.00	0.00	6.04	0.00	0.04	0.15	0.00	0.04	3.74	5.54	12.52	0.02	0.00	0.91	8.96	23.98

0.00	35.84	2.04	0.00	0.00	0.00	0.00	3.54	0.35	0.00	2.06	5.77	0.00	3.48	45.97	0.00	0.81	0.14	0.00
0.00	14.64	2.72	0.00	1.14	1.12	0.00	4.78	0.18	0.01	0.00	2.86	0.96	11.83	51.02	0.00	1.59	6.92	0.24
0.00	19.30	8.59	0.00	0.20	0.14	0.00	0.01	1.01	0.03	0.05	4.52	0.00	5.43	58.90	0.01	0.94	0.32	0.55
0.00	41.13	1.61	0.00	0.33	0.00	0.00	0.28	0.17	0.00	1.33	0.66	0.00	10.94	0.07	0.45	1.25	2.09	39.67
0.00	35.54	2.00	0.00	0.02	0.00	0.00	5.99	0.13	0.00	0.96	1.53	0.00	5.39	48.31	0.12	0.00	0.00	0.00
0.00	12.66	2.89	0.00	0.36	0.00	0.00	4.18	0.00	0.02	0.74	3.92	0.17	20.90	50.94	0.00	0.62	2.59	0.00
0.00	27.82	3.22	0.00	0.00	6.99	0.00	0.00	3.79	0.02	0.00	1.41	3.45	3.17	0.00	0.23	1.80	2.35	45.76
0.00	39.23	3.36	0.00	0.00	4.03	0.00	0.10	1.27	0.02	0.00	1.97	2.46	21.63	6.30	0.00	3.60	8.75	7.29
0.00	32.24	3.22	0.30	0.02	0.00	0.00	0.00	1.43	0.00	0.01	2.28	0.00	12.44	33.24	0.76	1.11	3.27	9.69
0.00	43.35	2.02	0.00	0.00	0.00	0.00	2.82	0.13	0.01	0.87	3.34	0.00	14.59	31.14	0.00	0.70	0.97	0.05
0.00	8.13	33.67	0.00	1.89	0.00	0.00	0.00	0.00	0.00	0.00	3.53	9.52	10.93	3.26	0.10	2.84	5.23	20.91
0.00	56.12	1.67	0.00	0.00	0.03	0.00	3.24	0.14	0.01	1.73	2.77	0.00	1.88	31.60	0.06	0.46	0.01	0.29
0.14	89.09	1.01	0.00	0.00	0.00	0.00	1.24	0.26	0.01	0.73	1.91	0.00	1.53	0.54	0.00	0.93	0.00	2.63
0.00	24.64	2.66	0.03	0.00	13.13	0.02	0.06	1.47	0.00	0.00	3.54	0.00	6.23	4.72	0.00	0.96	1.11	41.45
0.00	47.20	19.32	0.09	0.00	0.00	0.00	0.00	0.43	0.07	0.00	3.37	4.06	6.91	5.79	0.00	8.02	0.26	4.49
0.59	82.55	1.11	0.00	0.21	0.00	0.00	0.34	0.00	0.02	0.46	0.56	0.00	3.84	0.00	0.11	0.00	0.02	10.20
0.00	7.38	7.31	0.00	2.52	0.07	0.00	0.86	0.48	0.00	1.78	2.39	49.51	19.46	0.00	0.00	1.04	6.52	0.66
0.00	88.13	0.26	0.00	0.00	0.00	0.00	3.48	0.12	0.00	1.74	0.55	0.00	4.62	0.29	0.00	0.27	0.50	0.02
0.00	34.52	2.79	0.00	0.02	0.21	0.00	1.79	1.91	0.00	0.00	3.00	0.08	11.60	36.73	0.00	0.22	6.90	0.23
0.00	16.15	0.68	0.00	0.00	0.00	0.00	3.57	0.04	0.00	1.51	3.61	0.00	23.03	49.78	0.01	0.17	1.47	0.00
0.00	28.77	3.53	0.00	0.00	0.00	0.00	2.55	1.52	0.05	0.00	2.97	0.00	24.47	25.55	0.00	4.13	2.66	3.81
0.00	37.73	5.71	0.01	0.04	0.00	0.00	0.72	1.59	0.00	0.00	1.72	0.00	12.51	36.70	0.31	1.94	0.10	0.91
0.00	12.03	5.25	0.00	8.24	0.00	0.00	0.00	0.06	0.00	1.44	7.94	0.00	9.38	0.00	0.00	0.20	0.74	54.71
0.00	7.32	3.34	0.00	0.76	0.28	0.00	1.82	0.20	0.00	0.20	1.22	0.28	7.71	73.21	0.08	0.19	3.31	0.08
0.00	9.78	1.46	0.00	0.00	0.00	0.00	1.57	0.16	0.01	0.45	3.38	0.00	9.03	73.61	0.00	0.43	0.11	0.00
0.13	34.62	4.06	0.01	0.66	1.08	0.00	2.17	0.99	0.02	1.46	3.60	1.65	12.64	25.22	0.08	1.58	2.51	7.52
4.28	0.16	0.13	1.00	0.00	0.00	0.00	0.00	0.00	28.06	38.20	0.26	0.01	13.07	4.43	0.00	0.00	0.10	10.30
0.00	0.22	0.03	3.55	0.00	0.00	0.00	0.00	0.00	43.81	33.02	0.00	0.01	9.91	3.17	2.79	1.03	2.08	0.39
1.25	0.97	0.06	14.08	0.00	0.24	0.00	0.00	0.03	22.48	25.56	0.08	0.16	13.88	6.04	0.28	0.01	0.14	14.73

0.00	0.81	0.01	4.67	0.00	0.00	0.00	0.00	0.00	51.14	28.45	0.00	0.11	8.32	0.34	4.88	0.98	0.29	0.00
59.38	0.11	0.05	13.27	0.00	0.00	0.00	0.00	0.00	3.67	8.48	0.00	0.03	9.15	0.75	3.55	1.39	0.17	0.00
0.00	0.97	0.00	7.01	0.00	0.00	0.00	0.00	0.00	47.25	23.87	0.09	0.59	14.96	0.15	0.43	4.18	0.21	0.29
21.79	1.27	0.00	10.18	0.00	0.00	0.00	0.00	0.00	33.08	5.26	0.00	0.16	22.98	0.00	2.12	3.16	0.00	0.00
32.47	0.00	0.48	0.00	0.02	0.00	0.00	0.00	0.00	30.29	16.37	0.00	0.00	16.32	1.50	2.28	0.27	0.00	0.00
0.00	0.07	0.66	0.60	0.00	0.37	0.00	0.00	0.00	43.58	31.05	0.00	0.15	14.76	0.48	2.64	4.84	0.81	0.00
31.22	0.03	1.58	0.31	0.00	0.00	0.00	0.00	0.00	3.64	33.94	0.28	0.01	8.96	4.57	14.86	0.00	0.60	0.00
0.00	0.53	0.11	7.06	0.00	0.00	0.00	0.00	0.00	45.59	29.95	0.00	0.00	7.78	2.01	6.91	0.03	0.03	0.00
0.59	0.80	0.01	8.20	0.00	0.00	0.00	0.00	0.00	41.77	23.30	0.04	0.05	13.71	2.50	7.09	0.69	1.25	0.00
5.88	0.13	0.70	0.36	0.00	0.00	0.00	0.00	0.00	30.50	32.94	0.02	0.03	17.67	0.99	10.59	0.18	0.00	0.00
26.05	0.62	0.06	17.06	0.00	0.00	0.00	0.00	0.00	18.05	10.06	0.00	0.11	18.60	0.00	1.37	7.52	0.50	0.00
0.30	0.73	0.00	11.87	0.00	0.00	0.00	0.00	0.00	45.50	24.39	0.00	0.03	10.23	1.95	3.25	1.21	0.55	0.00
2.37	0.10	0.07	1.25	0.00	0.00	0.00	0.00	0.00	36.55	29.84	0.05	0.03	14.49	3.78	0.00	0.01	0.00	11.45
0.76	0.66	0.08	3.85	0.00	0.00	0.00	0.00	0.00	53.52	25.46	0.11	0.11	12.75	0.00	0.62	2.09	0.00	0.00
49.12	0.11	1.15	1.69	0.00	0.00	0.00	0.00	0.00	0.17	8.46	2.85	0.69	18.81	2.86	0.00	0.00	0.00	14.08
69.40	0.00	1.83	0.06	0.00	0.00	0.00	0.00	0.00	1.67	0.89	3.21	0.28	19.51	0.24	0.00	2.42	0.48	0.00
17.92	0.32	0.24	0.45	0.00	0.00	0.00	0.00	0.00	37.73	9.84	0.29	0.02	19.87	3.64	0.01	0.01	0.07	9.61
0.08	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	52.67	18.79	0.18	0.00	10.67	4.65	0.00	0.01	0.24	12.26
0.00	0.21	0.00	0.82	0.00	0.00	0.00	0.00	0.00	50.82	33.00	0.04	0.00	9.28	2.60	3.21	0.01	0.00	0.01
74.71	0.00	0.73	0.47	0.00	0.00	0.00	0.00	0.00	0.06	1.62	0.01	0.00	20.04	0.75	0.49	1.12	0.00	0.00
21.02	0.52	0.00	6.20	0.00	0.00	0.00	0.00	0.00	34.07	14.00	0.00	0.00	14.90	2.48	6.60	0.22	0.00	0.00
1.11	0.12	0.73	0.00	0.00	0.00	0.00	0.00	0.00	53.79	23.58	0.32	0.00	16.55	1.08	0.01	2.07	0.64	0.00
0.00	0.45	0.06	0.89	0.00	0.00	0.00	0.00	0.00	51.64	23.95	0.00	0.07	10.08	1.46	10.99	0.19	0.21	0.00
46.74	0.10	0.49	0.69	0.00	0.00	0.00	0.00	0.00	20.61	4.87	0.20	0.15	22.32	0.99	1.95	0.80	0.07	0.00
3.61	0.16	1.09	0.04	0.00	0.00	0.00	0.00	0.00	28.23	23.80	0.09	0.01	19.49	2.84	0.00	0.00	0.09	20.56
0.13	0.56	0.00	8.15	0.00	0.00	0.00	0.00	0.00	23.84	34.69	0.13	0.09	8.81	4.26	0.00	0.00	0.15	19.19
0.35	0.34	0.02	3.18	0.01	0.00	0.00	0.00	0.00	47.21	34.59	0.06	0.00	9.32	2.07	2.01	0.50	0.35	0.00
59.19	0.57	0.13	12.24	0.00	0.00	0.00	0.00	0.00	5.98	4.74	0.36	0.07	15.02	0.00	0.17	1.53	0.00	0.00
0.00	0.12	0.00	0.65	0.00	0.00	0.00	0.00	0.00	44.48	32.68	0.00	0.32	9.22	1.49	9.72	0.84	0.47	0.00

0.00	0.17	0.18	0.00	0.00	0.00	0.00	0.00	0.02	52.36	18.34	0.00	0.05	8.66	3.05	17.06	0.00	0.09	0.01
24.36	0.17	0.98	0.70	0.00	0.00	0.00	0.00	0.00	14.05	32.13	0.53	0.01	16.77	6.53	2.19	0.03	0.91	0.65
0.55	0.02	0.00	5.50	0.00	1.28	0.00	0.00	0.00	1.83	28.16	0.00	0.01	11.13	5.81	0.00	0.00	0.44	45.27
17.10	1.11	0.18	14.06	0.00	0.00	0.00	0.00	0.00	26.97	19.50	0.65	0.30	15.91	0.06	2.80	1.30	0.04	0.00
54.82	0.04	1.77	0.25	0.00	0.00	0.00	0.00	0.00	14.48	7.28	1.66	0.90	16.93	0.05	0.00	1.25	0.07	0.50
0.08	0.82	0.00	9.00	0.00	0.00	0.00	0.00	0.00	34.88	34.41	0.31	0.30	8.29	1.86	0.00	0.00	0.05	9.98
0.00	0.09	2.01	0.19	0.00	0.53	0.00	0.00	0.00	47.72	21.41	0.00	0.06	16.65	3.34	6.96	0.48	0.56	0.00
0.00	0.18	0.02	0.09	0.02	0.00	0.00	0.00	0.00	70.38	19.89	0.00	0.00	6.88	0.36	2.03	0.15	0.00	0.00
11.56	0.00	0.39	0.75	0.00	0.16	0.00	0.00	0.00	32.61	25.71	0.04	0.01	17.90	1.89	0.48	6.25	2.25	0.00
0.00	0.66	0.10	0.57	0.00	0.00	0.00	0.00	0.00	56.04	19.82	0.14	0.04	13.45	2.16	7.00	0.00	0.03	0.00
67.09	0.00	0.45	0.03	0.01	0.00	0.00	0.00	0.00	5.16	0.75	0.17	0.00	24.52	0.31	0.03	1.48	0.00	0.00
61.88	0.01	0.15	0.43	0.01	0.00	0.00	0.00	0.00	6.02	0.09	2.47	0.00	27.43	0.47	0.00	1.01	0.02	0.00
35.53	0.03	2.44	0.27	0.00	0.05	0.00	0.00	0.00	11.53	19.23	5.30	1.84	18.70	1.62	0.63	1.04	1.80	0.00
56.69	0.05	0.44	0.44	0.00	0.00	0.00	0.00	0.00	8.84	4.17	10.57	1.54	15.73	1.07	0.43	0.03	0.00	0.00
0.03	0.62	0.23	1.65	0.00	0.00	0.00	0.00	0.00	49.98	23.04	0.00	0.16	13.36	0.77	6.30	2.43	1.45	0.00
51.81	0.00	1.36	0.00	0.00	0.00	0.00	0.00	0.00	8.43	0.93	15.57	1.81	16.91	2.66	0.49	0.01	0.03	0.00
41.42	0.22	0.57	1.83	0.00	0.00	0.00	0.00	0.00	1.20	15.09	0.00	0.38	19.98	5.14	0.00	0.00	0.11	14.07
32.62	1.03	0.04	13.08	0.00	0.00	0.00	0.00	0.00	27.22	4.82	0.00	0.01	15.08	0.23	2.63	2.38	0.88	0.00
23.06	0.06	0.67	0.00	0.00	0.00	0.00	0.00	0.00	39.42	9.35	0.00	0.00	18.43	1.56	6.96	0.30	0.19	0.00
12.74	1.18	0.02	9.36	0.01	0.00	0.00	0.00	0.00	41.20	12.91	0.00	0.02	17.18	0.37	1.96	2.97	0.10	0.00
33.71	0.97	0.00	20.40	0.00	0.00	0.00	0.00	0.00	9.06	11.72	0.00	0.00	11.12	3.11	9.85	0.02	0.05	0.00
1.74	0.45	0.00	9.90	0.00	0.00	0.00	0.00	0.00	18.49	41.47	0.13	0.00	12.95	3.67	0.00	0.00	0.74	10.46
39.72	0.04	0.33	1.74	0.01	0.00	0.00	0.00	0.00	21.61	9.77	0.00	0.06	20.08	0.31	1.99	4.00	0.34	0.00
33.06	0.09	1.27	0.04	0.00	0.00	0.00	0.00	0.00	20.30	11.99	0.19	0.04	20.33	3.16	9.37	0.10	0.05	0.00
0.00	0.25	0.31	0.01	0.00	0.00	0.00	0.00	0.00	54.02	27.07	0.81	0.06	12.18	1.83	2.93	0.18	0.35	0.00
54.26	0.07	1.54	0.12	0.00	0.00	0.00	0.00	0.00	8.58	0.49	0.72	0.12	24.92	0.00	0.00	8.31	0.86	0.00
1.38	0.11	0.37	0.14	0.00	0.00	0.00	0.00	0.00	51.80	20.77	0.01	0.00	15.08	1.52	0.97	4.73	3.13	0.00
64.46	0.12	0.02	3.81	0.01	0.00	0.00	0.00	0.00	5.81	0.55	0.64	0.03	22.85	0.14	0.00	1.55	0.00	0.00
1.87	0.66	0.00	8.52	0.00	0.00	0.00	0.00	0.00	50.52	19.70	0.00	0.00	8.87	2.21	7.54	0.10	0.00	0.00

54.99	0.23	0.05	5.81	0.00	0.00	0.00	0.00	0.00	3.62	9.75	0.02	0.01	20.07	1.36	3.70	0.38	0.01	0.00
39.08	0.00	3.99	0.24	0.00	0.00	0.00	0.00	0.00	6.64	22.22	3.22	1.07	14.10	3.13	2.42	1.29	2.58	0.01
0.00	0.16	0.20	0.06	0.00	0.00	0.00	0.00	0.00	57.15	23.79	0.00	0.23	11.53	0.43	0.76	4.77	0.93	0.00
64.40	0.15	1.36	0.40	0.00	0.00	0.00	0.00	0.00	4.70	0.99	0.00	0.14	21.18	0.91	4.14	1.31	0.33	0.00
0.00	0.23	0.05	1.21	0.00	0.00	0.00	0.00	0.00	54.06	30.28	1.08	0.26	10.09	0.00	0.00	2.72	0.03	0.00
0.00	0.00	1.17	2.29	0.00	2.23	0.00	0.00	0.00	33.76	32.91	0.10	0.07	10.59	1.08	0.30	10.92	4.60	0.00
11.63	0.52	1.05	3.76	0.00	0.00	0.00	0.00	0.00	12.86	31.95	0.03	0.12	23.51	5.76	0.58	0.03	0.93	7.26
0.00	0.82	0.03	3.42	0.00	0.32	0.00	0.00	0.00	18.53	30.39	0.00	0.05	12.76	2.73	0.00	0.02	0.01	30.92
2.00	0.00	1.61	0.01	0.00	0.00	0.00	0.00	0.00	21.82	34.08	0.28	0.01	4.14	7.92	23.60	0.00	4.51	0.00
49.35	0.07	0.00	1.82	0.00	0.00	0.00	0.00	0.00	10.64	12.13	0.00	0.00	21.33	1.31	2.40	0.96	0.00	0.00
0.81	0.03	0.75	0.24	0.00	0.05	0.00	0.00	0.01	22.38	21.56	0.02	0.08	19.93	8.09	0.12	0.00	0.57	25.36
6.13	0.17	0.20	1.36	0.00	0.00	0.00	0.00	0.00	37.57	23.54	0.37	0.02	26.69	0.88	0.00	0.85	0.00	2.23
0.04	0.06	0.23	0.12	0.01	0.00	0.00	0.00	0.00	60.66	21.05	0.10	0.03	11.39	1.67	0.00	0.41	0.26	4.00
1.55	0.11	2.50	2.97	0.00	0.38	0.00	0.00	0.00	16.28	31.53	0.45	0.01	12.16	7.71	23.04	0.14	0.98	0.18
39.55	0.45	0.02	3.07	0.00	0.00	0.00	0.00	0.00	17.73	9.39	8.19	1.55	18.29	0.01	0.00	1.75	0.00	0.00
37.79	0.49	0.02	15.89	0.00	0.00	0.00	0.00	0.00	11.87	16.43	3.96	0.60	11.96	0.18	0.00	0.76	0.06	0.00
74.86	0.01	0.09	2.96	0.00	0.00	0.00	0.00	0.00	0.00	0.97	1.84	0.00	18.34	0.36	0.00	0.58	0.00	0.00
0.70	0.53	0.00	9.96	0.00	0.00	0.00	0.00	0.00	41.87	25.87	0.00	0.09	14.68	0.50	1.53	3.96	0.30	0.00
0.00	0.00	1.02	0.05	0.00	0.00	0.00	0.00	0.00	35.96	29.42	2.19	0.74	11.79	6.34	0.15	0.00	1.55	10.80
31.38	0.00	0.49	2.32	0.00	0.00	0.00	0.00	0.06	0.16	33.76	10.79	3.53	8.91	2.46	0.00	0.04	0.66	5.44
19.46	0.86	0.00	17.13	0.00	0.00	0.00	0.00	0.00	18.57	8.72	0.15	0.04	20.51	3.54	8.95	0.73	1.33	0.00
1.63	0.27	0.03	4.71	0.00	0.02	0.00	0.00	0.00	18.20	39.76	0.21	0.03	14.67	8.35	9.91	0.00	1.75	0.46
0.83	0.33	0.13	0.21	0.00	0.00	0.00	0.00	0.00	54.03	23.40	0.00	0.00	12.94	1.97	5.98	0.09	0.10	0.00
0.00	0.04	0.05	14.54	0.00	4.74	0.00	0.00	0.00	2.17	29.10	0.05	0.00	8.92	6.98	31.81	0.00	1.59	0.00
49.02	0.08	0.67	0.54	0.00	0.00	0.00	0.00	0.00	18.93	3.40	0.00	0.03	21.70	0.29	4.06	1.28	0.00	0.00
7.89	0.58	0.38	1.99	0.00	0.00	0.00	0.00	0.00	33.54	16.54	0.13	0.01	13.94	5.40	18.48	0.00	1.13	0.00
0.00	0.00	2.89	0.00	0.00	0.71	0.00	0.00	0.00	40.70	27.03	0.00	0.01	12.10	1.76	10.66	2.39	1.75	0.00
53.34	0.24	0.00	13.66	0.01	0.00	0.00	0.00	0.00	2.75	10.00	0.00	0.00	10.63	2.60	6.75	0.02	0.00	0.00
0.12	0.30	0.00	33.48	0.00	3.30	0.00	0.00	0.00	2.09	45.21	0.54	0.02	6.53	5.49	1.10	0.00	0.65	1.17

33.43	0.02	2.11	0.01	0.00	0.00	0.00	0.00	0.00	14.09	11.19	0.58	0.28	18.46	5.31	0.08	0.00	0.96	13.49
20.28	0.45	0.36	1.84	0.00	0.00	0.00	0.00	0.00	11.10	28.27	0.15	0.03	21.17	4.24	11.66	0.00	0.17	0.28
12.67	0.51	0.16	1.32	0.00	0.00	0.00	0.00	0.00	38.17	23.23	0.00	0.03	19.33	0.50	2.02	1.93	0.13	0.00
24.05	1.29	0.00	11.56	0.00	0.00	0.00	0.00	0.00	32.40	10.27	0.00	0.07	13.03	0.08	6.26	0.98	0.00	0.00
11.79	0.32	0.00	8.21	0.00	0.00	0.00	0.00	0.00	31.04	27.55	0.00	0.03	13.21	0.36	1.97	3.84	1.68	0.00
1.76	0.77	0.00	2.25	0.00	0.00	0.00	0.00	0.00	50.33	23.60	0.00	0.06	17.88	0.08	0.70	2.57	0.00	0.00
61.40	0.08	3.01	0.16	0.00	0.00	0.00	0.00	0.00	11.38	4.42	1.67	0.22	17.20	0.00	0.00	0.45	0.00	0.00
0.42	0.69	0.13	30.94	0.00	4.06	0.00	0.00	0.00	10.36	21.92	0.46	0.11	16.42	3.77	0.00	0.02	0.00	10.70
18.41	0.02	0.67	0.28	0.00	0.00	0.00	0.00	0.00	2.08	22.06	0.03	0.03	14.28	4.98	0.00	0.00	0.00	37.15
0.19	0.28	0.00	2.88	0.00	0.00	0.00	0.00	0.00	54.78	23.72	0.00	0.20	11.40	0.88	1.92	2.80	0.93	0.00
19.82	0.32	0.52	4.46	0.00	0.18	0.00	0.00	0.00	27.37	19.92	0.85	0.21	15.07	2.29	3.74	1.25	0.55	3.43

Appendix 4A: Maxent Results From 120,000 Years Ago

Species	#Training samples	Regularized training gain	Unregularized training gain	Iterations	Training AUC	#Test samples	Test gain	Test AUC	AUC Standard Deviation
austrina_0	76	4.11	4.33	500	0.995	25	4.47	1.00	0.001
austrina_1	76	4.16	4.33	500	0.994	25	3.94	0.99	0.009
austrina_2	76	4.11	4.28	500	0.993	25	4.42	1.00	0.001
austrina_3	76	4.27	4.41	500	0.995	25	3.95	0.97	0.023
austrina_4	76	4.11	4.34	500	0.995	25	4.15	0.99	0.001
austrina_5	76	4.16	4.33	500	0.994	25	3.93	0.98	0.016
austrina_6	76	4.09	4.27	500	0.994	25	4.29	0.99	0.001
austrina_7	76	4.02	4.23	500	0.994	25	4.35	1.00	0.001
austrina_8	76	4.25	4.41	500	0.995	25	4.49	1.00	0.001
austrina_9	76	4.01	4.24	500	0.995	25	4.49	1.00	0.001
austrina_10	76	3.92	4.17	500	0.994	25	4.27	1.00	0.001
austrina_11	76	4.29	4.42	500	0.995	25	3.38	0.95	0.028
austrina_12	76	3.96	4.21	500	0.994	25	4.05	0.99	0.005
austrina_13	76	3.94	4.21	500	0.994	25	3.99	0.99	0.001
austrina_14	76	4.06	4.29	500	0.995	25	4.09	0.99	0.001
austrina_15	76	3.98	4.17	500	0.994	25	4.35	0.99	0.001

austrina_16	76	4.25	4.38	500	0.995	25	3.54	0.98	0.014
austrina_17	76	4.14	4.31	500	0.995	25	4.29	1.00	0.001
austrina_18	76	4.26	4.40	500	0.995	25	3.62	0.97	0.023
austrina_19	76	3.99	4.21	500	0.994	25	4.23	0.99	0.003
austrina_20	76	3.97	4.18	500	0.994	25	4.14	0.99	0.002
austrina_21	76	3.92	4.15	500	0.994	25	3.97	0.99	0.003
austrina_22	76	4.09	4.28	500	0.994	25	4.49	1.00	0.001
austrina_23	76	3.98	4.23	500	0.994	25	3.95	0.99	0.002
austrina_24	76	4.27	4.42	500	0.995	25	4.30	0.99	0.001
austrina_25	76	3.98	4.25	500	0.995	25	4.26	1.00	0.001
austrina_26	76	4.07	4.28	500	0.995	25	4.02	0.99	0.006
austrina_27	76	4.09	4.34	500	0.995	25	4.09	0.99	0.001
austrina_28	76	4.10	4.29	500	0.995	25	4.52	1.00	0.001
austrina_29	76	3.99	4.22	500	0.994	25	4.29	0.99	0.001
austrina_30	76	4.22	4.37	500	0.995	25	3.85	0.97	0.019
austrina_31	76	4.13	4.30	500	0.994	25	4.05	0.99	0.008
austrina_32	76	3.97	4.21	500	0.995	25	4.03	0.99	0.001
austrina_33	76	4.00	4.19	500	0.993	25	4.06	0.99	0.002
austrina_34	76	4.03	4.26	500	0.994	25	4.33	0.99	0.001
austrina_35	76	4.10	4.29	500	0.995	25	3.91	0.99	0.009
austrina_36	76	3.96	4.24	500	0.994	25	4.22	0.99	0.001
austrina_37	76	4.05	4.22	500	0.994	25	4.07	0.98	0.012
austrina_38	76	3.96	4.19	500	0.995	25	4.07	0.99	0.001
austrina_39	76	4.14	4.31	500	0.994	25	3.84	0.99	0.006
austrina_40	76	4.21	4.37	500	0.994	25	3.97	0.99	0.005
austrina_41	76	4.14	4.31	500	0.994	25	4.40	1.00	0.001
austrina_42	76	3.82	4.09	500	0.994	25	4.26	0.99	0.001
austrina_43	76	4.16	4.34	500	0.995	25	4.25	0.99	0.001
austrina_44	76	4.09	4.29	500	0.994	25	4.51	1.00	0.001

austrina_45	76	4.15	4.32	500	0.995	25	4.43	1.00	0.001
austrina_46	76	3.97	4.19	500	0.994	25	4.33	0.99	0.001
austrina_47	76	4.21	4.36	500	0.995	25	3.94	0.98	0.012
austrina_48	76	3.90	4.20	500	0.994	25	4.04	0.99	0.001
austrina_49	76	4.14	4.33	500	0.995	25	4.08	0.99	0.001
austrina_50	76	3.88	4.12	500	0.994	25	4.12	0.99	0.002
austrina_51	76	4.12	4.35	500	0.995	25	4.03	0.99	0.001
austrina_52	76	4.09	4.32	500	0.995	25	3.94	0.98	0.010
austrina_53	76	4.14	4.30	500	0.994	25	3.98	0.99	0.001
austrina_54	76	4.07	4.26	500	0.994	25	4.42	1.00	0.001
austrina_55	76	4.16	4.34	500	0.995	25	3.69	0.98	0.010
austrina_56	76	4.14	4.30	500	0.994	25	4.06	0.99	0.002
austrina_57	76	4.00	4.27	500	0.994	25	4.39	1.00	0.001
austrina_58	76	4.05	4.25	500	0.994	25	4.17	0.99	0.001
austrina_59	76	4.02	4.24	500	0.994	25	4.49	1.00	0.001
austrina_60	76	3.92	4.20	500	0.994	25	4.18	0.99	0.002
austrina_61	76	3.94	4.18	500	0.994	25	4.26	1.00	0.001
austrina_62	76	4.15	4.31	500	0.993	25	4.09	0.99	0.007
austrina_63	76	4.12	4.32	500	0.995	25	4.40	1.00	0.001
austrina_64	76	3.99	4.24	500	0.995	25	4.17	0.99	0.001
austrina_65	76	3.99	4.25	500	0.995	25	4.45	1.00	0.001
austrina_66	76	4.02	4.23	500	0.995	25	4.39	0.99	0.001
austrina_67	76	4.15	4.33	500	0.995	25	4.12	0.99	0.002
austrina_68	76	4.12	4.30	500	0.995	25	4.25	0.99	0.001
austrina_69	76	4.14	4.32	500	0.993	25	4.05	0.99	0.002
austrina_70	76	4.14	4.32	500	0.995	25	4.34	0.99	0.001
austrina_71	76	4.18	4.34	500	0.994	25	4.42	1.00	0.001
austrina_72	76	4.05	4.26	500	0.994	25	4.06	0.99	0.001
austrina_73	76	4.11	4.30	500	0.995	25	4.32	1.00	0.001

austrina_74	76	3.97	4.21	500	0.995	25	4.17	0.99	0.001
austrina_75	76	4.19	4.33	500	0.995	25	4.15	0.99	0.001
austrina_76	76	3.85	4.11	500	0.994	25	4.30	0.99	0.001
austrina_77	76	4.24	4.41	500	0.995	25	4.21	0.99	0.001
austrina_78	76	4.10	4.31	500	0.995	25	3.81	0.98	0.011
austrina_79	76	4.14	4.30	500	0.995	25	4.14	0.99	0.003
austrina_80	76	4.14	4.37	500	0.995	25	4.37	0.99	0.001
austrina_81	76	4.10	4.29	500	0.995	25	4.46	1.00	0.001
austrina_82	76	4.05	4.26	500	0.995	25	4.39	1.00	0.001
austrina_83	76	4.10	4.29	500	0.995	25	3.96	0.99	0.003
austrina_84	76	3.93	4.18	500	0.994	25	4.25	0.99	0.001
austrina_85	76	4.20	4.37	500	0.994	25	4.04	0.99	0.006
austrina_86	76	4.10	4.30	500	0.995	25	4.13	0.99	0.001
austrina_87	76	4.11	4.31	500	0.994	25	3.93	0.99	0.001
austrina_88	76	4.10	4.30	500	0.995	25	3.68	0.96	0.023
austrina_89	76	4.17	4.35	500	0.995	25	4.01	0.98	0.011
austrina_90	76	4.06	4.23	500	0.995	25	4.36	0.99	0.001
austrina_91	76	4.19	4.34	500	0.995	25	3.48	0.96	0.021
austrina_92	76	4.10	4.34	500	0.995	25	4.47	1.00	0.001
austrina_93	76	4.12	4.27	500	0.995	25	4.33	0.99	0.001
austrina_94	76	4.11	4.35	500	0.995	25	4.19	0.99	0.001
austrina_95	76	3.93	4.15	500	0.993	25	4.35	1.00	0.001
austrina_96	76	3.98	4.21	500	0.994	25	4.27	1.00	0.001
austrina_97	76	4.02	4.23	500	0.994	25	4.17	0.99	0.003
austrina_98	76	4.18	4.36	500	0.995	25	4.22	0.99	0.004
austrina_99	76	4.10	4.31	500	0.995	25	4.31	0.99	0.001
austrina (average)	76	4.08	4.28	500	0.995	25	4.16	0.99	0.004
balfouriana_0	37	4.72	4.93	500	0.997	12	4.91	1.00	0.003

balfouriana_1	37	4.51	4.74	500	0.997	12	4.93	1.00	0.001
balfouriana_2	37	4.48	4.72	500	0.996	12	4.68	1.00	0.002
balfouriana_3	37	4.72	4.96	500	0.997	12	4.15	0.99	0.003
balfouriana_4	37	4.45	4.71	500	0.996	12	4.93	1.00	0.001
balfouriana_5	37	4.56	4.81	500	0.997	12	5.22	1.00	0.000
balfouriana_6	37	4.65	4.91	500	0.998	12	4.52	0.99	0.003
balfouriana_7	37	4.81	5.03	500	0.998	12	4.29	0.99	0.004
balfouriana_8	37	4.49	4.74	500	0.996	12	5.24	1.00	0.000
balfouriana_9	37	4.73	4.97	500	0.998	12	5.04	1.00	0.001
balfouriana_10	37	4.64	4.86	500	0.997	12	4.82	1.00	0.001
balfouriana_11	37	4.82	5.06	500	0.998	12	4.71	1.00	0.001
balfouriana_12	37	4.49	4.75	500	0.997	12	5.08	1.00	0.001
balfouriana_13	37	4.71	4.96	500	0.998	12	5.30	1.00	0.000
balfouriana_14	37	4.59	4.82	500	0.997	12	4.51	1.00	0.003
balfouriana_15	37	4.59	4.80	500	0.997	12	4.78	1.00	0.001
balfouriana_16	37	4.78	5.00	500	0.997	12	4.82	1.00	0.001
balfouriana_17	37	4.83	5.07	500	0.998	12	5.27	1.00	0.000
balfouriana_18	37	4.83	5.05	500	0.998	12	5.07	1.00	0.001
balfouriana_19	37	4.49	4.72	500	0.996	12	4.32	0.99	0.002

balfouriana_20	37	4.51	4.75	500	0.997	12	5.37	1.00	0.000
balfouriana_21	37	4.62	4.83	500	0.996	12	4.78	0.99	0.004
balfouriana_22	37	4.81	5.02	500	0.998	12	4.57	1.00	0.001
balfouriana_23	37	4.90	5.10	500	0.998	12	5.22	1.00	0.001
balfouriana_24	37	4.38	4.65	500	0.996	12	4.64	1.00	0.002
balfouriana_25	37	4.69	4.91	500	0.997	12	5.28	1.00	0.000
balfouriana_26	37	4.67	4.89	500	0.997	12	4.83	1.00	0.001
balfouriana_27	37	4.92	5.14	500	0.998	12	5.60	1.00	0.000
balfouriana_28	37	4.58	4.81	500	0.997	12	4.22	0.99	0.003
balfouriana_29	37	4.82	5.05	500	0.998	12	5.30	1.00	0.001
balfouriana_30	37	4.66	4.91	500	0.998	12	5.01	1.00	0.001
balfouriana_31	37	4.78	5.03	500	0.998	12	5.27	1.00	0.001
balfouriana_32	37	4.62	4.85	500	0.997	12	5.09	1.00	0.001
balfouriana_33	37	4.76	4.97	500	0.997	12	4.41	1.00	0.001
balfouriana_3	37	4.69	4.97	500	0.998	12	5.27	1.00	0.001

4									
balfouriana_35	37	4.72	4.94	500	0.998	12	5.09	1.00	0.001
balfouriana_36	37	4.71	4.93	500	0.997	12	5.18	1.00	0.000
balfouriana_37	37	4.90	5.12	500	0.998	12	4.55	1.00	0.001
balfouriana_38	37	4.70	4.93	500	0.997	12	4.91	1.00	0.001
balfouriana_39	37	4.61	4.88	500	0.997	12	4.99	1.00	0.001
balfouriana_40	37	4.72	4.97	500	0.998	12	5.13	1.00	0.001
balfouriana_41	37	4.51	4.79	500	0.997	12	5.05	1.00	0.001
balfouriana_42	37	4.71	4.92	500	0.997	12	5.07	1.00	0.001
balfouriana_43	37	4.79	5.00	500	0.997	12	4.18	0.99	0.003
balfouriana_44	37	4.82	5.05	500	0.998	12	5.41	1.00	0.000
balfouriana_45	37	4.60	4.85	500	0.997	12	4.91	1.00	0.001
balfouriana_46	37	4.63	4.86	500	0.997	12	4.83	1.00	0.001
balfouriana_47	37	4.76	4.99	500	0.998	12	4.76	1.00	0.001
balfouriana_48	37	4.67	4.91	500	0.997	12	4.56	1.00	0.002

balfouriana_49	37	4.99	5.21	500	0.998	12	4.64	1.00	0.001
balfouriana_50	37	4.71	4.94	500	0.997	12	5.15	1.00	0.001
balfouriana_51	37	4.80	5.03	500	0.998	12	5.31	1.00	0.001
balfouriana_52	37	4.57	4.82	500	0.997	12	4.80	1.00	0.001
balfouriana_53	37	4.87	5.09	500	0.998	12	4.47	0.99	0.004
balfouriana_54	37	4.87	5.08	500	0.998	12	5.33	1.00	0.001
balfouriana_55	37	4.64	4.87	500	0.997	12	5.12	1.00	0.001
balfouriana_56	37	4.44	4.71	500	0.996	12	4.79	1.00	0.002
balfouriana_57	37	4.39	4.66	500	0.996	12	4.57	1.00	0.001
balfouriana_58	37	4.62	4.86	500	0.997	12	4.93	1.00	0.001
balfouriana_59	37	4.75	4.95	500	0.997	12	5.04	1.00	0.001
balfouriana_60	37	4.67	4.89	500	0.997	12	4.83	1.00	0.001
balfouriana_61	37	4.39	4.65	500	0.996	12	4.70	1.00	0.001
balfouriana_62	37	4.76	5.00	500	0.998	12	5.07	1.00	0.001
balfouriana_6	37	4.60	4.86	500	0.997	12	5.10	1.00	0.001

3									
balfouriana_64	37	4.59	4.82	500	0.997	12	4.31	0.99	0.003
balfouriana_65	37	4.46	4.70	500	0.996	12	5.04	1.00	0.001
balfouriana_66	37	4.87	5.09	500	0.998	12	4.45	1.00	0.001
balfouriana_67	37	4.59	4.86	500	0.997	12	4.10	1.00	0.001
balfouriana_68	37	4.54	4.76	500	0.997	12	5.04	1.00	0.001
balfouriana_69	37	4.53	4.77	500	0.997	12	5.25	1.00	0.000
balfouriana_70	37	4.64	4.86	500	0.997	12	5.09	1.00	0.001
balfouriana_71	37	4.75	4.98	500	0.998	12	5.00	1.00	0.001
balfouriana_72	37	4.68	4.93	500	0.998	12	4.70	1.00	0.001
balfouriana_73	37	4.59	4.82	500	0.997	12	4.41	0.99	0.003
balfouriana_74	37	4.34	4.60	500	0.996	12	4.51	1.00	0.002
balfouriana_75	37	4.76	5.00	500	0.998	12	4.79	1.00	0.001
balfouriana_76	37	4.41	4.69	500	0.996	12	4.79	1.00	0.001
balfouriana_77	37	4.53	4.80	500	0.997	12	4.83	1.00	0.001

balfouriana_78	37	4.46	4.72	500	0.996	12	5.11	1.00	0.001
balfouriana_79	37	4.76	5.00	500	0.998	12	4.92	1.00	0.001
balfouriana_80	37	4.53	4.80	500	0.996	12	4.49	1.00	0.001
balfouriana_81	37	4.44	4.68	500	0.996	12	4.24	0.99	0.002
balfouriana_82	37	4.72	4.94	500	0.997	12	4.78	1.00	0.001
balfouriana_83	37	4.58	4.85	500	0.997	12	5.13	1.00	0.001
balfouriana_84	37	4.96	5.16	500	0.998	12	4.43	1.00	0.001
balfouriana_85	37	4.81	5.05	500	0.998	12	5.44	1.00	0.001
balfouriana_86	37	4.57	4.82	500	0.997	12	4.51	1.00	0.001
balfouriana_87	37	4.57	4.82	500	0.997	12	4.53	1.00	0.002
balfouriana_88	37	4.78	5.01	500	0.998	12	5.09	1.00	0.001
balfouriana_89	37	4.75	5.01	500	0.998	12	5.37	1.00	0.001
balfouriana_90	37	4.61	4.87	500	0.997	12	4.61	1.00	0.001
balfouriana_91	37	4.56	4.79	500	0.997	12	4.31	0.99	0.002
balfouriana_9	37	4.47	4.71	500	0.996	12	4.98	1.00	0.001

2									
balfouriana_93	37	4.85	5.09	500	0.998	12	4.14	0.99	0.004
balfouriana_94	37	4.63	4.86	500	0.997	12	4.41	0.99	0.003
balfouriana_95	37	4.35	4.62	500	0.996	12	5.11	1.00	0.000
balfouriana_96	37	4.86	5.08	500	0.998	12	4.53	1.00	0.001
balfouriana_97	37	4.68	4.90	500	0.997	12	4.75	1.00	0.001
balfouriana_98	37	4.42	4.74	500	0.997	12	4.68	1.00	0.001
balfouriana_99	37	4.47	4.72	500	0.997	12	4.82	1.00	0.001
balfouriana (average)	37	4.65	4.89	500	0.997	12	4.85	1.00	0.001

Appendix 4B: Maxent Percent Contribution for 120,000 Years Ago

#Background points	Bio1	Bio2	Bio3	Bio4	Bio5	Bio6	Bio7	Bio8	Bio9	Bio10	Bio11	Bio12	Bio13	Bio14	Bio15	Bio16	Bio17	Bio18	Bio19
10076	2.73	13.91	1.86	0.00	44.72	7.15	0.00	0.32	0.04	0.46	0.04	2.68	0.01	1.92	13.45	2.33	2.60	0.56	5.23
10074	0.00	17.92	2.63	0.00	40.92	5.04	0.00	0.00	0.04	2.59	0.00	0.36	0.00	2.60	5.36	2.57	5.05	0.08	14.84
10074	0.64	16.56	2.85	0.00	42.46	4.94	0.00	0.06	0.00	1.49	0.00	0.67	0.00	2.48	6.50	1.71	4.45	1.03	14.16
10076	0.11	19.58	0.44	0.00	43.46	7.04	0.00	0.03	0.02	0.98	0.00	0.66	0.00	2.97	3.73	0.29	6.43	0.09	14.15
10074	0.00	17.19	2.21	0.07	40.82	9.73	0.00	0.73	0.14	1.00	0.04	1.27	0.40	1.95	12.19	1.09	4.50	0.70	5.96
10072	0.00	13.58	2.48	0.00	44.83	5.44	0.00	0.00	0.09	0.84	0.00	1.93	0.48	2.51	5.66	1.29	3.50	1.18	16.16
10073	0.00	14.40	2.59	0.00	40.57	7.37	0.00	0.02	0.37	1.60	0.00	2.58	0.03	2.44	8.62	1.90	3.13	0.25	14.12
10074	0.00	14.94	3.78	0.04	36.89	6.59	0.22	0.01	0.13	0.39	1.04	1.33	0.00	1.92	9.45	4.03	4.52	0.36	14.37
10075	2.47	17.24	1.19	0.00	41.57	6.40	0.00	0.07	0.05	0.60	0.02	1.76	0.00	3.02	6.28	0.85	4.48	0.37	13.62
10072	0.00	12.61	4.51	0.00	38.44	5.23	0.00	0.20	0.11	0.73	0.00	4.34	0.36	2.42	7.64	2.51	2.66	0.65	17.58
10074	0.00	13.12	4.52	0.00	42.11	5.20	0.00	0.02	0.16	0.48	0.00	1.17	0.00	2.27	9.91	3.18	4.27	0.19	13.39
10073	4.55	17.59	0.57	0.00	41.29	4.03	0.00	2.19	0.06	0.75	0.92	1.39	0.01	2.37	5.36	1.87	3.96	0.06	13.04
10074	0.00	10.77	5.09	0.00	41.03	6.25	0.00	0.28	0.09	1.12	0.02	1.99	0.00	2.15	13.93	3.21	3.26	0.30	10.52
10071	0.00	6.45	5.90	0.00	45.28	2.62	0.22	0.00	0.26	1.12	0.00	0.25	0.41	1.99	6.40	3.63	4.20	0.20	21.07
10075	0.63	10.58	3.08	0.00	51.30	2.27	0.00	1.67	0.13	1.94	0.00	1.74	0.00	1.56	6.84	2.37	2.10	0.13	13.65
10074	0.68	14.27	5.59	0.01	40.93	2.90	0.00	0.01	0.08	1.49	0.00	1.70	0.00	2.45	7.86	2.55	4.71	0.56	14.23
10075	1.07	20.39	0.61	0.00	42.39	8.07	0.37	0.27	0.02	0.16	0.09	1.28	0.01	2.68	3.90	0.26	5.48	0.00	12.96

10071	0.00	17.53	2.32	0.00	37.49	8.40	0.00	0.01	0.03	0.73	0.00	2.12	0.17	1.66	6.16	2.21	4.35	1.34	15.48
10075	4.09	17.23	1.07	0.00	40.75	4.23	0.00	2.30	0.08	0.70	0.04	0.92	0.00	3.39	5.14	1.94	4.07	0.25	13.81
10075	0.71	13.39	3.59	0.00	45.03	5.26	0.00	0.03	0.07	0.00	0.81	2.01	0.00	1.71	8.54	2.72	2.83	0.21	13.09
10073	0.00	14.49	3.42	0.00	39.80	5.55	0.00	0.03	0.15	1.85	0.00	1.93	0.02	2.63	9.34	3.58	2.82	0.53	13.87
10075	0.00	12.33	4.98	0.00	37.90	5.75	0.10	0.36	0.01	1.03	0.00	1.48	0.01	2.04	10.97	1.26	5.58	0.40	15.79
10073	0.00	14.02	1.37	0.00	43.29	6.93	0.00	0.04	0.07	2.39	0.03	2.41	0.01	2.06	8.26	2.45	2.93	0.39	13.35
10072	0.00	13.26	3.74	0.00	43.22	5.39	0.00	0.02	0.20	0.83	0.00	0.95	0.00	2.53	9.53	4.06	2.37	0.18	13.73
10075	4.28	17.12	1.18	0.00	40.17	4.06	0.00	2.25	0.05	0.39	0.06	1.29	0.00	3.64	5.60	1.72	3.01	1.43	13.75
10070	0.00	8.27	5.29	0.00	41.50	2.41	0.01	0.00	0.53	2.11	0.00	1.79	0.08	1.93	5.15	4.23	3.44	0.33	22.92
10074	0.00	14.12	3.37	0.00	38.76	5.54	0.00	0.00	0.10	0.77	0.00	0.84	0.03	2.12	3.38	1.83	6.55	0.28	22.30
10073	0.90	14.81	2.98	0.00	41.82	5.53	0.00	0.15	0.05	3.01	0.07	5.10	0.00	3.04	13.29	0.01	2.91	1.08	5.26
10072	0.54	14.87	3.21	0.00	39.92	5.43	0.00	0.00	0.13	0.76	0.00	1.80	0.74	3.65	6.79	3.22	2.79	0.41	15.73
10074	0.61	12.62	4.91	0.00	39.24	5.65	0.00	0.36	0.07	1.10	0.00	2.36	0.00	3.45	11.13	3.28	2.64	0.24	12.33
10075	0.03	16.99	1.46	0.00	43.42	6.76	0.00	0.04	0.07	2.36	0.04	1.57	0.89	4.23	5.63	0.14	3.30	0.36	12.72
10072	0.00	16.44	1.70	0.00	38.74	7.70	0.19	0.26	0.02	1.58	0.00	2.59	0.13	2.26	8.03	3.05	3.41	0.54	13.39
10073	0.38	11.50	4.35	0.00	43.60	2.54	0.00	0.00	0.30	0.54	0.00	0.85	0.01	3.35	4.69	3.83	3.71	0.28	20.07
10075	0.00	15.64	3.24	0.00	43.96	4.58	0.00	0.31	0.05	1.32	0.00	1.07	0.00	2.82	7.42	2.87	3.68	0.00	13.04
10074	0.96	14.27	2.74	0.00	43.47	6.73	0.00	0.08	0.17	0.00	0.25	2.27	0.00	1.06	8.56	0.63	5.20	0.09	13.52
10075	0.00	14.35	3.75	0.00	37.29	6.93	0.00	0.07	0.01	0.00	0.87	1.61	0.00	2.72	11.69	4.74	3.15	0.30	12.53
10074	0.00	8.41	4.00	0.00	42.22	5.63	0.00	0.43	0.02	2.60	0.00	2.49	0.00	3.13	14.49	4.35	0.03	1.56	10.65
10075	0.00	17.51	2.13	0.00	37.57	7.69	0.00	0.06	0.00	1.39	0.00	1.60	0.28	2.71	8.22	3.96	3.91	0.05	12.91
10073	1.01	11.37	4.42	0.03	42.89	2.56	0.00	0.00	0.43	0.45	0.00	0.90	0.01	2.45	5.53	4.80	2.44	0.22	20.51
10070	0.66	17.03	3.11	0.00	40.88	5.11	0.00	0.04	0.02	1.21	0.00	0.89	0.04	3.43	6.91	3.06	3.37	0.78	13.46
10073	1.30	19.25	0.90	0.00	43.23	7.26	0.00	0.07	0.04	0.00	0.34	1.41	0.00	2.86	3.80	0.04	5.71	0.01	13.79
10073	1.37	18.27	2.61	0.00	43.40	4.96	0.00	0.00	0.00	0.72	0.00	1.88	0.03	1.99	4.60	0.76	5.53	0.57	13.32
10072	0.05	8.73	7.46	0.00	39.08	3.01	0.00	0.00	0.32	1.61	0.13	0.72	0.98	3.37	13.89	4.08	2.94	0.25	13.38
10074	3.63	14.18	2.13	0.00	40.53	5.35	0.00	0.70	0.10	0.38	0.09	2.82	0.02	3.00	8.52	0.00	4.72	0.16	13.66
10072	0.00	17.10	3.22	0.00	39.92	5.26	0.00	0.04	0.13	2.84	0.41	0.59	0.00	3.19	7.30	4.68	2.03	0.18	13.13
10076	0.00	14.05	1.65	0.00	41.27	8.59	0.00	0.08	0.03	1.51	0.08	2.82	0.00	1.78	9.28	1.82	4.22	0.37	12.46

10074	0.00	11.77	3.47	0.00	44.02	6.59	0.32	0.10	0.16	0.19	0.01	1.08	0.00	1.43	9.32	3.44	3.76	0.50	13.84
10075	0.03	19.52	1.14	0.00	37.62	8.52	0.00	0.09	0.51	0.09	0.04	2.64	0.00	2.78	6.44	1.10	5.39	0.23	13.86
10073	0.00	8.03	6.90	0.00	38.53	3.21	0.00	0.17	0.29	1.45	0.00	2.41	0.04	2.09	7.44	4.69	2.25	0.52	21.99
10075	0.00	13.64	2.40	0.00	34.17	8.49	0.25	0.10	0.03	0.86	0.11	3.92	0.00	4.60	11.45	3.60	1.06	2.02	13.31
10070	0.00	9.35	5.58	0.00	38.63	2.70	0.00	0.90	0.23	0.65	0.87	1.57	0.38	2.00	7.84	5.83	2.36	0.66	20.47
10073	0.00	11.17	2.92	0.01	44.41	5.33	0.00	0.34	0.62	3.78	0.08	2.42	0.00	2.22	10.96	2.51	2.45	0.43	10.37
10075	0.81	13.66	3.09	0.00	40.81	6.47	0.00	0.14	0.06	0.70	0.01	0.77	0.48	2.77	10.01	3.05	3.61	0.48	13.07
10071	0.00	16.87	4.03	0.00	44.27	4.49	0.00	0.06	0.08	1.37	0.01	0.69	0.00	1.60	5.21	0.00	7.73	0.13	13.45
10075	0.00	14.75	3.15	0.00	44.12	5.43	0.28	0.07	0.06	2.06	0.01	1.14	0.60	1.91	7.57	1.34	4.10	0.22	13.19
10075	0.98	17.10	1.48	0.00	41.47	7.66	0.00	0.01	0.09	0.00	0.04	1.20	0.07	1.67	5.55	1.00	5.99	0.12	15.58
10076	0.00	16.89	1.74	0.00	39.84	8.55	0.09	0.13	0.03	0.38	0.02	2.02	0.00	1.97	8.13	1.84	4.57	1.25	12.56
10070	1.51	11.60	3.15	0.00	42.33	6.97	0.00	0.08	0.11	0.00	0.01	3.27	0.10	2.74	11.05	2.17	2.77	0.62	11.51
10071	0.00	14.07	2.99	0.00	39.88	7.32	0.00	0.22	0.13	1.08	0.01	1.64	0.64	2.08	10.19	2.28	3.06	0.52	13.90
10075	0.76	13.45	2.10	0.00	41.38	6.64	0.00	0.02	0.10	0.92	0.00	0.92	0.00	2.65	8.71	3.64	2.57	0.65	15.50
10074	0.56	12.57	5.20	0.00	38.33	5.49	0.00	0.02	0.16	1.18	0.00	0.69	0.64	2.96	11.48	3.39	4.29	0.56	12.46
10074	2.06	12.58	5.10	0.00	37.05	5.02	0.00	0.09	0.19	0.53	0.03	2.08	0.56	1.96	11.70	3.86	3.81	0.47	12.89
10071	1.56	15.88	2.14	0.01	38.69	7.45	0.00	0.04	0.01	1.60	0.00	1.89	0.00	2.42	8.35	1.20	5.10	0.28	13.39
10076	0.00	13.69	1.65	0.00	42.19	8.66	0.55	0.14	0.08	0.49	0.02	2.69	0.02	1.96	10.15	3.03	2.20	0.25	12.24
10072	0.00	12.45	3.70	0.00	42.83	5.28	0.00	0.00	0.24	1.71	0.39	0.73	0.00	2.05	10.14	3.36	2.01	0.49	14.63
10071	0.01	11.47	4.09	0.00	41.21	5.45	0.00	0.00	0.08	0.92	0.96	1.61	0.31	2.25	9.88	4.09	1.30	2.02	14.36
10073	0.00	14.86	3.46	0.00	40.82	5.84	0.01	0.01	0.15	0.61	0.00	0.96	0.18	1.85	8.51	4.94	2.33	0.14	15.32
10074	0.88	13.56	0.98	0.00	45.41	6.87	0.00	0.09	0.10	1.02	0.06	0.75	0.78	3.64	8.23	2.15	2.18	0.18	13.13
10073	0.05	13.52	1.50	0.00	40.15	8.97	0.59	0.12	0.16	0.53	0.08	1.86	0.00	2.86	10.55	4.48	2.13	0.61	11.83
10071	0.89	18.46	2.63	0.00	40.78	5.98	0.00	0.32	0.15	0.00	0.00	0.83	0.01	4.65	5.74	3.05	1.76	1.31	13.44
10075	3.73	14.05	1.81	0.00	40.56	5.20	0.00	0.72	0.05	1.14	0.10	2.87	0.00	2.81	8.78	1.55	3.33	0.28	13.02
10074	3.45	15.82	2.27	0.00	43.17	2.17	0.00	0.60	0.02	2.04	0.00	0.66	0.00	2.81	6.20	2.75	3.49	0.01	14.55
10070	0.79	14.22	3.52	0.00	42.58	5.79	0.00	0.10	0.11	1.36	0.00	2.87	0.02	2.52	9.22	1.83	2.29	0.17	12.60
10075	0.00	13.24	1.84	0.00	43.80	7.56	0.14	0.08	0.09	2.49	0.06	1.45	0.01	2.28	8.52	2.82	2.30	0.74	12.59
10069	0.61	11.87	4.95	0.01	46.21	2.19	0.00	0.21	0.24	0.35	0.00	0.62	0.08	2.81	8.65	3.98	2.96	0.67	13.58

10075	0.00	15.91	1.33	0.00	43.65	7.78	0.00	0.25	0.02	2.30	0.04	1.96	0.00	1.62	6.77	0.87	4.50	0.02	12.99
10074	1.93	10.52	4.91	0.00	41.19	4.41	0.00	0.05	0.17	0.56	0.00	0.79	0.00	2.47	13.71	5.31	1.25	1.65	11.07
10072	0.77	19.70	1.68	0.01	39.06	7.49	0.03	0.26	0.03	0.00	0.04	2.02	0.04	2.74	5.82	1.41	5.41	0.54	12.96
10076	0.00	13.59	1.38	0.00	40.70	8.59	0.59	0.30	0.04	1.68	0.13	2.55	0.01	3.04	9.41	1.85	2.91	0.54	12.71
10074	0.97	16.86	1.52	0.00	41.98	7.57	0.00	0.06	0.05	0.00	0.05	1.08	0.19	2.18	6.99	1.66	4.80	0.11	13.91
10075	0.58	13.05	1.19	0.00	43.86	8.56	0.55	0.07	0.08	0.78	0.07	2.65	0.01	2.58	9.30	1.53	2.83	0.48	11.85
10073	0.00	15.28	4.44	0.00	38.80	6.96	0.00	0.15	0.05	0.00	0.01	3.80	0.00	2.38	10.60	1.02	4.10	0.64	11.78
10075	0.00	13.68	2.87	0.00	38.76	9.27	0.00	0.13	0.07	0.00	0.16	1.17	0.00	2.11	12.10	3.66	4.61	0.60	10.82
10074	0.01	14.09	3.28	0.00	45.26	2.29	0.00	0.69	0.17	4.04	0.00	1.22	0.05	2.39	6.56	2.64	1.72	0.07	15.52
10074	0.00	11.27	4.27	0.00	37.43	6.59	0.25	0.23	0.08	1.22	0.00	1.50	0.02	2.98	13.69	5.94	0.11	2.40	12.01
10068	0.00	15.69	3.46	0.00	41.24	6.03	0.00	0.04	0.04	0.05	0.17	1.46	0.55	3.39	7.88	2.44	4.17	0.57	12.80
10076	0.00	14.45	1.81	0.00	43.00	7.56	0.00	0.11	0.06	1.93	0.02	1.12	0.00	2.16	8.31	2.82	3.64	0.18	12.82
10071	0.03	15.14	2.15	0.00	38.53	9.09	0.00	0.56	0.06	0.05	0.00	0.89	0.27	3.25	9.51	3.88	2.49	1.63	12.46
10073	0.00	16.21	2.45	0.00	35.19	9.93	0.00	0.68	0.00	0.26	0.03	1.64	0.00	2.42	10.67	3.57	5.38	0.32	11.24
10075	0.08	15.80	1.98	0.00	35.97	10.37	0.21	0.08	0.01	1.67	0.50	1.53	0.00	1.37	8.98	2.19	4.61	1.52	13.14
10076	0.00	11.19	3.75	0.00	45.31	5.44	0.31	0.13	0.02	1.28	0.01	1.47	1.10	2.84	9.60	1.67	3.33	0.59	11.96
10076	0.68	18.44	1.02	0.00	40.46	8.13	0.00	0.06	0.06	0.62	0.02	0.67	0.43	2.21	5.53	0.04	5.82	0.43	15.37
10076	0.00	12.51	1.72	0.00	43.35	7.84	0.00	0.03	0.04	0.44	0.03	1.91	0.00	2.48	9.35	3.58	2.47	0.79	13.45
10074	0.00	15.77	3.12	0.00	40.23	6.37	0.00	0.06	0.02	1.20	0.04	2.59	0.02	2.28	8.03	2.44	4.62	0.56	12.66
10074	0.00	7.97	2.66	0.00	42.98	6.10	0.00	2.39	0.04	1.26	0.03	3.81	0.00	4.54	13.77	3.20	0.00	1.40	9.85
10073	0.08	10.68	5.65	0.00	38.64	5.93	0.00	0.13	0.14	2.36	0.00	1.12	0.02	3.08	13.83	3.98	2.58	0.57	11.22
10074	0.00	7.80	3.67	0.00	44.32	5.32	0.00	0.07	0.08	1.04	0.02	1.35	0.00	3.37	10.64	5.08	0.87	0.92	15.42
10074	0.56	12.77	4.09	0.00	40.09	4.93	0.00	0.06	0.10	1.76	0.74	2.56	0.08	1.76	8.25	2.47	4.38	0.28	15.14
10071	0.52	18.24	1.00	0.00	42.90	6.94	0.00	0.03	0.06	1.03	0.00	1.20	0.05	1.80	4.95	0.01	5.69	0.37	15.23
10073	0.32	15.17	2.70	0.00	39.72	9.55	0.00	0.76	0.01	0.01	0.88	3.49	0.00	2.29	14.49	1.82	1.82	1.84	5.13
10073.5	0.59	14.22	2.97	0.00	41.27	6.12	0.05	0.26	0.11	1.07	0.11	1.72	0.13	2.54	8.60	2.59	3.50	0.55	13.59
10037	1.46	0.03	1.86	0.46	2.08	10.73	0.00	0.19	5.62	14.96	0.06	0.07	0.00	3.52	0.56	5.09	7.04	0.00	46.28
10037	1.51	0.05	3.87	0.04	0.00	14.46	0.00	0.00	7.63	8.92	0.28	0.00	0.00	2.59	0.68	2.12	6.77	0.01	51.07
10037	1.96	0.11	7.32	0.21	0.00	14.09	0.00	0.00	5.23	9.92	0.10	0.04	0.05	1.71	0.37	0.00	5.14	0.00	53.76

10037	2.24	0.11	2.91	0.36	0.69	11.68	0.03	0.00	8.50	15.24	0.01	0.25	0.13	1.83	0.28	9.10	4.11	0.01	42.53
10037	0.83	0.08	4.11	0.10	1.41	11.91	0.12	0.00	2.05	12.14	4.10	0.03	0.00	5.16	0.94	0.00	4.79	0.03	52.20
10037	2.65	1.32	5.67	0.25	0.81	13.71	1.20	0.00	1.74	10.47	0.03	0.13	0.02	2.52	0.89	3.65	8.04	0.04	46.84
10037	1.10	0.18	2.86	0.41	1.40	14.74	0.00	0.00	3.46	10.09	0.55	0.21	0.00	5.56	0.91	5.36	9.15	0.03	44.00
10037	3.52	0.03	3.35	0.00	0.13	9.93	0.13	0.00	8.93	12.00	0.11	1.55	0.01	3.36	0.40	3.59	9.19	0.00	43.78
10037	1.09	0.04	3.36	0.22	1.96	12.11	0.00	0.00	1.71	16.85	2.86	1.18	0.10	2.58	0.22	1.33	4.36	0.00	50.02
10037	1.56	0.41	1.65	0.60	0.29	10.03	0.00	0.00	10.75	10.37	0.38	0.00	0.00	2.96	0.22	9.38	9.49	0.00	41.91
10037	0.78	0.11	5.65	0.00	0.00	11.76	0.18	0.00	6.70	11.82	0.36	0.19	0.02	9.35	0.17	1.70	2.53	0.01	48.69
10037	4.76	0.20	3.39	0.47	1.67	9.55	0.00	0.00	8.64	14.10	0.00	0.11	0.04	2.98	0.03	8.26	3.38	0.11	42.32
10037	1.22	0.18	4.35	1.14	1.75	12.82	0.11	0.00	3.41	11.35	0.34	1.11	0.00	4.16	0.56	1.51	6.52	0.01	49.46
10037	1.21	0.51	4.33	0.02	0.00	15.57	0.16	0.00	6.42	11.30	0.63	0.04	0.00	2.84	0.67	5.29	7.56	0.01	43.45
10037	1.20	0.23	2.74	0.21	0.74	11.41	0.17	0.15	7.25	9.14	0.32	0.05	0.00	3.16	0.36	4.56	9.61	0.00	48.68
10037	0.48	0.06	2.06	0.07	0.00	11.13	0.14	0.05	6.75	10.98	0.57	0.93	0.00	8.13	0.26	2.38	5.19	0.00	50.83
10037	3.56	0.07	3.80	0.00	0.00	10.19	0.18	0.00	7.61	15.98	3.10	0.34	0.11	1.80	0.09	15.74	3.02	0.00	34.42
10037	1.92	2.58	5.12	0.22	3.31	11.82	0.00	0.00	2.51	12.22	0.21	0.01	0.00	1.48	0.59	7.23	9.36	0.00	41.41
10037	2.07	1.97	4.77	0.00	0.00	11.48	0.00	0.00	6.86	16.06	0.83	0.00	0.01	1.85	0.28	7.56	4.41	0.00	41.83
10037	0.72	0.14	4.37	0.07	1.36	11.85	0.07	0.00	5.08	10.86	0.80	0.18	0.00	6.64	0.38	0.00	4.59	0.00	52.90
10037	0.85	0.11	6.49	0.12	1.06	11.97	0.00	0.00	2.58	12.20	0.27	0.11	0.01	6.39	0.29	1.89	4.19	0.00	51.48
10037	7.06	0.02	4.27	1.29	0.27	11.24	0.00	0.00	3.33	14.72	0.28	4.10	0.02	1.45	0.30	9.55	4.09	0.00	38.00
10037	2.22	0.15	4.32	0.35	6.24	11.73	0.09	0.00	1.82	11.21	0.21	1.15	0.02	1.74	0.08	14.25	9.63	0.00	34.81
10037	2.40	0.06	4.43	0.12	0.00	10.52	0.00	0.00	8.56	12.13	0.53	0.21	0.03	1.20	0.01	21.88	10.61	0.00	27.31
10037	1.00	0.02	7.22	0.02	0.00	14.79	0.03	0.00	4.00	9.96	0.91	0.18	0.00	3.44	0.82	4.76	4.74	0.09	48.04
10037	1.83	0.19	3.23	0.65	2.95	12.70	0.00	0.00	3.01	14.60	0.32	3.48	0.00	2.01	0.08	5.95	3.54	1.85	43.63
10037	5.87	0.04	4.87	0.00	0.00	7.97	0.00	0.00	7.05	17.05	0.54	0.25	0.00	1.56	0.14	8.94	4.15	0.00	41.56
10037	2.75	1.62	3.70	0.00	1.74	9.94	0.00	0.00	8.25	10.82	0.17	0.02	0.01	2.25	0.32	6.68	9.52	0.00	42.20
10037	1.23	0.95	7.76	0.07	1.63	14.87	0.00	0.00	0.13	11.66	0.52	0.00	0.01	1.10	0.13	3.53	7.67	0.00	48.75
10037	4.08	0.10	2.36	0.31	0.00	8.40	0.00	0.00	12.34	14.38	0.00	0.03	0.04	3.49	0.07	16.26	3.57	0.00	34.57
10037	1.94	0.03	9.54	0.00	2.59	17.78	3.13	0.00	0.00	9.49	0.33	1.13	0.00	1.71	0.82	2.58	4.96	0.08	43.87
10037	7.15	0.93	5.97	0.00	0.00	9.26	0.09	0.00	6.40	15.16	0.32	0.19	0.00	4.50	0.43	7.49	1.56	0.02	40.52

10037	3.70	0.10	6.37	0.61	0.30	11.03	1.46	0.00	3.19	13.25	0.22	0.13	0.00	1.48	0.17	3.49	7.35	0.00	47.15
10037	1.16	0.08	1.12	0.00	5.47	8.20	0.00	0.00	6.31	15.44	0.72	0.95	0.01	2.90	0.16	17.33	7.53	0.00	32.63
10037	1.49	0.29	4.15	0.17	0.00	11.81	0.00	0.00	9.52	9.61	0.48	0.00	0.00	3.71	0.57	8.03	8.09	0.00	42.07
10037	1.44	0.13	5.35	0.20	0.00	10.79	0.00	0.00	7.50	13.59	0.43	0.31	0.00	2.03	0.11	8.41	8.64	0.00	41.08
10037	1.99	0.01	4.24	0.40	0.00	10.16	0.00	0.00	8.93	11.51	0.07	0.37	0.23	1.87	0.10	8.08	8.29	0.00	43.76
10037	2.91	2.78	1.83	0.00	2.37	11.16	0.00	0.00	5.11	12.14	0.33	1.16	0.08	2.90	0.10	8.26	10.16	0.01	38.70
10037	6.19	1.78	4.60	0.01	0.04	12.77	0.00	0.00	5.26	11.56	0.30	1.41	0.02	1.52	0.23	8.02	4.21	0.00	42.07
10037	1.40	0.23	2.92	0.90	0.79	10.35	0.00	0.00	3.78	14.76	0.29	0.00	0.02	2.35	0.24	7.97	10.38	0.01	43.60
10037	1.97	0.07	6.12	0.83	5.40	13.81	0.00	0.00	0.33	10.55	0.31	1.19	0.00	1.84	0.71	3.78	8.93	0.05	44.11
10037	0.71	0.18	4.17	0.44	1.27	14.18	0.00	0.00	4.36	9.85	0.33	0.02	0.05	3.86	0.73	5.04	7.31	0.01	47.50
10037	1.89	0.05	4.32	0.00	0.03	12.19	0.00	0.00	10.54	9.47	0.10	0.04	0.04	1.69	0.21	4.56	7.82	0.00	47.05
10037	2.30	0.03	1.80	0.00	0.57	10.72	0.00	0.00	8.00	12.84	0.13	0.89	0.02	2.84	0.58	4.99	9.04	0.00	45.26
10037	2.35	0.03	1.73	0.00	0.66	7.58	0.00	0.00	9.47	16.51	0.50	0.29	0.01	3.31	0.30	8.78	8.37	0.01	40.13
10037	0.91	0.22	6.10	0.15	0.00	10.96	0.15	0.05	6.52	10.85	0.30	0.04	0.01	7.51	0.11	3.66	4.56	0.00	47.89
10037	1.05	0.03	2.82	0.04	0.00	12.30	0.03	0.00	8.14	12.98	0.61	2.60	0.12	4.32	0.30	1.43	3.98	0.00	49.26
10037	1.64	0.11	2.97	0.41	1.44	9.43	0.01	0.00	8.99	11.91	0.27	1.75	0.02	2.19	0.19	7.18	9.52	0.01	41.96
10037	0.53	0.08	7.75	0.02	0.24	14.58	0.00	0.00	4.29	9.23	0.60	0.00	0.02	6.11	0.50	5.07	4.13	0.02	46.83
10037	4.24	2.15	4.36	0.06	0.26	11.81	0.00	0.00	6.88	15.06	0.00	0.08	0.02	1.54	0.03	18.03	3.95	0.00	31.52
10037	1.70	0.00	2.43	0.00	1.92	9.76	0.00	0.00	5.60	13.64	2.78	0.09	0.00	2.64	0.54	3.22	9.54	0.04	46.09
10037	5.68	0.29	3.60	0.51	0.00	8.72	0.00	0.05	9.83	12.76	0.03	3.16	0.20	1.88	0.00	5.41	4.54	0.02	43.32
10037	1.25	0.06	4.70	0.30	4.83	12.68	0.00	0.00	2.52	12.79	0.52	1.74	0.26	3.19	0.50	0.01	6.48	0.02	48.15
10037	1.40	0.03	3.88	0.00	0.14	9.66	0.00	0.00	8.10	12.28	3.01	0.10	0.04	2.14	0.15	6.79	11.19	0.03	41.06
10037	2.60	0.03	1.33	0.34	2.24	8.91	0.23	0.00	10.63	14.21	0.36	3.43	0.09	2.46	0.00	13.85	4.51	0.00	34.79
10037	1.86	0.10	5.50	0.77	0.00	11.82	0.01	0.00	5.45	9.92	0.34	0.03	0.01	6.75	0.25	5.08	5.64	0.02	46.46
10037	2.24	0.07	5.00	0.03	0.00	13.13	0.00	0.00	3.77	13.15	0.73	0.07	0.00	2.30	0.77	0.00	5.97	0.05	52.71
10037	0.68	0.18	6.06	0.32	0.02	16.04	0.00	0.00	2.48	9.83	0.53	0.00	0.00	2.81	0.20	0.10	7.78	0.00	52.97
10037	1.52	0.32	7.05	0.00	0.87	13.77	0.00	0.00	5.08	10.26	0.22	0.11	0.01	1.60	0.53	0.12	8.45	0.06	50.04
10037	0.98	0.02	4.63	0.62	0.02	10.75	0.00	0.00	8.72	12.72	0.18	1.18	0.00	2.94	0.29	1.40	7.87	0.03	47.65
10037	2.28	0.16	3.31	1.92	0.06	12.69	0.00	0.00	8.11	9.98	0.04	0.02	0.02	3.42	0.34	4.92	5.70	0.00	47.04

10037	1.42	0.01	8.30	1.12	0.08	13.08	0.00	0.00	0.04	11.18	0.52	0.28	0.00	7.00	0.65	4.77	4.08	0.06	47.42
10037	2.59	2.17	4.97	0.15	0.16	12.44	0.00	0.00	8.72	10.12	1.11	0.10	0.00	1.89	0.15	6.88	4.05	1.85	42.64
10037	1.29	0.32	2.88	0.80	4.09	12.78	1.66	0.00	0.74	11.27	0.70	0.12	0.04	3.26	0.47	5.27	9.17	0.01	45.12
10037	1.56	0.18	4.05	0.01	0.00	15.09	2.50	0.00	5.44	10.50	0.27	1.06	0.07	1.82	0.21	3.40	6.33	0.00	47.49
10037	1.33	0.02	4.17	0.12	0.00	15.18	4.68	0.00	2.02	10.66	0.18	1.87	0.09	1.86	0.12	1.78	6.65	0.00	49.26
10037	2.23	0.02	2.29	0.42	0.59	7.36	0.00	0.00	8.27	16.68	0.03	2.68	0.03	2.87	0.00	7.23	8.78	0.01	40.52
10037	1.00	2.47	4.91	1.44	0.23	15.16	0.00	0.00	2.61	11.29	0.44	0.14	0.00	1.85	0.76	3.26	8.67	0.08	45.69
10037	1.25	0.07	3.03	0.21	1.15	11.39	0.00	0.00	5.07	13.51	3.18	0.13	0.05	2.33	0.39	3.07	5.31	0.00	49.86
10037	1.41	0.06	4.50	1.01	0.00	12.09	0.00	0.09	6.20	11.62	0.26	0.02	0.00	3.65	0.38	1.80	7.29	0.01	49.63
10037	2.52	0.00	8.84	0.00	4.03	11.06	0.00	0.00	3.03	11.66	0.40	0.07	0.00	1.53	0.15	3.10	6.79	0.01	46.81
10037	6.21	1.76	4.29	0.07	0.10	6.29	0.00	0.00	3.84	15.92	0.36	1.64	0.00	2.18	0.12	6.79	8.97	0.11	41.34
10037	1.87	0.06	4.95	0.20	0.26	13.83	0.00	0.00	7.46	15.68	0.34	0.12	0.00	2.42	0.38	7.94	3.99	0.04	40.46
10037	1.44	0.07	3.45	0.31	0.24	10.34	1.18	0.00	5.50	16.90	3.33	0.02	0.00	2.09	0.42	2.95	4.78	0.00	46.97
10037	0.55	0.05	6.74	0.05	3.73	14.46	0.00	0.22	0.00	11.29	1.36	0.12	0.00	1.40	0.97	1.53	8.39	0.05	49.08
10037	2.46	0.12	4.16	0.08	6.83	13.63	0.28	0.00	0.03	15.21	0.13	0.12	0.00	1.63	0.46	7.55	5.80	0.06	41.47
10037	0.93	0.23	2.11	0.16	0.00	13.55	1.50	0.29	6.17	12.11	0.56	1.78	0.01	4.06	0.59	1.33	4.58	0.03	50.01
10037	1.78	0.68	7.33	0.01	0.00	13.98	0.00	0.00	2.84	8.58	0.67	0.10	0.00	6.53	0.79	3.22	4.88	0.13	48.49
10037	2.84	0.12	5.43	0.29	0.35	11.98	0.00	0.00	2.97	13.94	0.35	0.22	0.05	2.83	0.66	1.61	6.60	0.00	49.76
10037	3.30	0.05	4.80	0.00	1.51	8.57	0.00	0.00	5.83	14.97	0.24	0.23	0.01	3.95	0.45	8.56	7.14	0.02	40.37
10037	1.79	0.18	4.65	0.06	4.04	14.58	0.33	0.00	0.47	13.37	0.01	1.10	0.00	3.63	0.62	3.52	4.51	0.00	47.16
10037	1.59	0.07	4.76	0.71	0.04	15.57	0.00	0.00	6.86	8.45	0.14	0.10	0.02	2.28	0.40	0.00	3.78	1.71	53.54
10037	1.44	0.11	1.97	0.01	2.31	11.53	0.00	0.00	8.95	10.47	0.17	0.04	0.00	3.14	0.43	4.11	8.03	0.00	47.30
10037	3.25	0.88	7.10	0.03	3.17	13.07	2.49	0.00	0.00	5.19	0.07	0.03	0.00	2.11	0.03	1.93	13.83	0.00	46.82
10037	1.60	0.04	0.55	0.49	2.29	7.77	0.00	0.00	6.17	16.59	0.27	0.00	0.06	3.20	0.28	8.43	11.61	0.00	40.65
10037	1.92	0.10	1.28	0.62	4.83	9.75	0.00	0.01	5.88	12.22	0.20	1.44	0.04	4.93	0.15	7.15	8.32	0.02	41.16
10037	2.19	0.14	6.27	0.11	0.00	13.87	0.08	0.00	7.82	9.22	0.22	0.01	0.00	1.39	0.37	5.23	6.65	0.00	46.44
10037	1.80	0.03	2.93	0.08	0.13	15.48	0.00	0.00	4.94	11.27	0.29	0.08	0.03	4.59	0.70	0.00	5.75	0.01	51.90
10037	2.61	1.91	3.71	0.79	2.04	11.89	0.00	0.00	5.10	15.67	0.02	0.91	0.03	2.56	0.12	7.27	3.57	0.00	41.79
10037	2.33	2.20	4.44	0.00	2.14	9.10	0.00	0.00	8.50	9.10	0.12	0.26	0.01	2.74	0.22	3.00	9.37	0.04	46.42

10037	2.05	0.19	3.23	0.70	1.04	11.38	0.00	0.00	6.93	14.92	0.47	1.68	0.02	2.01	0.42	6.98	4.05	0.00	43.93
10037	0.84	0.01	4.30	0.01	2.12	11.70	0.00	0.00	2.15	15.40	1.05	1.61	0.00	3.90	0.43	1.54	5.11	0.02	49.83
10037	0.95	0.06	6.86	0.05	5.29	15.06	0.00	0.00	1.67	11.80	0.32	0.07	0.00	1.19	0.42	1.25	4.33	0.00	50.67
10037	1.71	0.24	1.36	0.22	5.72	10.15	0.00	0.00	5.96	10.39	0.16	0.09	0.05	2.95	0.21	7.58	9.85	0.13	43.26
10037	1.35	0.30	5.03	0.00	0.00	13.07	0.22	0.00	7.61	11.74	0.63	1.81	0.02	5.37	0.35	0.00	4.05	0.00	48.45
10037	0.48	0.01	7.83	0.04	0.00	16.53	0.00	0.00	1.79	13.90	0.46	0.16	0.00	4.72	0.42	0.01	1.36	0.04	52.24
10037	6.56	0.02	1.94	0.01	1.18	4.80	0.26	0.00	5.72	16.94	0.48	1.25	0.01	6.03	0.24	7.11	5.98	0.00	41.49
10037	0.74	0.24	4.00	0.22	0.00	9.08	0.00	0.00	8.61	13.62	0.13	1.70	0.03	6.53	0.23	3.64	4.00	0.03	47.20
10037	0.08	0.00	5.71	0.02	0.17	14.65	0.00	0.00	0.32	11.73	0.64	0.06	0.05	7.00	1.49	0.09	5.37	0.07	52.55
10037	1.42	0.14	3.01	0.14	0.00	14.48	0.05	0.00	6.93	9.71	0.76	0.12	0.04	3.14	0.49	0.00	5.22	0.00	54.36
10037	2.09	0.38	4.34	0.28	1.23	11.90	0.23	0.01	5.41	12.36	0.56	0.62	0.03	3.20	0.37	5.21	6.49	0.07	45.23

Appendix 4C: Maxent Permutation Importances for 120,000 Years Ago

Bio1	Bio2	Bio3	Bio4	Bio5	Bio6	Bio7	Bio8	Bio9	Bio10	Bio11	Bio12	Bio13	Bio14	Bio15	Bio16	Bio17	Bio18	Bio19
0.00	12.44	0.39	0.00	0.03	0.24	0.00	1.02	0.13	0.01	0.35	2.03	0.10	23.56	58.48	0.27	0.00	0.93	0.00
0.00	42.77	3.36	0.00	0.09	0.00	0.00	0.37	1.33	0.04	0.00	9.46	0.00	9.37	2.47	0.16	0.00	0.46	30.12
0.00	53.86	2.46	0.00	0.08	0.00	0.00	0.01	0.33	0.02	0.00	6.84	0.00	14.66	16.07	0.00	0.00	2.79	2.86
1.76	90.40	0.23	0.00	0.21	0.04	0.00	0.36	0.10	0.00	0.23	0.77	0.00	3.45	0.43	0.53	0.00	0.14	1.35
0.00	14.55	0.36	0.00	0.02	0.50	0.00	2.19	0.49	0.00	0.37	1.33	0.09	25.48	52.44	0.59	0.00	1.59	0.00
0.00	24.25	1.98	0.00	0.00	0.00	0.00	0.00	0.90	0.07	0.00	3.57	0.42	10.97	1.72	0.69	0.02	0.73	54.67
0.00	23.30	8.03	0.11	0.87	0.00	0.00	0.17	0.59	0.09	0.00	8.39	0.88	21.11	16.66	0.00	0.00	1.90	17.91
0.00	14.50	3.12	0.42	0.11	0.00	0.00	0.02	0.91	0.00	0.81	7.61	0.00	18.13	34.44	0.00	0.73	0.53	18.68
10.86	78.98	0.43	0.00	0.08	0.00	0.00	0.74	0.23	0.00	0.68	0.90	0.00	4.25	0.42	0.53	0.06	0.60	1.23
0.00	16.83	8.90	0.06	0.00	4.61	0.00	0.00	1.21	0.02	0.00	5.29	43.91	7.33	1.46	0.09	1.21	4.26	4.82
0.00	22.17	1.63	0.00	0.16	1.83	0.00	0.21	2.19	0.00	0.00	11.02	0.00	9.14	38.66	0.00	0.16	1.54	11.30
17.69	77.20	0.00	0.00	0.04	0.05	0.00	0.52	0.23	0.00	1.51	0.85	0.07	0.57	0.82	0.35	0.01	0.09	0.00
0.00	12.15	1.24	0.00	0.05	0.16	0.00	4.84	0.84	0.01	0.32	4.82	0.00	14.16	58.13	0.09	0.10	2.75	0.34
0.00	24.07	0.96	0.00	0.09	20.44	0.00	0.00	5.72	0.06	0.00	3.00	0.43	8.95	8.31	0.29	0.34	1.71	25.64
0.00	16.45	2.46	0.00	0.00	0.29	0.00	0.87	2.73	0.00	0.00	10.37	0.00	17.53	7.02	0.00	0.00	4.68	37.60
0.01	12.94	10.09	0.42	1.58	0.00	0.00	0.02	2.60	0.00	0.00	10.33	0.00	10.16	3.03	0.00	0.64	0.68	47.51
0.51	90.65	0.11	0.00	0.08	0.21	0.00	0.93	0.20	0.00	1.28	1.09	0.27	1.01	3.26	0.33	0.00	0.00	0.08
0.00	28.31	8.32	0.00	0.59	0.02	0.00	0.02	0.90	0.00	0.00	11.39	9.23	23.86	1.76	0.00	2.38	4.63	8.57
2.40	87.00	0.26	0.00	0.02	0.00	0.00	0.91	0.19	0.00	0.73	2.59	0.00	3.26	0.00	0.00	0.00	0.33	2.31

0.00	18.74	3.24	0.00	0.11	0.25	0.00	0.79	1.24	0.00	0.50	4.86	0.00	9.44	46.78	0.57	0.00	2.15	11.33
0.00	32.86	1.33	0.00	0.08	2.22	0.00	0.10	3.59	0.00	0.03	5.58	0.44	4.97	32.81	0.00	0.20	0.57	15.22
0.00	10.81	2.80	0.00	0.13	1.88	0.00	0.19	0.38	0.00	0.00	7.79	0.00	9.73	57.43	0.00	0.01	1.71	7.14
0.00	27.92	1.37	0.00	0.04	0.00	0.00	1.01	0.61	0.00	0.18	4.22	0.26	22.53	36.26	0.12	0.27	2.67	2.54
0.00	19.91	1.98	0.00	0.07	0.76	0.00	0.00	1.56	0.02	0.02	3.75	0.00	10.83	44.03	0.30	0.27	1.71	14.79
10.70	76.63	0.49	0.00	0.27	0.21	0.00	1.34	0.48	0.05	1.17	0.79	0.01	5.02	0.87	0.53	0.00	0.78	0.68
0.00	29.49	2.69	0.00	0.10	11.41	0.00	0.00	4.57	0.00	0.10	9.25	13.11	3.53	0.83	0.00	0.97	1.42	22.54
0.00	21.36	2.08	0.00	0.02	0.69	0.00	0.00	0.55	0.00	0.00	5.14	0.83	15.48	1.13	0.00	0.06	2.23	50.44
0.00	15.78	0.11	0.00	0.01	0.16	0.00	1.84	0.17	0.07	0.78	4.35	0.00	30.16	43.09	0.07	0.02	3.39	0.00
0.00	27.88	6.02	0.00	0.08	0.51	0.00	0.00	1.33	0.00	0.00	5.96	4.29	11.12	1.72	0.55	0.00	2.15	38.38
0.00	10.26	3.60	0.00	0.05	0.09	0.00	1.02	0.53	0.02	0.00	4.47	0.00	13.76	61.30	0.11	0.03	1.39	3.37
0.00	73.69	0.71	0.00	0.14	0.00	0.00	0.82	0.44	0.00	0.79	1.51	0.15	6.12	13.46	0.82	0.00	0.33	1.04
0.00	47.73	4.92	0.00	0.28	0.00	0.00	0.48	0.04	0.00	0.00	6.88	5.06	15.50	11.87	0.00	3.25	3.44	0.53
0.00	28.74	2.96	0.00	0.08	4.67	0.00	0.00	2.32	0.00	0.00	2.79	0.26	3.83	1.82	0.20	0.26	1.06	51.02
0.00	15.61	1.95	0.00	0.08	0.00	0.00	0.60	0.53	0.00	0.00	5.04	0.00	4.20	69.26	0.97	0.05	0.00	1.72
0.00	21.95	1.39	0.00	1.39	0.96	0.00	2.32	1.37	0.00	0.53	8.26	0.00	17.15	37.47	0.62	0.17	0.56	5.87
0.00	10.48	0.86	0.00	0.02	0.01	0.00	0.70	0.05	0.00	0.60	3.80	0.00	17.25	64.97	0.09	0.00	1.06	0.10
0.00	17.89	0.13	0.00	0.79	4.05	0.00	0.19	0.07	0.00	0.03	3.97	0.00	5.01	60.04	0.23	0.40	4.45	2.76
0.00	20.67	1.10	0.00	0.11	0.40	0.00	1.06	0.00	0.00	0.00	6.34	0.09	6.69	62.46	0.00	0.00	0.01	1.07
0.00	14.19	5.24	0.19	0.14	5.86	0.00	0.00	1.64	0.00	0.00	1.52	0.09	5.26	0.57	0.20	0.29	0.75	64.05
0.00	55.92	3.22	0.04	0.09	0.00	0.00	0.44	0.67	0.02	0.00	2.44	1.08	9.94	23.82	0.28	0.00	1.59	0.44
0.00	78.66	0.21	0.00	0.09	0.00	0.00	0.82	0.69	0.00	0.00	3.03	0.00	4.57	3.02	0.00	0.04	0.31	8.57
0.00	59.44	4.52	0.03	0.09	0.08	0.00	1.49	0.15	0.30	0.00	7.23	0.74	6.29	12.75	0.07	0.44	3.48	2.89
0.00	11.92	2.13	0.03	0.07	4.71	0.00	0.00	2.69	0.00	0.10	4.57	0.12	4.50	53.50	0.00	0.49	1.23	13.95
0.00	57.07	0.90	0.00	0.10	0.00	0.00	5.76	1.16	0.00	3.08	9.86	0.44	13.94	2.46	0.00	0.00	1.58	3.65
0.00	35.50	1.78	0.00	0.03	0.00	0.00	2.34	2.11	0.04	0.52	2.79	0.00	10.65	41.10	0.96	0.14	0.31	1.74
0.00	16.19	1.23	0.00	0.07	0.21	0.00	0.72	0.11	0.00	1.25	4.45	0.00	10.35	64.33	0.07	0.00	1.02	0.00
0.00	12.08	4.03	0.00	0.28	0.00	0.00	8.76	1.23	0.00	0.32	1.40	0.00	13.49	50.97	1.57	0.10	2.47	3.31
0.00	78.00	0.88	0.04	0.31	0.00	0.00	1.72	0.67	0.04	1.19	7.75	0.00	4.18	2.86	0.00	0.00	0.24	2.13

0.00	7.44	3.11	0.00	0.07	14.42	0.00	0.00	2.38	0.01	0.00	6.93	0.00	3.67	9.67	0.00	0.27	1.66	50.38
0.00	19.33	0.54	0.00	0.03	0.22	0.00	1.71	0.23	0.00	0.58	2.02	0.00	20.06	53.14	0.43	0.00	1.72	0.00
0.00	23.54	2.71	0.00	0.04	1.12	0.00	0.61	2.56	0.03	0.46	8.40	0.78	6.20	48.06	0.42	1.45	1.11	2.53
0.00	17.63	0.05	0.00	0.29	0.21	0.00	2.46	0.79	0.00	0.72	3.15	0.00	21.27	52.09	0.23	0.08	0.92	0.09
0.00	5.48	1.80	0.00	0.03	0.38	0.00	1.00	0.55	0.00	0.09	4.03	0.08	28.08	57.34	0.02	0.05	0.82	0.26
0.00	31.10	2.20	0.04	0.35	0.00	0.00	0.36	1.50	0.00	0.00	6.43	0.00	6.93	48.15	0.00	0.00	0.18	2.76
0.00	25.58	1.88	0.00	0.00	0.00	0.00	1.61	1.77	0.01	0.05	5.41	0.11	14.73	46.72	0.07	0.11	0.34	1.62
0.01	11.24	1.58	0.00	0.10	0.13	0.00	0.05	1.17	0.00	0.64	2.68	0.26	3.93	1.93	0.17	0.04	0.25	75.80
0.00	40.90	0.57	0.00	0.04	0.12	0.00	5.73	0.16	0.00	0.25	1.93	0.00	17.77	30.49	0.30	0.07	1.67	0.00
0.00	17.82	1.25	0.00	0.05	0.00	0.00	0.74	0.71	0.01	0.23	4.03	0.61	20.52	52.19	0.25	0.05	1.39	0.15
0.00	18.80	1.33	0.00	0.06	0.00	0.00	0.27	1.40	0.00	0.29	7.25	0.09	17.16	38.95	0.00	0.36	1.25	12.79
0.00	10.75	3.89	0.03	0.06	1.11	0.00	0.15	0.78	0.00	0.00	6.84	0.00	9.19	3.25	0.00	0.00	1.81	62.17
0.00	16.37	1.36	0.00	0.08	0.28	0.00	0.19	1.70	0.03	0.07	2.87	0.14	17.59	55.07	0.17	0.19	1.83	2.07
0.00	4.68	3.77	0.00	0.02	0.00	0.01	1.99	0.38	0.00	0.32	3.63	0.10	20.32	60.44	0.00	0.52	2.50	1.33
0.00	39.94	3.52	0.00	0.04	0.01	0.00	1.10	0.19	0.17	0.00	2.11	0.03	8.63	39.57	0.30	0.02	0.91	3.46
0.00	13.73	0.29	0.00	0.10	0.78	0.00	4.69	0.47	0.00	0.26	2.81	0.21	14.05	62.02	0.24	0.00	0.36	0.00
0.00	22.63	1.43	0.00	0.04	11.70	0.00	0.00	3.02	0.13	0.02	5.73	0.00	8.75	22.31	0.00	0.24	2.74	21.27
0.00	24.71	2.79	0.08	0.21	15.46	0.00	0.00	2.18	0.00	0.27	3.58	30.24	10.11	3.29	0.00	0.13	6.62	0.34
0.00	13.96	6.44	0.00	1.10	3.18	0.00	0.10	2.45	0.00	0.00	9.42	4.37	20.54	1.27	0.26	0.19	1.87	34.86
0.00	60.10	0.34	0.00	0.09	1.64	0.00	1.97	0.76	0.00	0.98	1.58	0.53	11.61	16.27	0.77	0.00	1.19	2.17
0.00	18.70	0.39	0.00	0.04	0.16	0.00	3.59	0.27	0.01	0.53	3.29	0.00	7.28	65.07	0.42	0.00	0.26	0.00
0.00	64.87	1.17	0.00	0.09	0.32	0.00	1.80	1.31	0.00	0.00	4.77	0.35	7.43	12.34	0.40	0.03	0.52	4.61
0.00	51.53	0.30	0.00	0.05	0.00	0.00	1.68	0.31	0.03	3.60	3.95	0.00	12.18	24.35	0.34	0.00	1.02	0.65
0.00	21.42	2.13	0.00	0.27	0.00	0.00	0.87	0.82	0.00	0.00	3.92	0.05	29.92	0.08	0.05	0.00	0.50	39.98
0.00	15.13	0.95	0.00	0.07	0.74	0.00	11.39	0.77	0.00	0.03	5.63	0.05	6.23	58.64	0.00	0.00	0.39	0.00
0.00	23.23	1.01	0.00	0.30	0.00	0.00	2.34	0.51	0.00	1.78	2.90	0.09	8.43	54.61	0.84	0.37	1.13	2.48
0.00	28.61	7.18	0.17	0.45	0.67	0.00	0.00	3.38	0.04	0.06	7.65	0.47	12.37	7.80	0.00	0.86	2.22	28.08
0.00	16.81	2.03	0.00	0.07	0.26	0.00	2.64	0.65	0.03	0.21	6.23	0.00	3.23	67.56	0.00	0.00	0.00	0.28
0.00	13.29	2.30	0.00	0.09	1.10	0.00	0.30	1.25	0.00	0.00	3.30	0.00	4.83	67.74	0.13	0.96	2.93	1.79

23.68	59.92	2.95	0.80	0.33	0.00	0.22	0.27	0.10	0.00	1.00	3.74	0.85	3.76	0.55	0.23	0.00	0.73	0.88
0.00	18.11	0.26	0.00	0.14	0.07	0.00	3.35	0.49	0.00	1.03	6.47	0.00	32.00	33.74	0.00	0.00	3.88	0.47
0.00	34.10	0.73	0.00	0.05	0.00	0.00	0.89	0.23	0.00	0.76	4.29	0.16	9.49	48.34	0.00	0.01	0.23	0.71
0.00	14.88	0.21	0.00	0.09	0.31	0.00	1.35	0.56	0.02	0.75	1.13	0.04	20.51	58.28	0.60	0.00	1.27	0.00
0.00	6.68	0.75	0.00	0.03	0.28	0.00	3.02	0.22	0.00	0.04	4.67	0.00	13.82	70.16	0.13	0.00	0.19	0.00
0.00	9.81	0.56	0.00	0.02	0.15	0.00	2.63	0.09	0.00	0.62	0.85	0.00	19.31	64.46	0.48	0.00	1.02	0.00
0.00	30.87	1.62	0.00	0.06	0.58	0.00	0.00	1.19	0.02	0.00	1.46	0.33	15.85	0.00	0.94	0.00	0.46	46.63
0.00	14.68	1.00	0.00	0.02	0.82	0.00	1.12	0.87	0.00	0.00	4.19	0.07	14.41	56.93	0.00	0.32	3.74	1.83
0.00	21.69	3.63	0.01	0.22	0.00	0.00	0.00	0.29	0.00	0.24	4.25	0.05	15.49	50.50	0.00	0.00	0.94	2.68
0.00	13.13	0.83	0.00	0.06	0.31	0.00	1.86	0.27	0.00	0.35	2.97	0.00	21.93	56.28	0.35	0.04	1.20	0.41
0.00	27.45	3.27	0.00	0.62	0.11	0.00	0.31	0.85	0.00	0.00	2.01	0.29	37.59	13.66	0.00	0.00	5.85	7.99
0.00	11.63	0.33	0.00	0.06	0.34	0.00	2.23	0.00	0.00	0.28	3.03	0.03	10.43	71.24	0.23	0.00	0.11	0.06
0.00	12.86	1.68	0.00	0.07	0.00	0.00	0.68	0.09	0.00	1.44	3.06	0.00	12.04	66.82	0.23	0.00	0.82	0.22
0.00	6.67	0.71	0.00	0.08	0.00	0.00	5.54	0.08	0.05	0.14	3.92	0.13	8.13	74.10	0.14	0.00	0.25	0.07
0.10	79.26	1.04	0.00	0.65	0.00	0.00	1.77	0.81	0.03	1.37	3.18	0.23	4.98	1.55	0.47	0.00	0.52	4.04
0.00	25.68	1.17	0.00	0.10	0.89	0.00	0.47	0.20	0.00	0.58	6.80	0.00	31.45	18.75	0.17	0.00	6.19	7.56
0.00	17.94	0.58	0.00	0.05	0.09	0.00	1.07	0.14	0.00	0.72	6.08	0.00	7.13	65.87	0.00	0.00	0.32	0.00
0.00	11.98	0.61	0.00	0.01	0.00	0.00	1.32	0.04	0.04	0.41	1.08	0.00	31.43	48.53	0.25	0.00	4.29	0.00
0.00	7.71	1.74	0.00	0.12	0.03	0.00	6.44	0.94	0.04	0.00	3.00	0.46	9.82	69.23	0.01	0.03	0.26	0.15
0.00	14.77	1.27	0.00	0.00	0.00	0.00	0.72	0.58	0.05	0.13	1.41	0.00	22.71	52.92	0.39	0.11	4.66	0.29
0.00	19.23	4.81	0.05	0.17	0.00	0.00	2.70	2.05	0.03	0.52	13.70	2.82	26.67	15.92	0.79	0.00	3.76	6.79
0.00	74.40	2.00	0.00	0.15	0.00	0.00	0.29	0.56	0.01	0.00	1.44	2.64	5.49	0.93	0.44	1.51	2.55	7.60
0.00	7.87	0.92	0.00	0.07	0.18	0.00	1.90	0.04	0.01	0.16	4.04	0.00	16.18	68.07	0.20	0.00	0.35	0.00
0.68	29.11	2.09	0.03	0.17	1.26	0.00	1.37	0.98	0.02	0.39	4.61	1.29	12.86	32.76	0.24	0.21	1.58	10.36
48.38	0.05	0.81	0.00	0.00	0.00	0.00	0.00	1.11	0.39	12.26	0.04	0.00	12.99	3.54	0.08	0.00	0.01	20.35
40.01	0.09	0.64	0.36	0.00	0.00	0.00	0.00	0.09	0.58	14.08	0.00	0.00	5.99	4.45	0.00	0.00	0.06	33.64
70.20	0.12	2.39	0.06	0.00	0.21	0.00	0.00	0.00	0.00	5.50	0.01	0.06	6.26	1.71	0.00	0.00	0.00	13.47
82.72	0.08	1.00	0.00	0.00	0.19	0.00	0.00	0.03	0.00	0.03	4.87	0.22	8.30	1.73	0.06	0.00	0.00	0.76
21.08	0.42	0.63	2.02	0.00	0.00	0.00	0.00	0.07	8.13	20.08	0.17	0.00	9.35	7.48	0.00	0.00	0.12	30.44

71.11	0.07	3.97	0.00	0.00	0.00	0.00	0.00	0.00	1.47	0.07	0.00	0.00	12.05	1.64	9.42	0.16	0.04	0.00
0.90	0.40	0.00	0.47	0.00	0.00	0.00	0.00	0.18	56.66	21.73	0.00	0.01	7.36	4.39	7.50	0.18	0.20	0.02
66.67	0.05	1.05	0.00	0.00	0.00	0.00	0.00	0.00	1.09	11.59	0.01	0.00	17.20	0.69	0.84	0.78	0.00	0.02
35.27	0.19	2.07	0.07	0.00	0.00	0.00	0.00	0.00	5.44	12.09	1.72	0.57	13.67	3.50	0.00	0.00	0.00	25.40
41.76	0.59	0.00	2.83	0.00	0.00	0.00	0.00	0.00	18.84	19.51	0.00	0.00	8.65	1.22	6.39	0.16	0.00	0.04
17.37	0.02	0.85	0.00	0.00	0.00	0.00	0.00	0.01	25.37	35.92	0.00	0.02	8.73	2.29	0.00	0.04	0.00	9.37
78.95	0.10	0.92	0.01	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	12.77	0.06	6.85	0.16	0.00	0.00
18.88	0.35	0.18	0.77	0.00	0.00	0.00	0.00	0.09	33.96	23.90	0.39	0.01	14.75	3.56	0.00	0.19	0.06	2.91
4.14	0.28	0.02	0.01	0.00	0.00	0.00	0.00	0.00	47.07	32.60	0.00	0.00	6.70	2.46	6.44	0.22	0.05	0.00
76.73	0.22	1.97	1.39	0.00	0.00	0.00	0.00	0.00	1.44	3.88	0.07	0.00	10.00	1.84	0.60	0.25	0.00	1.60
23.10	0.70	0.18	2.64	0.00	0.00	0.00	0.00	0.74	3.83	30.32	0.21	0.00	9.27	2.68	0.00	1.04	0.00	25.28
80.74	0.03	0.76	0.00	0.00	0.00	0.00	0.00	0.23	0.02	1.55	3.49	0.09	9.29	0.47	3.29	0.00	0.00	0.02
31.62	0.17	0.15	0.00	0.00	0.00	0.00	0.00	0.00	25.28	22.77	0.00	0.00	10.46	2.23	7.31	0.00	0.00	0.00
78.52	0.08	1.53	0.00	0.00	0.00	0.00	0.00	0.00	0.34	2.50	0.00	0.00	14.33	0.10	2.04	0.56	0.00	0.00
8.68	0.30	0.13	0.35	0.00	0.00	0.00	0.00	0.00	33.18	28.27	0.20	0.00	8.26	4.39	0.00	0.00	0.00	16.24
12.48	1.09	0.33	1.98	0.00	0.00	0.00	0.00	3.58	17.05	33.12	0.97	0.49	12.27	5.14	0.00	0.00	0.00	11.50
64.88	0.05	0.34	0.13	0.00	0.00	0.00	0.00	0.00	0.59	16.84	0.05	0.00	15.19	0.54	0.74	0.52	0.00	0.13
30.85	0.44	0.00	0.91	0.00	0.00	0.00	0.00	0.00	38.92	8.16	0.08	0.01	17.24	0.00	0.27	3.09	0.00	0.02
51.77	0.05	0.70	0.01	0.00	0.00	0.00	0.00	0.00	7.74	25.36	0.56	0.04	12.05	0.00	0.02	1.71	0.00	0.00
32.57	0.01	2.52	0.00	0.00	0.01	0.00	0.00	0.01	9.27	8.77	0.60	0.00	8.96	9.61	26.97	0.00	0.66	0.05
81.48	0.04	1.35	0.06	0.00	0.00	0.00	0.00	0.00	0.12	3.27	0.26	0.00	11.95	0.54	0.43	0.20	0.00	0.31
60.12	0.06	2.56	0.00	0.00	0.00	0.00	0.00	0.15	2.99	18.85	2.36	0.00	8.64	1.90	0.00	0.00	0.00	2.36
49.35	0.05	0.17	0.00	0.02	0.00	0.00	0.00	1.36	0.57	31.86	0.00	0.00	11.88	0.30	3.83	0.62	0.00	0.00
38.56	0.35	0.63	1.16	0.00	0.00	0.00	0.00	0.00	9.16	30.39	0.00	0.01	8.28	0.55	10.71	0.13	0.00	0.07
77.77	0.21	0.89	0.11	0.00	0.00	0.00	0.00	0.36	0.59	0.01	0.00	0.00	13.59	0.04	6.12	0.33	0.00	0.00
47.57	0.00	3.21	0.00	0.00	0.00	0.00	0.00	0.00	1.13	26.10	0.11	0.00	7.87	4.71	7.95	0.15	1.19	0.00
77.60	0.00	2.09	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.59	0.02	0.00	15.50	2.48	1.11	0.06	0.03	0.18
48.64	0.19	1.09	0.12	0.00	0.00	0.00	0.00	0.00	23.59	9.43	0.23	0.00	14.52	0.46	0.59	0.64	0.00	0.50
16.87	0.18	0.09	0.00	0.00	0.47	0.00	0.00	4.48	16.29	25.44	4.15	0.05	14.95	2.44	14.42	0.00	0.00	0.18

55.16	0.82	0.00	5.45	0.00	0.00	0.00	0.00	0.09	9.35	4.39	0.00	0.00	12.35	2.25	10.13	0.00	0.00	0.02
37.34	0.17	0.19	0.44	0.00	0.00	0.00	0.00	0.00	32.21	14.54	2.55	0.00	11.43	0.15	0.00	0.91	0.00	0.08
78.72	0.00	2.38	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.97	8.44	0.36	8.61	0.00	0.02	0.32	0.00	0.18
47.27	0.10	0.07	0.00	0.00	0.00	0.00	0.00	0.00	14.60	23.56	0.00	0.01	11.04	0.11	0.38	2.76	0.09	0.00
57.32	0.19	1.13	0.02	0.00	0.00	0.00	0.00	0.07	1.45	25.67	0.06	0.00	9.85	1.93	1.01	0.04	0.00	1.25
51.88	0.95	0.00	12.01	0.00	0.00	0.00	0.00	0.14	14.02	2.00	0.00	0.00	11.57	0.52	6.01	0.83	0.00	0.08
46.72	0.07	0.72	0.15	0.00	0.00	0.00	0.00	0.42	4.75	26.12	0.03	0.00	11.95	2.57	5.01	1.10	0.39	0.00
26.10	0.88	0.21	5.42	0.00	0.00	0.00	0.00	0.24	37.59	8.28	0.18	0.15	10.46	4.91	2.87	0.00	0.01	2.70
69.87	0.04	2.01	0.00	0.00	0.10	0.00	0.00	0.00	0.01	17.70	0.01	0.02	6.74	1.10	0.76	0.05	0.00	1.61
57.49	0.01	1.37	0.00	0.00	0.00	0.00	0.00	0.28	0.00	15.85	0.14	0.00	7.03	2.89	0.03	0.01	0.00	14.88
81.79	0.00	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.07	0.00	15.09	0.34	0.04	0.68	0.00	0.06
22.95	0.72	0.02	5.15	0.00	0.00	0.00	0.00	0.00	16.13	38.67	0.00	0.00	9.99	0.97	5.06	0.20	0.00	0.15
61.29	0.01	0.53	0.33	0.00	0.00	0.00	0.00	0.01	0.00	16.25	5.87	0.27	6.84	1.93	0.00	0.00	0.00	6.67
69.04	0.07	1.37	0.01	0.00	0.00	0.00	0.00	0.02	8.29	1.67	0.16	0.02	17.06	0.14	0.54	1.49	0.11	0.00
13.74	0.07	0.68	0.08	0.00	0.00	0.00	0.00	0.00	27.42	41.44	0.00	0.01	6.23	3.64	0.54	0.13	0.21	5.81
87.34	0.02	0.52	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.01	0.00	11.13	0.00	0.37	0.40	0.00	0.00
3.43	0.00	2.12	0.00	0.00	1.54	0.00	0.00	0.41	22.26	32.41	0.01	0.00	8.32	4.83	0.00	0.48	1.22	22.98
83.68	0.08	1.00	0.00	0.00	0.20	0.00	0.00	0.00	0.99	0.00	1.63	0.02	11.84	0.00	0.00	0.56	0.00	0.00
21.15	0.03	0.47	0.02	0.00	0.00	0.00	0.00	0.00	20.55	35.22	3.48	0.00	13.30	4.31	0.18	0.03	0.42	0.84
26.92	0.01	0.71	0.00	0.00	0.00	0.00	0.00	0.06	31.23	23.18	0.94	0.02	11.16	0.23	0.00	4.38	1.15	0.00
82.60	0.05	0.43	0.00	0.00	0.12	0.00	0.00	0.89	0.17	0.00	4.50	0.02	10.98	0.00	0.00	0.24	0.00	0.00
12.37	0.26	0.17	0.32	0.00	0.00	0.00	0.00	0.00	27.96	44.90	0.00	0.01	8.51	1.12	0.18	0.82	0.00	3.38
13.68	0.18	0.20	0.34	0.00	0.00	0.00	0.00	0.00	18.74	18.19	0.14	0.01	9.28	7.28	0.00	0.00	0.32	31.64
7.97	1.00	0.19	9.97	0.00	0.00	0.00	0.00	0.00	21.73	37.44	0.00	0.00	8.51	2.41	0.07	0.13	0.00	10.58
66.92	0.00	5.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.03	0.15	0.02	9.32	1.75	0.51	0.90	0.81	0.14
57.17	0.00	1.09	0.00	0.00	0.00	0.00	0.00	0.39	0.00	22.74	0.01	0.00	8.47	1.46	0.00	0.36	0.03	8.29
76.05	0.10	2.42	0.01	0.00	0.00	0.00	0.00	0.00	0.00	6.07	0.00	0.02	11.75	1.15	1.60	0.12	0.00	0.70
9.90	0.00	2.22	0.00	0.00	0.38	0.00	0.00	0.08	19.06	22.45	0.46	0.00	9.25	8.44	26.88	0.00	0.53	0.36
64.37	0.30	0.30	0.19	0.01	0.01	0.00	0.00	0.02	11.60	0.69	0.00	0.01	16.24	0.66	5.56	0.05	0.00	0.00

43.35	0.75	0.00	5.69	0.00	0.00	0.00	0.00	0.00	22.30	10.64	0.00	0.00	12.62	0.18	2.51	1.86	0.06	0.05
32.21	0.24	0.34	0.11	0.00	0.05	0.00	0.00	0.00	16.03	34.06	2.94	0.28	10.92	1.12	0.05	0.03	0.00	1.62
81.54	0.01	1.87	0.06	0.00	0.00	0.00	0.00	0.06	0.00	0.73	5.34	0.29	6.77	0.79	0.03	0.00	0.00	2.50
78.29	0.01	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.08	0.04	0.01	17.65	0.02	0.20	2.41	0.02	0.00
22.92	0.21	0.05	2.94	0.00	0.00	0.00	0.00	0.00	14.30	41.28	2.82	0.01	5.63	4.19	2.74	0.18	2.58	0.16
49.95	0.24	0.63	0.05	0.00	0.17	0.00	0.00	0.89	0.12	7.80	0.34	0.07	5.61	3.16	0.00	0.00	0.00	30.96
51.24	0.17	1.16	0.06	0.00	0.00	0.00	0.00	0.00	3.05	22.94	0.00	0.00	15.87	2.22	2.30	0.23	0.03	0.73
60.85	0.00	2.33	0.00	0.00	0.00	0.00	0.00	0.00	0.05	28.95	0.39	0.00	5.38	1.23	0.21	0.14	0.04	0.43
59.20	0.09	0.87	0.00	0.00	0.00	0.00	0.00	0.00	18.60	4.87	2.23	0.00	13.63	0.03	0.00	0.46	0.00	0.03
76.16	0.06	0.80	0.19	0.00	0.00	0.00	0.00	0.03	0.19	1.44	0.11	0.00	15.57	1.87	2.09	0.96	0.55	0.00
66.13	0.16	0.71	0.15	0.00	0.00	0.00	0.00	0.00	6.06	4.67	0.02	0.00	15.21	1.47	0.10	0.23	0.00	5.10
43.77	0.03	0.91	0.36	0.00	0.00	0.00	0.00	0.00	5.70	20.63	0.34	0.00	8.30	10.71	6.30	0.00	0.35	2.59
77.77	0.00	3.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.36	0.01	0.00	12.43	1.20	3.35	0.37	0.42	0.00
60.19	0.59	0.00	7.57	0.00	0.00	0.00	0.00	0.15	0.66	2.34	7.45	0.00	12.13	5.97	0.00	0.00	0.12	2.80
48.52	0.00	2.15	0.00	0.00	0.00	0.00	0.00	0.00	1.19	23.17	0.30	0.00	5.87	8.41	6.87	0.00	2.13	1.39
67.92	0.05	3.72	0.00	0.00	0.03	0.00	0.00	0.00	3.45	0.92	0.16	0.07	14.33	2.69	0.01	0.00	0.00	6.64
76.89	0.02	1.36	0.00	0.00	0.00	0.00	0.00	0.01	1.64	1.02	0.04	0.00	13.63	1.21	4.03	0.14	0.03	0.00
69.08	0.66	0.17	0.24	0.00	0.00	0.00	0.00	0.00	1.10	0.00	0.03	0.00	16.40	3.13	0.00	0.00	0.00	9.18
72.10	0.10	0.41	0.00	0.00	0.59	0.00	0.00	0.01	0.00	0.92	0.14	0.04	7.76	2.43	0.00	0.00	0.05	15.45
46.71	0.20	0.16	0.12	0.00	0.08	0.00	0.00	3.21	0.15	17.91	0.03	0.00	12.02	3.70	0.19	0.00	0.01	15.51
67.01	0.17	2.39	0.09	0.00	0.00	0.00	0.00	0.00	8.39	2.96	0.04	0.00	13.25	0.66	4.67	0.24	0.00	0.13
40.90	0.08	0.96	0.00	0.00	0.00	0.00	0.00	0.00	12.11	32.32	0.00	0.06	7.69	0.00	1.75	4.13	0.00	0.00
64.08	0.20	0.05	0.08	0.00	0.00	0.00	0.00	0.67	6.38	10.67	0.72	0.01	15.82	0.62	0.22	0.50	0.00	0.00
30.60	0.59	0.00	4.83	0.00	0.05	0.00	0.00	0.00	12.65	33.84	0.00	0.00	14.30	1.05	1.56	0.23	0.00	0.30
44.95	0.29	0.62	0.49	0.00	0.00	0.00	0.00	0.00	0.95	10.46	0.95	0.08	10.29	7.21	0.00	0.00	0.00	23.72
82.69	0.07	1.29	0.08	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.00	0.00	12.13	0.12	3.29	0.29	0.00	0.00
76.36	0.12	0.72	0.06	0.00	0.01	0.00	0.00	0.00	1.13	0.00	0.08	0.00	19.51	0.78	0.76	0.40	0.07	0.00
82.59	0.14	0.49	0.04	0.00	0.45	0.00	0.00	0.00	0.41	2.16	0.23	0.03	8.07	2.55	0.02	0.00	0.00	2.81
40.60	0.00	1.19	0.22	0.00	0.00	0.00	0.00	0.01	2.77	26.39	11.97	0.00	5.82	6.29	0.00	0.00	0.74	4.00

27.95	0.38	0.57	0.98	0.00	0.00	0.00	0.00	0.00	12.63	30.26	1.58	0.00	12.05	4.22	0.00	0.00	0.00	9.39
78.27	0.29	0.58	0.44	0.00	0.00	0.00	0.00	0.20	0.48	1.68	0.00	0.02	12.88	0.06	4.50	0.61	0.00	0.00
48.71	0.00	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.87	27.66	0.05	0.01	7.85	2.90	0.00	0.00	0.00	10.33
43.18	0.00	1.42	0.16	0.00	0.23	0.00	0.00	0.00	1.77	18.06	2.48	0.02	11.14	8.06	0.05	0.00	1.09	12.32
69.51	0.08	0.24	0.04	0.00	0.00	0.00	0.00	0.66	1.27	1.83	0.00	0.00	17.97	0.63	6.81	0.97	0.00	0.00
0.90	0.82	0.33	0.02	0.00	0.00	0.00	0.00	7.16	59.79	12.41	0.51	0.02	12.37	2.13	0.89	0.00	0.00	2.65
0.68	0.00	1.07	0.12	0.00	0.01	0.00	0.00	0.00	10.95	57.77	1.38	0.00	1.45	10.84	0.32	0.00	3.91	11.51
44.27	0.56	0.08	5.51	0.00	0.00	0.00	0.00	0.00	0.10	6.48	0.36	0.08	8.89	4.56	0.00	0.00	0.00	29.11
50.06	0.21	1.00	0.86	0.00	0.05	0.00	0.00	0.29	9.59	15.32	0.93	0.04	11.03	2.45	2.48	0.43	0.20	5.09

Appendix 5: LOD Scores for $\delta^{13}C$ and $\delta^{15}N$

Gene Region	Linkage Group	Loc-us	# of Homozygous Trees for Reference Allele	# of Heterozygotes	# of Homozygous Trees for the Non-Reference Allele	Missing Data	# of Polymorphic Families	cM_cont	$\delta^{13}C$ LOD	$\delta^{15}N$ LOD
NODE_283392_length_63_cov_2.000000	1	0	0	39	125	18	5	0	0.22	0.91
NODE_78269_length_74_cov_1.351351	1	1.13	0	20	148	14	5	1.13	0.15	0.01
NODE_196482_length_63_cov_2.603175	1	2.25	0	36	41	105	5	2.25	0.09	0.56
NODE_586903_length_63_cov_2.000000	1	3.22	83	20	0	79	5	3.22	0.06	0.03
NODE_324247_length_37_cov_1.135135	1	4.84	8	63	66	45	5	4.84	0.49	0.57
NODE_222490_length_66_cov_2.409091	1	5.64	0	15	44	123	5	5.64	0.91	0.24
NODE_720805_length_94_cov_1.074468	1	6.45	35	39	2	106	5	6.45	0.42	0.04
NODE_548110_length_63_cov_4.126984	1	7.4	0	9	13	160	2	7.4	0.01	0.07
NODE_337589_length_63_cov_3.809524	1	8.07	47	21	0	114	5	8.07	0.02	0.01
NODE_203000_length_63_cov_2.968254	1	9.68	32	15	0	135	5	9.68	0.24	0.08
NODE_247982_length_63_cov_2.000000	1	10.25	60	29	0	93	5	10.25	0.01	0.04
NODE_146565_length_63_cov_2.000000	1	11.28	110	9	0	63	5	11.28	0.09	0.34
NODE_73321_length_63_cov_2.873016	1	12.9	0	16	89	77	5	12.9	0.02	0.89
NODE_729905_length_63_cov_2.000000	1	14.52	0	25	77	80	5	14.52	0.01	0.25
NODE_291378_length_63_cov_4.984127	1	15.41	28	20	0	134	5	15.41	0.15	0.00

NODE_270969_length_63_cov_2.000000	1	16.36	96	17	0	69	5	16.36	0.02	0.00
NODE_434241_length_122_cov_2.377049	1	17.75	4	33	63	82	5	17.75	0.04	2.07
NODE_34490_length_63_cov_4.079365	1	19.36	43	20	0	119	5	19.36	1.01	0.54
NODE_433713_length_63_cov_2.000000	1	20.97	0	36	87	59	5	20.97	0.33	0.00
NODE_495535_length_63_cov_2.000000	1	22.58	0	33	36	113	5	22.58	1.75	0.01
NODE_365236_length_63_cov_2.365079	1	24.2	31	27	0	124	5	24.2	0.27	0.76
NODE_396304_length_63_cov_2.984127	1	25.81	0	8	151	23	5	25.81	1.65	0.02
NODE_374560_length_63_cov_2.031746	1	27.42	0	35	89	58	5	27.42	0.01	0.22
NODE_421137_length_63_cov_2.000000	1	29.02	0	25	57	100	5	29.02	0.02	0.02
NODE_318752_length_62_cov_2.854839	1	30.65	0	25	37	120	5	30.65	1.10	0.87
NODE_61280_length_63_cov_4.000000	1	31.66	0	7	108	67	3	31.66	0.39	0.02
NODE_437405_length_62_cov_2.000000	1	32.26	92	17	0	73	5	32.26	0.61	0.89
NODE_299936_length_63_cov_2.809524	1	33.64	37	17	0	128	4	33.64	0.28	0.72
NODE_44545_length_66_cov_1.060606	1	34.7	23	11	1	147	4	34.7	0.17	1.91
NODE_529811_length_63_cov_1.158730	1	36.55	48	10	0	124	4	36.55	0.08	0.00
NODE_365865_length_63_cov_2.666667	1	37.68	0	2	129	51	2	37.68	2.47	0.49
NODE_717016_length_63_cov_2.587301	1	38.71	0	11	118	53	5	38.71	0.65	0.10
NODE_265772_length_63_cov_3.000000	1	39.97	37	7	0	138	3	39.97	0.09	0.00
NODE_290953_length_63_cov_3.000000	1	41.93	26	14	0	142	3	41.93	0.29	0.77
NODE_383027_length_63_cov_3.126984	1	42.74	20	10	0	152	2	42.74	1.81	0.41
NODE_233082_length_63_cov_3.000000	1	43.56	0	19	24	139	5	43.56	0.00	0.07
NODE_74749_length_63_cov_3.238095	1	45.17	34	20	0	128	5	45.17	0.41	0.30
NODE_383746_length_62_cov_1.016129	1	46.78	34	10	0	138	5	46.78	0.07	0.29
NODE_596844_length_6	1	48.7	24	23	0	135	5	48.78	0.06	0.24

2_cov_1.000000		8								
NODE_384129_length_63_cov_2.000000	1	50.01	0	20	59	103	5	50.01	1.35	0.78
NODE_521756_length_63_cov_2.000000	1	51.62	0	9	102	71	5	51.62	0.56	0.04
NODE_200459_length_63_cov_3.000000	1	53.23	0	19	28	135	4	53.23	0.74	0.86
NODE_763962_length_63_cov_2.000000	1	54.85	0	9	50	123	5	54.85	1.07	0.01
NODE_269103_length_63_cov_2.222222	1	56.46	67	45	0	70	5	56.46	0.93	0.01
NODE_364341_length_63_cov_2.063492	1	57.38	40	29	0	113	5	57.38	0.17	0.08
NODE_500676_length_63_cov_2.000000	1	58.07	0	22	30	130	5	58.07	0.04	0.01
NODE_113640_length_63_cov_2.000000	1	59.38	0	26	62	94	5	59.38	0.25	0.02
NODE_204974_length_63_cov_3.523809	1	60.53	20	11	0	151	4	60.53	0.47	0.00
NODE_236704_length_63_cov_2.000000	1	61.67	0	8	32	142	3	61.67	0.55	0.01
NODE_583767_length_63_cov_3.000000	1	62.85	1	25	33	123	5	62.85	1.23	0.04
NODE_298251_length_63_cov_4.079365	1	64.34	0	24	28	130	4	64.34	0.05	0.00
NODE_300511_length_62_cov_2.000000	1	66.11	39	33	0	110	5	66.11	0.00	1.63
NODE_534373_length_63_cov_2.000000	1	67.38	5	40	49	88	5	67.38	0.23	0.28
NODE_218292_length_63_cov_2.920635	1	68.43	9	3	0	170	1	68.43	0.29	0.40
NODE_94150_length_64_cov_1.093750	1	69.65	56	35	4	87	5	69.65	0.16	0.27
NODE_287007_length_63_cov_2.000000	1	70.99	2	35	51	94	5	70.99	0.38	0.83
NODE_996_length_63_cov_2.000000	1	72.6	32	31	0	119	5	72.6	0.18	0.46
NODE_250577_length_63_cov_2.079365	1	74.22	30	24	0	128	5	74.22	0.19	0.08
NODE_196065_length_63_cov_3.000000	1	75.83	0	19	56	107	5	75.83	0.04	0.15
NODE_600348_length_63_cov_4.000000	1	77.44	72	49	0	61	5	77.44	0.04	0.08
NODE_670086_length_63_cov_2.000000	1	79.05	28	25	0	129	5	79.05	0.14	0.02
NODE_333515_length_62_cov_2.000000	1	82.22	42	22	0	118	5	82.22	0.53	1.55

NODE_383786_length_63_cov_2.000000	1	83.61	28	25	0	129	5	83.61	0.07	0.96
NODE_140146_length_63_cov_2.460317	1	85.51	0	27	32	123	5	85.51	0.04	2.10
NODE_140005_length_63_cov_2.111111	1	88.73	0	23	30	129	5	88.73	0.21	0.13
NODE_250508_length_63_cov_2.000000	1	89.27	49	30	0	103	5	89.27	0.40	0.53
NODE_124580_length_63_cov_2.000000	1	90.24	48	27	0	107	5	90.24	1.04	1.35
NODE_353563_length_63_cov_4.000000	1	92.5	0	17	26	139	4	92.5	0.10	0.79
NODE_492325_length_62_cov_2.000000	1	93.57	0	29	40	113	5	93.57	0.05	0.12
NODE_482340_length_63_cov_3.000000	1	94.79	80	42	0	60	5	94.79	0.04	0.08
NODE_583384_length_63_cov_2.000000	1	95.59	0	14	23	145	4	95.59	0.14	0.01
NODE_48080_length_63_cov_2.682540	1	96.8	7	44	38	93	5	96.8	0.29	0.18
NODE_90766_length_62_cov_2.000000	1	98.38	0	41	50	91	5	98.38	1.09	0.85
NODE_383340_length_63_cov_2.857143	1	99.1	0	14	20	148	4	99.1	0.11	0.37
NODE_22295_length_63_cov_4.317461	1	100.49	30	29	2	121	5	100.49	0.02	0.04
NODE_530635_length_63_cov_2.000000	1	101.64	48	36	1	97	5	101.64	0.01	0.09
NODE_121426_length_104_cov_1.182692	2	0	68	53	6	55	5	101.64	0.63	0.01
NODE_559648_length_63_cov_2.380952	2	1.64	0	27	32	123	5	103.28	1.20	0.62
NODE_656721_length_63_cov_1.174603	2	2.18	28	12	0	142	5	103.82	0.35	1.38
NODE_517815_length_63_cov_2.000000	2	3.27	25	23	0	134	5	104.91	0.56	1.81
NODE_112324_length_63_cov_2.000000	2	4.92	0	13	48	121	5	106.56	0.29	0.25
NODE_662962_length_63_cov_2.000000	2	5.46	0	12	65	105	5	107.1	0.54	0.83
NODE_474686_length_63_cov_2.000000	2	6.55	53	40	0	89	5	108.19	1.19	0.69
NODE_60143_length_63_cov_3.507936	2	8.56	0	55	73	54	5	110.2	0.63	0.27
NODE_640672_length_63_cov_2.000000	2	9.83	2	40	41	99	5	111.47	0.01	0.04
NODE_707460_length_6	2	11.4	37	28	2	115	5	113.1	0.02	0.94

3_cov_3.000000		6								
NODE_551471_length_62_cov_2.870968	2	13.16	2	54	39	87	5	114.74	0.02	0.01
NODE_344960_length_63_cov_3.888889	2	14.74	44	11	0	127	5	116.38	1.21	0.00
NODE_61819_length_63_cov_2.873016	2	16.38	0	19	40	123	4	118.02	0.89	0.04
NODE_729128_length_63_cov_3.000000	2	18.02	68	18	0	96	5	119.66	0.00	0.10
NODE_641153_length_63_cov_3.000000	2	18.56	0	15	23	144	4	120.2	0.11	0.02
NODE_333607_length_63_cov_2.063492	2	19.65	0	28	35	119	5	121.29	0.58	0.11
NODE_433108_length_63_cov_2.000000	2	21.29	1	43	85	53	5	122.93	0.09	0.07
NODE_277918_length_63_cov_3.000000	2	22.93	0	18	45	119	5	124.57	1.12	0.11
NODE_11300_length_63_cov_2.000000	2	24.57	0	29	55	98	5	126.21	1.13	0.00
NODE_661941_length_63_cov_2.000000	2	25.94	35	26	0	121	5	127.58	0.48	0.04
NODE_421142_length_63_cov_2.825397	2	26.51	0	12	68	102	5	128.15	1.81	0.01
NODE_472641_length_63_cov_2.000000	2	27.32	2	94	74	12	5	128.94	0.09	0.05
NODE_26268_length_63_cov_2.000000	2	29.48	33	25	1	123	5	131.12	0.04	0.00
NODE_285968_length_62_cov_2.000000	2	31.12	56	36	0	90	5	132.76	0.08	0.19
NODE_50826_length_63_cov_2.000000	2	32.75	41	40	0	101	5	134.39	0.02	0.30
NODE_9538_length_62_cov_2.000000	2	34.40	0	6	14	162	1	136.04	1.25	0.75
NODE_184056_length_63_cov_2.000000	2	34.94	0	8	47	127	5	136.58	0.04	0.27
NODE_713856_length_62_cov_1.000000	2	36.03	42	41	5	94	5	137.67	0.02	0.05
NODE_489814_length_63_cov_5.904762	2	37.67	55	24	0	103	5	139.31	0.01	0.53
NODE_733542_length_62_cov_2.532258	2	38.21	1	30	34	117	5	139.85	0.02	0.00
NODE_285214_length_63_cov_2.444444	2	39.31	2	46	53	81	5	140.95	0.25	0.35
NODE_199788_length_63_cov_2.380952	2	40.94	0	32	72	78	5	142.58	0.07	2.05
NODE_22085_length_37_cov_1.189189	2	41.49	153	25	0	4	4	143.13	0.11	0.14

NODE_491332_length_63_cov_2.619048	2	42.58	74	25	0	83	5	144.22	0.36	0.28
NODE_591589_length_63_cov_2.000000	2	43.67	0	7	48	127	4	145.31	0.54	0.26
NODE_180185_length_81_cov_1.074074	2	44.22	69	37	0	76	5	145.86	1.34	2.53
NODE_503295_length_63_cov_2.000000	2	45.75	84	12	0	86	5	147.39	0.00	0.07
NODE_178569_length_63_cov_3.238095	2	46.94	44	21	0	117	5	148.58	0.30	1.52
NODE_382529_length_63_cov_2.000000	2	47.5	0	29	70	83	5	149.14	0.01	0.27
NODE_111015_length_63_cov_2.333333	2	49.13	0	6	16	160	3	150.77	3.60	0.24
NODE_725758_length_63_cov_3.396825	2	51.85	0	25	31	126	2	153.49	3.63	0.05
NODE_470013_length_63_cov_2.000000	2	52.41	0	16	46	120	5	154.05	0.00	0.78
NODE_148386_length_63_cov_4.555555	2	54.04	0	29	81	72	5	155.68	0.00	0.30
NODE_185399_length_63_cov_2.000000	2	54.59	43	15	0	124	5	156.23	3.07	0.78
NODE_777691_length_63_cov_2.000000	2	55.68	84	28	0	70	5	157.32	0.25	0.23
NODE_209737_length_65_cov_1.200000	2	56.5	0	29	38	115	5	158.14	3.00	0.03
NODE_210481_length_63_cov_2.000000	2	57.32	65	37	0	80	5	158.96	0.37	0.07
NODE_391023_length_63_cov_2.000000	2	57.87	18	17	0	147	4	159.51	0.28	0.14
NODE_537981_length_63_cov_2.587301	2	58.48	117	33	0	32	5	160.12	0.24	1.55
NODE_563479_length_62_cov_2.000000	2	60.6	0	40	46	96	5	162.24	0.00	0.02
NODE_645931_length_63_cov_3.000000	2	63.33	0	17	19	146	3	164.97	0.08	0.51
NODE_59535_length_51_cov_2.509804	2	63.87	84	45	0	53	5	165.51	0.03	0.08
NODE_730618_length_63_cov_2.000000	2	65.51	1	37	52	92	5	167.15	0.01	0.52
NODE_358990_length_63_cov_1.825397	2	66.6	16	11	0	155	3	168.24	0.13	2.60
NODE_420703_length_63_cov_2.000000	2	67.7	0	9	11	162	3	169.34	0.95	0.01
NODE_453562_length_63_cov_2.000000	2	68.79	64	21	0	97	5	170.43	0.33	1.74
NODE_630702_length_6	2	70.4	0	13	68	101	4	172.06	0.18	1.13

3_cov_2.238095		2								
NODE_690209_length_63_cov_3.492064	2	71.38	19	14	0	149	5	173.02	0.00	1.20
NODE_700551_length_63_cov_2.317460	2	72.06	60	27	0	95	5	173.7	0.61	0.49
NODE_531234_length_63_cov_2.190476	2	73.7	0	20	25	137	5	175.34	0.13	0.12
NODE_452391_length_62_cov_2.000000	2	74.58	21	10	0	151	5	176.22	0.85	2.07
NODE_188089_length_62_cov_2.822581	2	75.33	0	32	38	112	5	176.97	0.74	1.00
NODE_77930_length_63_cov_2.000000	2	76.97	53	56	0	73	5	178.61	0.60	0.00
NODE_405175_length_63_cov_2.285714	2	78.61	35	18	0	129	5	180.25	0.00	0.02
NODE_93393_length_63_cov_3.460317	2	82.32	30	16	0	136	4	183.96	0.00	0.07
NODE_368983_length_63_cov_2.000000	2	83.53	67	17	0	98	5	185.17	0.63	1.02
NODE_54920_length_63_cov_4.000000	2	85.17	0	20	61	101	5	186.81	1.55	0.13
NODE_252033_length_63_cov_2.000000	2	86.8	39	22	0	121	5	188.44	0.62	0.02
NODE_366448_length_63_cov_2.000000	2	88.44	70	27	0	85	5	190.08	0.70	0.25
NODE_91141_length_63_cov_2.000000	3	0	0	41	46	95	5	190.08	0.01	0.26
NODE_423343_length_64_cov_1.218750	3	0.9	30	16	0	136	5	190.98	0.29	0.32
NODE_777642_length_63_cov_2.000000	3	1.79	51	40	3	88	5	191.87	0.02	0.01
NODE_166746_length_63_cov_2.000000	3	2.7	19	12	0	151	5	192.78	0.71	0.40
NODE_175590_length_63_cov_2.619048	3	3.29	0	30	35	117	5	193.37	0.00	0.01
NODE_196308_length_63_cov_2.777778	3	4.5	1	28	31	122	4	194.58	0.01	0.91
NODE_309089_length_63_cov_2.000000	3	5.41	0	33	46	103	5	195.49	0.05	0.00
NODE_218392_length_63_cov_2.000000	3	6.3	0	15	25	142	5	196.38	1.32	0.00
NODE_169561_length_63_cov_3.047619	3	6.88	0	26	41	115	5	196.96	0.36	0.04
NODE_563579_length_63_cov_2.000000	3	7.39	3	27	52	100	5	197.47	0.04	1.08
NODE_374549_length_63_cov_2.000000	3	8.14	0	18	20	144	5	198.22	0.12	0.00

NODE_194921_length_63_cov_2.634921	3	8.95	0	7	52	123	4	199.03	0.99	0.37
NODE_245678_length_63_cov_2.000000	3	9.79	0	25	49	108	5	199.87	0.16	0.74
NODE_203195_length_63_cov_3.746032	3	10.74	1	25	47	109	5	200.82	0.21	0.74
NODE_282504_length_63_cov_2.000000	3	11.71	0	29	37	116	5	201.79	0.11	0.01
NODE_504606_length_63_cov_2.285714	3	12.32	0	40	53	89	5	202.4	0.77	0.37
NODE_299914_length_63_cov_3.206349	3	13.34	1	33	31	117	5	203.42	0.07	0.78
NODE_160574_length_63_cov_2.000000	3	14.32	39	47	5	91	5	204.4	0.35	0.46
NODE_127095_length_63_cov_2.000000	3	15.13	0	15	53	114	5	205.21	1.50	0.05
NODE_162423_length_63_cov_3.317460	3	16.22	0	12	42	128	5	206.3	0.46	0.00
NODE_212302_length_63_cov_2.000000	3	17.12	0	24	47	111	5	207.2	0.23	0.94
NODE_214173_length_44_cov_1.000000	3	17.9	1	45	100	36	5	207.98	0.48	1.20
NODE_689597_length_62_cov_2.000000	3	18.93	98	54	0	30	5	209.01	0.11	1.18
NODE_536504_length_63_cov_2.000000	3	19.82	0	12	21	149	2	209.9	0.77	1.16
NODE_551793_length_62_cov_2.145161	3	21.36	0	25	55	102	5	211.44	1.45	0.00
NODE_48155_length_63_cov_2.000000	3	22.53	50	28	1	103	5	212.61	0.15	0.13
NODE_412766_length_63_cov_2.000000	3	23.28	0	27	43	112	5	213.36	1.43	0.49
NODE_616169_length_62_cov_1.000000	3	24.22	0	15	39	128	5	214.3	1.10	1.36
NODE_12062_length_63_cov_3.587301	3	25.81	0	23	42	117	5	215.89	0.05	0.49
NODE_660790_length_63_cov_2.000000	3	26.8	0	22	38	122	5	216.88	0.15	3.24
NODE_727439_length_63_cov_2.000000	3	27.59	0	14	43	125	5	217.67	1.19	0.03
NODE_493968_length_63_cov_2.634921	3	28.65	0	12	74	96	5	218.73	0.50	0.12
NODE_602602_length_63_cov_2.000000	3	30.43	0	18	109	55	5	220.51	0.46	4.63
NODE_346066_length_63_cov_2.095238	3	32.03	0	26	28	128	5	222.11	0.00	0.00
NODE_193880_length_6	3	34.0	116	42	0	24	5	224.1	1.10	0.07

3_cov_3.000000		2								
NODE_184412_length_97_cov_1.340206	3	35.21	0	16	26	140	5	225.29	1.83	0.47
NODE_580957_length_63_cov_2.000000	3	37.6	0	20	26	136	4	227.68	0.00	0.03
NODE_338174_length_43_cov_1.000000	3	39.16	103	67	0	12	5	229.24	0.01	0.65
NODE_531508_length_63_cov_3.000000	3	39.96	21	20	0	141	5	230.04	0.01	0.00
NODE_402080_length_63_cov_2.063492	3	41.82	36	33	0	113	5	231.9	0.34	0.80
NODE_625170_length_89_cov_2.359550	3	42.97	28	19	0	135	5	233.05	0.33	0.14
NODE_719937_length_63_cov_3.000000	3	43.59	5	4	0	173	0	233.67	0.02	0.12
NODE_153983_length_63_cov_2.000000	3	44.76	0	26	47	109	5	234.84	0.01	0.00
NODE_461666_length_63_cov_3.222222	3	46.55	0	25	33	124	3	236.63	0.04	0.23
NODE_376765_length_63_cov_2.000000	3	48.34	0	31	32	119	5	238.42	0.01	0.37
NODE_311331_length_62_cov_3.000000	3	50.13	0	22	77	83	5	240.21	0.52	0.10
NODE_556847_length_63_cov_2.476191	3	51.6	61	15	0	106	3	241.68	0.25	0.03
NODE_26475_length_62_cov_2.000000	3	53.71	74	34	0	74	5	243.79	0.02	1.48
NODE_255839_length_63_cov_2.000000	3	55.5	0	34	61	87	5	245.58	0.24	0.03
NODE_270209_length_62_cov_1.000000	3	57.3	95	13	0	74	5	247.38	1.08	0.05
NODE_728122_length_63_cov_2.936508	3	59.08	24	23	0	135	5	249.16	0.01	2.23
NODE_469545_length_63_cov_2.000000	3	60.88	3	30	48	101	5	250.96	0.00	0.10
NODE_206757_length_63_cov_2.000000	3	62.66	0	13	59	110	4	252.74	1.09	0.03
NODE_133303_length_63_cov_2.000000	3	63.96	0	57	96	29	5	254.04	0.48	1.67
NODE_145163_length_62_cov_2.741935	3	64.52	1	34	54	93	5	254.6	0.46	0.03
NODE_469717_length_62_cov_2.000000	3	65.21	20	10	0	152	4	255.29	0.00	0.04
NODE_259455_length_63_cov_1.190476	3	66.25	0	27	121	34	5	256.33	1.11	0.09
NODE_702149_length_63_cov_2.984127	3	68.04	5	72	59	46	5	258.12	2.55	0.33

NODE_14140_length_62_cov_2.967742	3	69.82	7	86	57	32	5	259.9	0.85	0.49
NODE_88511_length_63_cov_2.238095	3	70.41	0	19	72	91	5	260.49	1.48	0.13
NODE_71606_length_63_cov_2.428571	3	71.62	0	18	62	102	5	261.7	1.35	0.70
NODE_458295_length_63_cov_3.730159	3	72.97	28	24	0	130	5	263.05	0.79	0.03
NODE_471677_length_63_cov_2.000000	3	73.89	68	64	0	50	5	263.97	7.53	1.84
NODE_181847_length_36_cov_4.750000	3	75.42	127	14	0	41	5	265.5	2.34	1.37
NODE_235070_length_63_cov_2.000000	3	76.33	0	8	38	136	2	266.41	0.89	0.77
NODE_663069_length_63_cov_2.000000	3	77.22	34	30	0	118	5	267.3	1.14	0.26
NODE_155888_length_63_cov_3.000000	3	78.78	0	7	75	100	3	268.86	0.00	0.54
NODE_601327_length_63_cov_2.698413	3	80.57	0	32	59	91	5	270.65	0.47	0.31
NODE_519299_length_63_cov_2.000000	3	82.36	33	28	0	121	5	272.44	0.12	0.32
NODE_7984_length_63_cov_2.000000	3	83.29	29	27	0	126	4	273.37	0.33	0.19
NODE_298701_length_63_cov_2.587301	3	84.15	36	23	0	123	4	274.23	0.24	0.07
NODE_413883_length_66_cov_1.651515	3	85.94	120	12	0	50	5	276.02	0.59	0.01
NODE_689911_length_63_cov_3.682540	3	87.73	0	19	33	130	4	277.81	0.92	1.24
NODE_295702_length_63_cov_2.682540	3	89.52	0	17	74	91	5	279.6	0.01	0.01
NODE_521381_length_78_cov_1.025641	3	91.31	64	58	3	57	5	281.39	0.05	0.98
NODE_613549_length_63_cov_2.000000	3	92.5	56	9	0	117	4	282.58	0.03	0.92
NODE_388808_length_31_cov_1.129032	3	93.1	15	121	45	1	5	283.18	0.27	0.01
NODE_702092_length_63_cov_3.000000	4	0	0	53	125	4	5	283.18	0.58	0.07
NODE_42486_length_63_cov_3.539683	4	1.28	46	10	0	126	5	284.46	0.43	1.69
NODE_659307_length_63_cov_2.000000	4	2.8	30	12	0	140	5	285.98	1.49	0.34
NODE_190127_length_62_cov_2.000000	4	4.37	37	27	0	118	5	287.55	0.54	0.10
NODE_426212_length_6	4	5.83	0	19	69	94	5	289.01	0.07	0.02

3_cov_2.984127										
NODE_765265_length_63_cov_2.730159	4	6.44	0	31	150	1	5	289.62	0.00	0.92
NODE_776386_length_63_cov_2.603175	4	7.29	0	19	37	126	5	290.47	0.23	0.69
NODE_17206_length_63_cov_2.063492	4	10.23	0	16	21	145	4	293.41	0.00	0.23
NODE_241955_length_62_cov_1.000000	4	11.67	0	23	37	122	5	294.85	0.31	0.02
NODE_251606_length_63_cov_2.634921	4	14.58	0	18	34	130	5	297.76	1.19	0.03
NODE_209069_length_63_cov_2.380952	4	16.04	0	12	22	148	4	299.22	2.07	0.05
NODE_478283_length_63_cov_2.000000	4	17.96	15	13	0	154	4	301.14	2.51	0.15
NODE_325890_length_75_cov_1.520000	4	18.95	127	22	0	33	5	302.13	2.18	0.02
NODE_711641_length_62_cov_2.000000	4	20.41	74	13	0	95	5	303.59	0.56	0.14
NODE_45888_length_62_cov_2.000000	4	21.87	20	24	1	137	4	305.05	0.13	6.29
NODE_331878_length_80_cov_1.212500	4	23.32	165	10	0	7	5	306.5	0.41	1.38
NODE_383731_length_63_cov_2.539683	4	24.78	1	23	34	124	5	307.96	0.58	0.07
NODE_750619_length_63_cov_2.000000	4	26.24	0	15	18	149	5	309.42	1.87	0.03
NODE_644159_length_63_cov_2.158730	4	27.75	0	22	51	109	5	310.93	0.31	0.54
NODE_766869_length_63_cov_2.000000	4	29.61	17	12	0	153	5	312.79	0.97	0.62
NODE_721231_length_63_cov_2.000000	4	30.65	60	17	0	105	4	313.83	0.01	0.22
NODE_549469_length_63_cov_2.000000	4	32.08	0	8	77	97	4	315.26	0.06	0.01
NODE_494829_length_63_cov_2.000000	4	33.47	0	11	12	159	4	316.65	0.06	0.00
NODE_276844_length_63_cov_3.000000	4	35	0	21	26	135	5	318.18	0.48	0.36
NODE_467957_length_69_cov_1.130435	4	36.45	0	58	111	13	5	319.63	1.42	0.02
NODE_643734_length_62_cov_2.000000	4	37.89	44	12	0	126	5	321.07	0.03	0.27
NODE_298469_length_62_cov_2.000000	4	39.37	34	22	0	126	5	322.55	0.82	0.01
NODE_74703_length_104_cov_1.413462	4	40.24	127	42	0	13	5	323.42	3.84	0.03

NODE_199817_length_74_cov_1.567568	4	40.83	15	11	0	156	5	324.01	0.59	0.09
NODE_70339_length_65_cov_1.353846	4	41.35	0	6	13	163	1	324.53	0.02	0.02
NODE_284402_length_63_cov_2.000000	4	42.28	103	9	0	70	5	325.46	0.10	0.20
NODE_264979_length_63_cov_3.000000	4	43.74	0	43	49	90	5	326.92	0.01	0.02
NODE_765788_length_63_cov_2.952381	4	45.2	58	25	0	99	3	328.38	0.73	0.03
NODE_67807_length_69_cov_3.289855	4	45.7	0	23	30	129	5	328.88	0.20	0.10
NODE_164432_length_63_cov_2.000000	4	46.66	27	16	0	139	4	329.84	0.16	0.83
NODE_681131_length_63_cov_2.000000	4	48.12	42	28	0	112	5	331.3	0.12	0.22
NODE_208771_length_63_cov_2.476191	4	49.57	0	34	72	76	5	332.75	0.02	0.01
NODE_595339_length_63_cov_2.000000	4	50.92	3	14	19	146	5	334.1	0.14	0.01
NODE_205647_length_63_cov_5.000000	4	52.49	86	76	0	20	5	335.67	0.38	0.03
NODE_463362_length_63_cov_2.000000	4	53.95	0	22	41	119	5	337.13	0.12	0.01
NODE_537971_length_63_cov_2.587301	4	55.41	0	18	58	106	5	338.59	0.34	0.20
NODE_671351_length_63_cov_2.000000	4	57.74	52	7	0	123	3	340.92	0.05	0.31
NODE_164232_length_63_cov_3.095238	4	58.32	0	19	46	117	5	341.5	0.15	0.08
NODE_749883_length_63_cov_2.000000	4	59.88	9	5	0	168	1	343.06	0.21	0.11
NODE_766669_length_63_cov_3.000000	4	61.24	28	19	0	135	5	344.42	1.23	0.00
NODE_458684_length_63_cov_2.000000	4	62.69	0	15	72	95	5	345.87	0.70	0.10
NODE_25921_length_63_cov_3.190476	4	64.15	0	25	49	108	5	347.33	0.05	0.37
NODE_305456_length_63_cov_2.301587	4	66.41	27	22	0	133	5	349.59	0.15	0.20
NODE_500142_length_63_cov_1.809524	4	68.53	0	12	100	70	3	351.71	0.11	0.00
NODE_103886_length_62_cov_2.596774	4	69.99	34	24	0	124	5	353.17	0.09	0.77
NODE_464148_length_63_cov_2.000000	4	72.9	0	16	35	131	4	356.08	0.21	2.84
NODE_51716_length_63	4	74.3	0	15	56	111	5	357.54	0.06	0.52

_cov_3.428571		6								
NODE_111318_length_63_cov_1.730159	4	75.81	0	16	117	49	4	358.99	0.01	0.13
NODE_312028_length_63_cov_2.000000	4	77.4	24	17	0	141	5	360.58	2.65	0.09
NODE_573774_length_63_cov_2.000000	4	78.8	0	4	16	162	1	361.98	0.20	1.23
NODE_305443_length_63_cov_2.539683	4	81.65	58	16	0	108	5	364.83	0.34	0.91
NODE_702080_length_62_cov_2.000000	4	83.11	0	32	33	117	5	366.29	0.35	0.49
NODE_228344_length_63_cov_2.714286	4	84.57	55	17	0	110	4	367.75	0.22	0.13
NODE_772386_length_62_cov_2.000000	4	86.02	0	9	22	151	2	369.2	0.07	0.05
NODE_765390_length_63_cov_2.841270	4	87.75	27	22	0	133	5	370.93	0.04	0.06
NODE_97403_length_62_cov_2.000000	4	88.94	78	25	0	79	5	372.12	1.10	0.13
NODE_182670_length_78_cov_2.333333	4	90.4	0	34	41	107	5	373.58	0.22	0.00
NODE_512379_length_74_cov_2.621622	4	91.86	154	26	0	2	5	375.04	0.00	0.28
NODE_205076_length_63_cov_2.000000	4	93.2	117	10	0	55	4	376.38	0.05	0.00
NODE_168098_length_63_cov_2.000000	4	94.66	97	41	0	44	5	377.84	0.28	0.33
NODE_395934_length_63_cov_2.000000	4	96.23	80	13	0	89	5	379.41	0.10	0.01
NODE_585028_length_63_cov_2.000000	5	0	0	10	127	45	4	379.41	1.13	0.18
NODE_206363_length_63_cov_2.412699	5	1.37	47	25	0	110	5	380.78	1.45	0.00
NODE_504072_length_62_cov_2.000000	5	2.04	72	12	0	98	5	381.45	0.14	0.09
NODE_494407_length_63_cov_2.000000	5	4.02	0	18	27	137	5	383.43	0.95	0.11
NODE_239279_length_63_cov_2.000000	5	5.18	0	25	77	80	5	384.59	0.07	0.01
NODE_263216_length_63_cov_2.000000	5	6.71	70	14	0	98	5	386.12	0.05	0.08
NODE_595920_length_63_cov_2.000000	5	8.05	75	11	0	96	5	387.46	0.01	0.60
NODE_669893_length_63_cov_2.253968	5	9.39	0	43	116	23	5	388.8	0.20	1.43
NODE_777580_length_63_cov_2.000000	5	10.73	56	37	0	89	5	390.14	0.07	0.58

NODE_135142_length_63_cov_5.095238	5	12.07	0	21	52	109	5	391.48	0.02	0.12
NODE_328524_length_63_cov_2.031746	5	13.41	17	10	0	155	4	392.82	3.66	0.06
NODE_350508_length_63_cov_1.904762	5	14.09	0	31	101	50	5	393.5	0.18	0.01
NODE_388299_length_63_cov_2.333333	5	14.76	0	50	66	66	5	394.17	0.05	0.47
NODE_416510_length_62_cov_2.000000	5	16.10	0	12	36	134	5	395.51	0.06	0.01
NODE_252614_length_63_cov_4.634921	5	17.44	31	20	0	131	5	396.85	0.62	0.04
NODE_65047_length_99_cov_1.222222	5	20.05	0	10	73	99	4	399.46	0.07	0.03
NODE_663707_length_31_cov_1.000000	5	21.47	0	33	148	1	5	400.88	2.42	0.11
NODE_585094_length_62_cov_2.387097	5	22.82	0	23	31	128	5	402.23	0.21	0.04
NODE_777285_length_63_cov_3.000000	5	24.16	55	27	0	100	5	403.57	0.26	0.14
NODE_733670_length_63_cov_2.190476	5	25.52	29	28	0	125	5	404.91	0.02	0.22
NODE_730262_length_63_cov_2.000000	5	27.19	0	7	14	161	2	406.6	0.78	0.19
NODE_297531_length_63_cov_3.000000	5	28.18	0	12	32	138	2	407.59	0.18	0.10
NODE_75175_length_63_cov_2.333333	5	29.52	67	10	0	105	5	408.93	0.36	0.98
NODE_180968_length_63_cov_2.000000	5	30.87	19	4	0	159	2	410.28	0.41	0.23
NODE_500193_length_63_cov_3.222222	5	32.21	0	38	46	98	5	411.62	0.01	0.66
NODE_232280_length_63_cov_2.000000	5	33.55	50	12	0	120	5	412.96	0.28	0.25
NODE_401696_length_63_cov_2.888889	5	34.22	0	33	89	60	5	413.63	0.00	0.82
NODE_128404_length_101_cov_2.574257	5	34.89	110	10	0	62	5	414.3	0.01	0.39
NODE_596103_length_63_cov_2.000000	5	37.57	0	10	45	127	4	416.98	0.71	0.54
NODE_71626_length_64_cov_2.890625	5	38.91	0	4	27	151	4	418.32	1.11	0.11
NODE_86955_length_81_cov_1.148148	5	40.26	0	8	20	154	3	419.67	0.91	1.43
NODE_599065_length_63_cov_2.428571	5	41.6	0	14	55	113	5	421.01	1.52	0.01
NODE_568779_length_6	5	42.9	38	28	1	115	5	422.35	0.28	0.16

3_cov_2.460317		4								
NODE_222952_length_63_cov_3.317460	5	44.28	0	18	39	125	4	423.69	0.36	0.57
NODE_222217_length_63_cov_2.000000	5	45.62	0	14	39	129	5	425.03	0.03	0.02
NODE_57837_length_110_cov_2.554545	5	46.96	0	45	84	53	5	426.37	0.05	0.12
NODE_357236_length_63_cov_3.634921	5	48.31	138	10	0	34	5	427.72	1.08	0.04
NODE_680172_length_63_cov_2.000000	5	49.65	0	18	37	127	5	429.06	0.85	0.00
NODE_563168_length_63_cov_2.079365	5	51	0	16	43	123	5	430.41	0.11	0.42
NODE_337592_length_63_cov_2.984127	5	52.33	0	16	76	90	5	431.74	0.13	0.27
NODE_70738_length_63_cov_3.000000	5	53.67	14	8	0	160	3	433.08	0.03	0.00
NODE_492407_length_63_cov_2.301587	5	55.02	0	13	82	87	5	434.43	0.47	1.63
NODE_345308_length_63_cov_2.777778	5	56.36	101	19	0	62	5	435.77	0.06	0.12
NODE_9483_length_63_cov_2.619048	5	57.7	0	47	115	20	4	437.11	0.22	0.86
NODE_69381_length_63_cov_2.000000	5	59.17	0	39	50	93	5	438.58	0.20	0.36
NODE_74428_length_63_cov_2.000000	5	60.39	0	13	17	152	4	439.8	0.05	0.01
NODE_235354_length_63_cov_2.000000	5	61.73	0	21	41	120	5	441.14	0.13	0.02
NODE_719401_length_63_cov_2.000000	5	63.07	0	7	50	125	5	442.48	0.06	0.03
NODE_76395_length_62_cov_1.000000	5	64.41	21	19	0	142	5	443.82	1.23	1.28
NODE_474122_length_63_cov_2.793651	5	67.76	39	34	0	109	5	447.17	0.06	0.82
NODE_548218_length_63_cov_2.730159	5	68.43	0	16	44	122	4	447.84	0.02	0.24
NODE_208913_length_63_cov_2.603175	5	69.78	0	26	23	133	5	449.19	0.00	0.00
NODE_248999_length_102_cov_2.303921	5	71.12	53	20	0	109	5	450.53	0.00	0.05
NODE_605278_length_63_cov_2.000000	5	72.46	94	48	0	40	5	451.87	0.01	1.11
NODE_73888_length_63_cov_2.000000	5	73.8	0	24	29	129	5	453.21	0.05	0.07
NODE_241624_length_62_cov_2.854839	5	75.14	45	27	0	110	5	454.55	1.63	0.40

NODE_731758_length_63_cov_3.000000	5	76.48	4	31	35	112	5	455.89	0.30	3.20
NODE_757605_length_63_cov_2.000000	5	77.83	0	32	39	111	5	457.24	0.12	0.04
NODE_711104_length_63_cov_2.444444	5	79.17	9	8	0	165	1	458.58	0.05	0.44
NODE_731663_length_63_cov_2.507936	5	80.51	0	27	51	104	5	459.92	0.76	0.00
NODE_338246_length_63_cov_2.000000	5	81.85	0	36	44	102	4	461.26	0.73	0.22
NODE_28033_length_115_cov_5.121739	5	83.23	3	30	119	30	5	462.61	0.28	0.79
NODE_287432_length_63_cov_2.063492	5	84.54	0	22	127	33	5	463.95	0.01	0.98
NODE_313294_length_63_cov_2.000000	5	85.88	0	13	45	124	4	465.29	0.02	1.66
NODE_693285_length_63_cov_2.571429	5	87.22	47	36	0	99	5	466.63	0.48	0.08
NODE_121623_length_62_cov_2.322581	5	88.56	0	36	42	104	5	467.97	0.00	0.91
NODE_128098_length_62_cov_1.870968	5	90.13	0	19	103	60	5	469.54	0.16	0.31
NODE_615274_length_63_cov_2.507936	5	91.47	30	29	0	123	5	470.88	1.47	0.00
NODE_92736_length_63_cov_2.825397	5	92.59	26	15	0	141	4	472	0.59	0.03
NODE_157132_length_63_cov_3.269841	5	94.61	18	17	0	147	5	474.01	0.15	0.37
NODE_529897_length_62_cov_1.532258	5	95.27	0	4	15	163	3	474.68	0.23	0.21
NODE_452547_length_62_cov_1.935484	5	96.99	15	10	0	157	2	476.4	0.02	1.18
NODE_280213_length_63_cov_2.984127	5	98.27	0	15	14	153	3	477.68	6.80	0.03
NODE_312382_length_62_cov_2.306452	5	99.31	38	41	2	101	5	478.71	0.06	0.09
NODE_153820_length_62_cov_2.983871	5	100.94	79	41	0	62	5	480.35	0.42	0.86
NODE_29706_length_69_cov_1.637681	5	101.61	8	75	61	38	5	481.02	0.13	0.29
NODE_65463_length_63_cov_2.238095	5	103.32	0	15	149	18	5	482.73	0.02	0.12
NODE_655409_length_63_cov_2.365079	5	104.67	0	24	64	94	5	484.08	0.15	0.01
NODE_679803_length_63_cov_2.000000	5	106.01	0	21	24	137	5	485.42	0.00	0.00
NODE_593128_length_6	5	107.	8	47	52	75	5	486.76	0.87	0.16

3_cov_2.380952		35								
NODE_15565_length_63_cov_3.873016	6	0	1	69	107	5	5	486.76	0.30	0.43
NODE_80795_length_63_cov_2.000000	6	1.08	23	16	0	143	4	487.84	0.07	0.05
NODE_420133_length_63_cov_2.952381	6	1.73	0	16	56	110	5	488.49	1.45	0.03
NODE_141719_length_63_cov_2.682540	6	2.35	95	14	0	73	4	489.11	0.05	0.26
NODE_537859_length_63_cov_1.095238	6	3.47	73	31	0	78	5	490.23	0.01	0.01
NODE_516946_length_63_cov_2.000000	6	4.3	0	13	25	144	3	491.06	0.32	0.01
NODE_107883_length_63_cov_2.000000	6	5.23	36	28	0	118	5	491.99	0.13	0.00
NODE_323730_length_32_cov_2.000000	6	6.46	147	32	0	3	5	493.22	0.10	1.30
NODE_755470_length_63_cov_3.619048	6	7.53	31	12	0	139	3	494.29	0.00	0.06
NODE_645275_length_63_cov_2.126984	6	8.67	39	36	4	103	5	495.43	1.32	0.36
NODE_141501_length_41_cov_1.048780	6	9.75	83	49	0	50	5	496.51	0.01	0.21
NODE_457967_length_63_cov_2.000000	6	10.4	0	16	75	91	5	497.16	1.32	0.86
NODE_109275_length_63_cov_2.634921	6	11.84	0	23	29	130	5	498.6	0.43	0.04
NODE_633272_length_63_cov_2.190476	6	12.43	0	23	45	114	5	499.19	0.36	0.72
NODE_126951_length_63_cov_2.000000	6	13.65	0	32	41	109	5	500.41	0.02	0.07
NODE_36608_length_63_cov_2.492064	6	14.3	0	31	52	99	5	501.06	0.02	0.00
NODE_471541_length_62_cov_2.370968	6	15.4	0	8	30	144	5	502.16	1.44	0.03
NODE_250120_length_62_cov_1.370968	6	16.15	73	23	0	86	4	502.91	0.44	0.44
NODE_285787_length_63_cov_1.126984	6	17.46	1	43	62	76	5	504.22	0.01	0.00
NODE_58221_length_63_cov_2.682540	6	18.3	0	23	93	66	5	505.06	0.60	0.10
NODE_379673_length_63_cov_3.000000	6	19.22	82	8	0	92	4	505.98	0.62	2.57
NODE_373286_length_63_cov_3.000000	6	20.96	0	23	27	132	5	507.72	0.20	0.00
NODE_469892_length_63_cov_2.000000	6	21.53	1	32	43	106	5	508.29	0.19	0.16

NODE_505068_length_63_cov_2.000000	6	22.45	39	22	1	120	5	509.21	0.11	0.01
NODE_74692_length_63_cov_1.841270	6	23.69	1	41	66	74	5	510.45	0.77	0.14
NODE_372874_length_63_cov_2.841270	6	24.36	56	21	0	105	5	511.12	0.05	0.03
NODE_104283_length_63_cov_3.936508	6	25.59	46	15	0	121	5	512.35	0.00	0.02
NODE_383390_length_63_cov_2.000000	6	26.21	0	12	65	105	5	512.97	2.94	0.93
NODE_625652_length_35_cov_3.000000	6	27.3	0	37	99	46	5	514.06	0.01	0.70
NODE_615858_length_63_cov_2.571429	6	28.48	0	13	35	134	5	515.24	0.64	0.00
NODE_613916_length_62_cov_2.919355	6	29.35	0	14	71	97	4	516.11	0.13	0.00
NODE_228876_length_63_cov_2.000000	6	30.71	26	15	0	141	3	517.47	0.26	0.48
NODE_473885_length_62_cov_2.000000	6	31.44	86	24	0	72	5	518.2	1.37	0.57
NODE_234747_length_57_cov_2.438596	6	32.8	0	26	56	100	5	519.56	0.11	0.52
NODE_14521_length_37_cov_1.216216	6	33.49	116	59	0	7	5	520.25	0.85	2.37
NODE_149136_length_31_cov_1.870968	6	34.62	106	74	0	2	5	521.38	1.29	0.09
NODE_47447_length_63_cov_3.904762	6	35.53	0	15	36	131	5	522.29	0.39	1.27
NODE_184215_length_62_cov_1.000000	6	36.61	0	8	66	108	5	523.37	3.18	0.29
NODE_221815_length_63_cov_2.000000	6	37.54	0	7	9	166	2	524.3	0.65	0.19
NODE_70336_length_112_cov_1.125000	6	38.43	0	22	37	123	5	525.19	0.48	0.04
NODE_751946_length_63_cov_2.000000	6	39.24	0	20	27	135	4	526	0.03	0.32
NODE_630880_length_35_cov_1.000000	6	39.86	0	135	47	0	5	526.62	3.56	1.54
NODE_712971_length_32_cov_1.125000	6	40.91	4	55	56	67	5	527.67	1.60	0.28
NODE_581524_length_63_cov_2.000000	6	41.93	3	50	61	68	5	528.69	0.04	0.02
NODE_10424_length_63_cov_2.000000	6	43.86	76	12	0	94	5	530.62	0.12	0.36
NODE_142777_length_63_cov_3.000000	6	45.74	64	24	0	94	5	532.5	0.18	1.33
NODE_552660_length_6	6	46.8	44	34	0	104	5	533.63	1.01	3.04

2_cov_2.693548		7								
NODE_322486_length_63_cov_2.000000	6	47.37	0	19	109	54	5	534.13	0.20	0.01
NODE_301615_length_31_cov_2.903226	6	48.45	0	16	154	12	5	535.21	0.10	0.14
NODE_433446_length_63_cov_2.000000	6	49.48	0	4	33	145	2	536.24	0.36	0.12
NODE_691240_length_63_cov_2.603175	6	50.36	0	24	51	107	4	537.12	0.33	0.13
NODE_167888_length_63_cov_2.000000	6	51.19	38	21	0	123	5	537.95	0.06	0.65
NODE_233175_length_63_cov_2.000000	6	51.8	44	28	1	109	5	538.56	0.00	0.93
NODE_520553_length_63_cov_2.000000	6	52.41	0	39	60	83	5	539.17	0.01	0.25
NODE_722000_length_62_cov_2.000000	6	53.61	37	23	0	122	5	540.37	0.44	1.07
NODE_258822_length_63_cov_5.317461	6	55.25	27	31	3	121	5	542.01	0.81	0.45
NODE_538708_length_63_cov_2.000000	6	56.28	22	9	0	151	3	543.04	0.71	0.07
NODE_64144_length_63_cov_2.000000	6	57.32	82	19	0	81	5	544.08	0.74	0.07
NODE_337217_length_63_cov_3.000000	6	58.02	98	13	0	71	4	544.78	0.00	0.08
NODE_530440_length_62_cov_2.000000	6	59.04	0	41	59	82	5	545.8	0.75	0.44
NODE_494937_length_63_cov_2.000000	6	59.72	0	19	58	105	5	546.48	0.01	0.04
NODE_508073_length_62_cov_1.725806	6	60.46	45	31	1	105	5	547.22	0.14	0.06
NODE_217942_length_63_cov_4.984127	6	61.14	32	24	0	126	4	547.9	1.41	0.01
NODE_126964_length_63_cov_3.317460	6	62.45	38	21	0	123	3	549.21	2.22	1.40
NODE_613895_length_63_cov_2.000000	6	63.89	1	39	53	89	5	550.65	1.74	0.42
NODE_455210_length_62_cov_3.258065	6	64.6	0	25	32	125	5	551.36	1.15	0.01
NODE_601231_length_63_cov_4.031746	6	65.87	40	27	0	115	5	552.63	1.02	0.88
NODE_540353_length_63_cov_2.952381	6	66.38	0	20	40	122	5	553.14	0.14	0.08
NODE_9449_length_63_cov_2.984127	6	67.55	0	26	39	117	5	554.31	0.02	2.56
NODE_734201_length_63_cov_2.000000	6	68.05	95	28	0	59	5	554.81	0.05	0.60

NODE_700789_length_63_cov_2.000000	6	68.9	23	18	0	141	5	555.66	2.83	0.05
NODE_190283_length_63_cov_2.000000	6	69.95	0	11	62	109	3	556.71	0.00	1.14
NODE_28490_length_63_cov_2.000000	6	71.05	57	49	0	76	5	557.81	0.22	0.03
NODE_249417_length_63_cov_2.000000	6	72.8	0	25	30	127	4	559.56	0.05	0.83
NODE_274377_length_63_cov_2.349206	6	73.37	49	11	0	122	4	560.13	0.71	0.68
NODE_343414_length_62_cov_2.790323	6	74.48	35	31	0	116	4	561.24	0.52	1.24
NODE_776978_length_62_cov_2.000000	6	75.11	8	55	58	61	5	561.87	0.47	0.29
NODE_615351_length_63_cov_3.000000	6	76.43	29	16	0	137	2	563.19	1.68	0.09
NODE_514970_length_63_cov_2.317460	6	77.18	0	31	45	106	5	563.94	0.26	0.02
NODE_601896_length_63_cov_2.000000	6	78.49	0	23	28	131	5	565.25	0.27	0.01
NODE_605506_length_63_cov_2.000000	6	79.42	53	18	0	111	5	566.18	0.03	0.00
NODE_527392_length_63_cov_1.841270	6	80.36	0	25	44	113	5	567.12	0.22	0.05
NODE_396618_length_63_cov_1.920635	6	81.78	95	20	0	67	4	568.54	0.67	0.14
NODE_756015_length_63_cov_3.000000	6	82.9	35	28	0	119	4	569.66	1.08	2.13
NODE_96604_length_63_cov_2.000000	6	83.61	37	24	0	121	5	570.37	0.09	0.14
NODE_216574_length_63_cov_2.063492	6	84.94	28	23	0	131	5	571.7	0.29	1.45
NODE_134610_length_63_cov_3.396825	6	85.6	114	58	1	9	5	572.36	1.05	0.11
NODE_5750_length_63_cov_2.000000	6	86.13	59	56	0	67	5	572.89	1.20	0.14
NODE_474633_length_63_cov_2.000000	6	87.35	0	15	42	125	5	574.11	0.00	0.04
NODE_752223_length_63_cov_2.000000	6	88.28	0	41	40	101	5	575.04	0.14	0.65
NODE_319459_length_62_cov_2.516129	6	89.22	0	20	48	114	5	575.98	0.08	0.04
NODE_169755_length_63_cov_2.000000	6	90.13	0	53	128	1	5	576.89	0.09	0.77
NODE_418280_length_85_cov_2.882353	6	91.87	0	35	128	19	5	578.63	0.00	0.13
NODE_287132_length_3	6	92.5	0	31	134	17	5	579.35	0.59	0.07

1_cov_1.096774		9								
NODE_198632_length_33_cov_1.000000	7	0	0	30	151	1	5	579.35	1.66	0.92
NODE_722037_length_63_cov_2.603175	7	1.66	148	12	0	22	5	581.01	0.03	0.11
NODE_345830_length_63_cov_2.000000	7	2.4	0	12	29	141	5	581.75	1.25	0.14
NODE_460895_length_33_cov_1.848485	7	3.32	63	104	6	9	5	582.67	0.06	0.00
NODE_390486_length_37_cov_1.108108	7	4.98	0	37	138	7	5	584.33	2.39	0.01
NODE_349558_length_63_cov_2.000000	7	6.64	106	19	0	57	5	585.99	1.41	1.17
NODE_481079_length_63_cov_2.000000	7	7.22	0	2	39	141	2	586.57	0.65	0.13
NODE_274995_length_68_cov_2.867647	7	8.3	0	48	56	78	5	587.65	0.36	0.22
NODE_403352_length_98_cov_1.051020	7	9.95	5	50	42	85	5	589.3	0.05	1.32
NODE_506996_length_62_cov_2.870968	7	10.83	41	17	0	124	5	590.18	0.79	0.12
NODE_471242_length_63_cov_2.000000	7	11.61	74	24	0	84	5	590.96	0.45	0.17
NODE_609495_length_63_cov_2.000000	7	13.33	0	21	32	129	4	592.68	0.34	0.21
NODE_429440_length_63_cov_2.666667	7	14.43	0	19	24	139	3	593.78	0.75	0.09
NODE_463122_length_63_cov_2.000000	7	15.64	13	11	0	158	3	594.99	0.69	1.34
NODE_122515_length_63_cov_2.825397	7	16.59	0	27	38	117	5	595.94	3.45	0.07
NODE_74843_length_63_cov_2.460317	7	18.25	34	29	0	119	5	597.6	1.25	0.65
NODE_743883_length_63_cov_3.301587	7	19.91	80	20	0	82	5	599.26	1.20	1.02
NODE_660026_length_63_cov_2.000000	7	21.56	38	32	0	112	5	600.91	0.24	0.39
NODE_660890_length_63_cov_3.730159	7	23.23	82	13	0	87	5	602.58	2.71	0.00
NODE_152548_length_63_cov_1.619048	7	24.89	0	16	90	76	4	604.24	0.02	0.03
NODE_66646_length_63_cov_2.000000	7	26.47	0	11	48	123	4	605.82	0.42	0.21
NODE_507510_length_63_cov_2.587301	7	27.66	28	8	0	146	4	607.01	1.55	0.05
NODE_749803_length_64_cov_1.046875	7	29.86	71	10	0	101	4	609.21	0.17	0.01

NODE_413643_length_63_cov_3.000000	7	31.52	85	61	0	36	5	610.87	0.05	0.24
NODE_404070_length_63_cov_2.142857	7	32.48	0	14	30	138	4	611.83	0.02	0.60
NODE_161657_length_63_cov_3.349206	7	33.83	0	6	12	164	1	613.18	0.16	0.07
NODE_190431_length_63_cov_3.714286	7	34.56	0	7	15	160	3	613.91	0.42	0.00
NODE_367983_length_57_cov_1.140351	7	35.32	28	21	0	133	5	614.67	0.95	0.38
NODE_181420_length_84_cov_3.059524	7	36.5	47	48	5	82	5	615.85	0.19	0.00
NODE_4492_length_63_cov_2.000000	7	37.36	36	32	0	114	5	616.71	2.52	1.30
NODE_679675_length_63_cov_2.000000	7	38.16	29	16	0	137	4	617.51	2.61	1.55
NODE_708015_length_63_cov_2.000000	7	39.64	0	21	98	63	5	618.99	0.38	0.20
NODE_278262_length_63_cov_3.460317	7	40.9	0	19	30	133	5	620.25	0.00	0.03
NODE_616033_length_63_cov_2.000000	7	41.8	0	16	23	143	4	621.15	0.27	0.49
NODE_596014_length_63_cov_2.015873	7	43.14	33	28	0	121	5	622.49	0.15	0.01
NODE_629517_length_63_cov_3.000000	7	44.8	28	23	0	131	5	624.15	2.26	0.01
NODE_643609_length_63_cov_3.000000	7	45.7	29	15	0	138	2	625.05	1.08	0.05
NODE_240357_length_63_cov_3.000000	7	46.29	0	10	86	86	4	625.64	0.56	0.76
NODE_139839_length_64_cov_1.359375	7	48.12	43	28	1	110	5	627.47	0.15	0.47
NODE_389174_length_62_cov_2.419355	7	49.77	60	21	0	101	5	629.12	0.00	1.48
NODE_177727_length_63_cov_3.190476	7	51.58	0	15	21	146	4	630.93	0.18	0.03
NODE_83651_length_63_cov_2.000000	7	53.1	47	30	0	105	5	632.45	0.15	0.40
NODE_140076_length_62_cov_2.629032	7	54.75	52	25	0	105	5	634.1	0.03	0.03
NODE_240183_length_63_cov_2.555556	7	58.07	31	28	0	123	5	637.42	0.34	0.07
NODE_546978_length_63_cov_3.000000	7	59.73	1	16	18	147	3	639.08	1.10	0.41
NODE_21416_length_63_cov_2.000000	7	61.39	0	14	25	143	4	640.74	1.11	0.19
NODE_287526_length_6	7	63.0	64	68	9	41	5	642.4	1.28	0.23

3_cov_2.984127		5								
NODE_223902_length_63_cov_2.000000	7	64.68	0	31	32	119	5	644.03	0.13	2.00
NODE_24966_length_63_cov_2.603175	7	66.37	0	21	39	122	5	645.72	0.67	0.08
NODE_64947_length_63_cov_2.904762	7	68.03	0	27	60	95	5	647.38	3.42	0.62
NODE_674675_length_62_cov_2.790323	7	69.68	40	37	0	105	5	649.03	0.07	1.58
NODE_302433_length_62_cov_2.064516	7	71.34	0	18	40	124	5	650.69	0.05	0.01
NODE_443697_length_63_cov_2.253968	7	72.8	19	17	0	146	5	652.15	1.31	0.00
NODE_447396_length_63_cov_2.571429	7	76.32	82	10	0	90	5	655.67	0.14	1.10
NODE_477106_length_63_cov_4.587302	7	77.98	69	41	0	72	5	657.33	0.03	3.12
NODE_778366_length_62_cov_2.000000	7	79.64	0	32	55	95	5	658.99	1.58	0.01
NODE_96294_length_63_cov_2.000000	7	81.3	0	40	38	104	5	660.65	0.28	0.01
NODE_630855_length_63_cov_2.920635	7	83.1	30	7	0	145	4	662.45	0.00	0.01
NODE_332969_length_63_cov_2.000000	7	84.62	39	19	0	124	5	663.97	0.28	0.21
NODE_518355_length_62_cov_2.000000	7	87.93	53	27	0	102	5	667.28	0.18	0.06
NODE_357123_length_63_cov_2.793651	7	89.59	0	16	32	134	4	668.94	0.00	0.08
NODE_420387_length_63_cov_2.000000	7	91.25	38	28	0	116	5	670.6	1.08	2.40
NODE_106483_length_63_cov_3.412699	7	92.91	1	39	42	100	5	672.26	0.20	0.09
NODE_107142_length_63_cov_2.000000	7	94.57	0	35	104	43	5	673.92	0.26	0.19
NODE_572662_length_63_cov_2.000000	7	96.22	0	26	109	47	5	675.57	0.55	0.72
NODE_672166_length_87_cov_1.149425	8	0	100	27	0	55	5	675.57	1.28	0.30
NODE_109586_length_63_cov_2.095238	8	1.52	0	28	44	110	5	677.09	0.00	0.08
NODE_101256_length_63_cov_2.000000	8	2.98	1	24	44	113	5	678.55	0.07	0.03
NODE_598100_length_63_cov_2.000000	8	4.47	0	31	37	114	5	680.04	0.01	0.59
NODE_160320_length_63_cov_4.825397	8	5.96	37	11	0	134	5	681.53	1.05	0.34

NODE_769167_length_62_cov_2.000000	8	7.45	0	11	22	149	4	683.02	0.35	0.13
NODE_480804_length_63_cov_3.000000	8	8.94	0	15	97	70	4	684.51	1.74	0.88
NODE_701582_length_63_cov_2.000000	8	10.43	0	16	44	122	5	686	0.03	0.25
NODE_777178_length_63_cov_2.000000	8	11.92	57	18	0	107	5	687.49	0.31	1.14
NODE_690527_length_63_cov_2.000000	8	13.41	37	6	0	139	3	688.98	0.27	1.89
NODE_432872_length_63_cov_2.000000	8	16.38	26	19	0	137	5	691.95	0.60	0.18
NODE_561656_length_62_cov_2.000000	8	17.88	74	28	0	80	5	693.45	0.37	0.04
NODE_248887_length_63_cov_2.571429	8	19.36	34	28	0	120	5	694.93	0.02	0.00
NODE_49117_length_63_cov_2.000000	8	20.85	34	16	0	132	5	696.42	0.32	0.50
NODE_266488_length_63_cov_2.984127	8	22.34	0	24	47	111	5	697.91	0.20	0.46
NODE_639572_length_62_cov_1.000000	8	23.83	76	12	0	94	4	699.4	0.11	1.48
NODE_414215_length_63_cov_2.000000	8	25.32	0	15	22	145	5	700.89	0.15	0.30
NODE_263981_length_63_cov_2.000000	8	26.81	68	50	0	64	5	702.38	0.04	0.02
NODE_352627_length_63_cov_2.000000	8	28.3	0	4	29	149	4	703.87	0.26	0.00
NODE_601420_length_63_cov_2.000000	8	29.79	39	34	0	109	5	705.36	1.09	2.00
NODE_180279_length_63_cov_2.000000	8	31.29	0	8	28	146	3	706.86	0.40	0.27
NODE_183758_length_63_cov_2.000000	8	32.77	56	12	0	114	4	708.34	0.19	0.01
NODE_350997_length_63_cov_2.698413	8	34.76	11	4	0	167	2	710.33	0.91	0.04
NODE_671957_length_63_cov_2.000000	8	35.75	44	15	0	123	5	711.32	0.23	0.10
NODE_777793_length_63_cov_2.539683	8	37.24	0	15	50	117	5	712.81	0.03	0.01
NODE_505551_length_63_cov_2.619048	8	38.73	141	29	0	12	5	714.3	0.33	0.02
NODE_320205_length_63_cov_2.238095	8	40.22	0	26	123	33	5	715.79	0.00	0.02
NODE_170882_length_104_cov_1.298077	8	41.71	104	11	0	67	5	717.28	2.33	0.02
NODE_140988_length_6	8	43.2	0	28	46	108	5	718.77	0.00	0.07

3_cov_3.603175										
NODE_766951_length_63_cov_3.063492	8	44.68	48	24	0	110	5	720.25	0.01	0.45
NODE_703715_length_63_cov_2.000000	8	46.18	0	24	31	127	5	721.75	0.00	0.62
NODE_395254_length_63_cov_2.000000	8	52.14	0	21	121	40	4	727.71	0.23	0.23
NODE_597369_length_63_cov_2.000000	8	55.11	58	40	5	79	5	730.68	0.22	1.36
NODE_562676_length_63_cov_2.000000	8	56.6	79	12	0	91	4	732.17	1.76	0.01
NODE_26095_length_63_cov_2.000000	8	58.1	0	32	45	105	5	733.67	0.12	0.01
NODE_169389_length_63_cov_2.000000	8	59.58	86	19	0	77	5	735.15	1.83	0.53
NODE_318057_length_62_cov_1.048387	8	61.07	17	12	0	153	4	736.64	0.07	1.58
NODE_109277_length_63_cov_2.000000	8	62.56	0	24	50	108	5	738.13	1.60	0.21
NODE_430132_length_62_cov_2.000000	8	64.05	29	13	0	140	5	739.62	0.27	0.24
NODE_366933_length_47_cov_1.191489	8	67.03	42	36	7	97	5	742.6	1.45	0.18
NODE_284519_length_62_cov_1.935484	8	68.52	37	17	0	128	5	744.09	0.06	0.01
NODE_162690_length_63_cov_2.761905	8	70.01	0	23	51	108	5	745.58	0.00	0.04
NODE_702988_length_63_cov_2.000000	8	71.5	31	29	0	122	5	747.07	0.00	0.42
NODE_287326_length_63_cov_2.460317	8	73.01	83	21	0	78	5	748.58	1.41	0.13
NODE_108455_length_63_cov_2.000000	8	74.48	0	10	47	125	5	750.05	0.00	0.58
NODE_661118_length_82_cov_1.390244	8	75.97	59	32	0	91	5	751.54	0.37	0.24
NODE_167418_length_62_cov_2.983871	8	77.46	60	16	0	106	5	753.03	0.24	0.00
NODE_725768_length_63_cov_6.301587	8	78.94	76	25	0	81	5	754.51	0.55	0.25
NODE_24633_length_63_cov_1.523810	8	80.44	0	14	24	144	4	756.01	0.75	0.06
NODE_750140_length_63_cov_3.126984	8	81.93	0	10	56	116	5	757.5	0.46	1.00
NODE_694425_length_63_cov_2.698413	8	83.41	32	29	0	121	5	758.98	0.01	0.24
NODE_779269_length_63_cov_2.000000	8	84.91	1	52	61	68	5	760.48	0.06	0.61

NODE_261948_length_63_cov_2.301587	8	86.89	39	12	0	131	5	762.46	0.04	0.88
NODE_711030_length_62_cov_1.032258	8	87.89	0	15	25	142	5	763.46	0.34	1.36
NODE_312354_length_63_cov_2.507936	8	90.86	0	26	47	109	5	766.43	0.48	0.30
NODE_643536_length_63_cov_2.000000	8	92.24	16	4	0	162	1	767.81	0.02	0.63
NODE_111417_length_62_cov_1.000000	8	93.85	0	50	129	3	5	769.42	0.81	0.14
NODE_515353_length_120_cov_2.241667	8	95.33	8	46	32	96	5	770.9	0.31	0.07
NODE_758539_length_63_cov_2.000000	8	96.82	0	15	61	106	5	772.39	1.36	0.02
NODE_27217_length_62_cov_2.000000	8	98.31	0	12	57	113	3	773.88	0.17	0.05
NODE_416665_length_63_cov_3.000000	8	99.8	0	35	40	107	5	775.37	1.46	0.17
NODE_322265_length_63_cov_1.190476	8	101.29	44	41	1	96	5	776.86	0.42	0.63
NODE_155602_length_62_cov_2.000000	8	102.78	52	14	0	116	4	778.35	0.81	0.06
NODE_185235_length_84_cov_1.809524	8	104.27	40	23	0	119	5	779.84	0.08	0.39
NODE_165292_length_63_cov_2.000000	8	105.76	0	11	14	157	2	781.33	0.07	0.16
NODE_775195_length_63_cov_3.000000	8	107.16	97	20	0	65	5	782.73	0.20	0.03
NODE_15747_length_121_cov_2.239669	9	0	62	89	14	17	5	782.73	0.69	0.01
NODE_194464_length_63_cov_2.000000	9	1.56	43	28	0	111	5	784.29	1.75	0.78
NODE_245443_length_63_cov_3.000000	9	2.9	44	36	0	102	5	785.63	1.21	0.37
NODE_760828_length_63_cov_2.968254	9	3.69	18	17	0	147	4	786.42	0.10	0.03
NODE_406398_length_63_cov_3.492064	9	4.35	0	21	104	57	3	787.08	0.07	0.19
NODE_295130_length_63_cov_2.222222	9	5.92	0	18	29	135	5	788.65	0.08	0.35
NODE_757518_length_63_cov_3.000000	9	7.32	0	14	24	144	5	790.05	0.07	1.08
NODE_206538_length_63_cov_2.603175	9	8.66	65	30	0	87	5	791.39	0.45	0.24
NODE_721790_length_62_cov_2.096774	9	10.17	0	15	108	59	5	792.9	0.00	0.60
NODE_249284_length_6	9	11.6	0	12	113	57	5	794.35	0.36	0.02

3_cov_3.793651		2								
NODE_52041_length_63_cov_2.396825	9	12.29	20	16	0	146	1	795.02	0.66	0.43
NODE_481951_length_63_cov_2.587301	9	13.08	59	34	0	89	5	795.81	0.49	2.00
NODE_219851_length_81_cov_2.962963	9	14.76	137	20	0	25	5	797.49	0.12	0.12
NODE_686585_length_63_cov_2.000000	9	15.98	0	27	43	112	5	798.71	0.00	0.17
NODE_97824_length_57_cov_1.368421	9	17.43	1	32	33	116	5	800.16	1.10	0.00
NODE_527255_length_63_cov_2.000000	9	18.89	59	32	0	91	5	801.62	0.02	0.08
NODE_181298_length_63_cov_2.000000	9	20.5	33	17	0	132	5	803.23	0.38	0.57
NODE_605964_length_35_cov_1.000000	9	21.35	1	135	46	0	5	804.08	0.05	0.19
NODE_87555_length_62_cov_2.580645	9	23.25	68	25	0	89	5	805.98	0.96	0.03
NODE_239916_length_63_cov_2.619048	9	24.7	54	12	0	116	5	807.43	0.17	1.39
NODE_616508_length_63_cov_2.000000	9	26.15	47	13	0	122	4	808.88	0.00	1.00
NODE_383409_length_63_cov_2.952381	9	27.05	0	8	69	105	4	809.78	0.61	0.14
NODE_429944_length_63_cov_2.825397	9	27.61	24	13	0	145	3	810.34	0.25	0.52
NODE_721075_length_63_cov_3.000000	9	29.05	49	38	0	95	4	811.78	0.01	0.18
NODE_50243_length_63_cov_2.000000	9	30.51	0	28	87	67	5	813.24	0.00	0.01
NODE_525390_length_63_cov_2.000000	9	31.96	0	15	24	143	4	814.69	0.02	0.03
NODE_617081_length_63_cov_3.761905	9	33.2	38	37	0	107	5	815.93	2.02	0.22
NODE_602433_length_63_cov_2.000000	9	34.42	38	24	0	120	4	817.15	0.08	0.84
NODE_247716_length_63_cov_5.682539	9	35.26	39	23	0	120	5	817.99	0.23	3.64
NODE_234827_length_63_cov_3.000000	9	36.32	12	8	0	162	2	819.05	0.00	1.53
NODE_440385_length_63_cov_2.000000	9	37.77	0	23	51	108	5	820.5	3.50	0.02
NODE_9817_length_65_cov_2.046154	9	39.15	70	5	0	107	4	821.88	1.81	1.53
NODE_310344_length_54_cov_1.074074	9	40.62	1	35	36	110	5	823.35	0.09	0.01

NODE_524584_length_63_cov_2.000000	9	42.13	0	6	27	149	2	824.86	0.22	0.01
NODE_232910_length_63_cov_2.000000	9	43.59	36	14	0	132	5	826.32	0.47	1.13
NODE_444707_length_63_cov_2.000000	9	47.95	21	20	0	141	4	830.68	0.30	0.06
NODE_336361_length_63_cov_2.000000	9	49.33	21	16	0	145	3	832.06	0.08	0.20
NODE_480605_length_63_cov_6.063492	9	50.85	0	14	37	131	5	833.58	0.00	2.75
NODE_430664_length_63_cov_2.000000	9	52.3	0	33	60	89	5	835.03	1.27	1.11
NODE_730319_length_63_cov_2.984127	9	53.76	0	23	82	77	5	836.49	0.00	0.09
NODE_380402_length_62_cov_2.983871	9	55.21	69	31	0	82	5	837.94	0.81	0.19
NODE_7197_length_63_cov_2.015873	9	56.55	0	19	31	132	4	839.28	0.09	0.01
NODE_52180_length_75_cov_1.053333	9	58.11	0	70	67	45	5	840.84	1.26	3.23
NODE_778402_length_63_cov_2.000000	9	59.57	51	15	0	116	5	842.3	0.13	0.00
NODE_207489_length_63_cov_2.000000	9	61.02	82	18	0	82	5	843.75	0.65	0.84
NODE_412691_length_63_cov_2.460317	9	62.47	106	16	0	60	5	845.2	0.00	0.06
NODE_102414_length_63_cov_1.841270	9	63.93	30	16	0	136	4	846.66	0.28	0.29
NODE_494611_length_94_cov_1.021277	9	65.38	33	31	1	117	5	848.11	0.02	1.19
NODE_97408_length_106_cov_2.283019	9	66.83	30	12	0	140	5	849.56	0.17	0.51
NODE_406321_length_63_cov_4.809524	9	68.29	32	14	0	136	5	851.02	0.02	0.04
NODE_732197_length_62_cov_3.758065	9	69.74	35	28	0	119	5	852.47	0.45	1.44
NODE_719755_length_63_cov_2.000000	9	71.19	37	39	0	106	5	853.92	0.64	0.28
NODE_394313_length_63_cov_2.000000	9	72.7	12	5	0	165	3	855.43	1.22	0.00
NODE_663929_length_63_cov_1.841270	9	73.77	120	13	0	49	4	856.5	0.27	0.11
NODE_103341_length_63_cov_2.000000	9	76.22	1	23	34	124	5	858.95	0.66	0.02
NODE_352854_length_63_cov_3.000000	9	77	0	8	112	62	4	859.73	0.08	0.45
NODE_574129_length_6	9	78.4	0	14	146	22	5	861.19	0.19	0.01

2_cov_2.000000		6								
NODE_624049_length_63_cov_2.000000	9	79.91	30	17	0	135	2	862.64	0.01	0.10
NODE_349885_length_63_cov_2.000000	9	81.29	0	20	22	140	4	864.02	0.00	0.13
NODE_691808_length_62_cov_3.000000	9	82.82	125	24	0	33	5	865.55	0.14	0.00
NODE_594064_length_63_cov_2.000000	9	84.04	0	19	59	104	5	866.77	0.27	1.48
NODE_240481_length_63_cov_2.000000	9	85.72	0	35	41	106	4	868.45	0.73	1.68
NODE_537032_length_63_cov_2.000000	9	87.25	28	21	0	133	5	869.98	0.13	2.11
NODE_549581_length_62_cov_2.000000	9	88.51	35	40	0	107	5	871.24	0.60	0.15
NODE_49985_length_63_cov_2.904762	9	90.97	0	16	42	124	4	873.7	0.07	0.00
NODE_25471_length_63_cov_2.000000	9	91.53	87	14	0	81	5	874.26	0.00	0.06
NODE_562318_length_63_cov_2.000000	9	92.99	0	11	34	137	5	875.72	0.80	0.57
NODE_703598_length_63_cov_2.000000	9	94.43	44	22	0	116	5	877.16	2.18	0.00
NODE_613247_length_64_cov_2.406250	9	95.89	123	44	0	15	5	878.62	0.06	0.17
NODE_199916_length_63_cov_2.063492	10	0	121	10	0	51	4	878.62	0.06	0.06
NODE_597830_length_63_cov_1.730159	10	1.59	49	35	0	98	5	880.21	1.07	0.32
NODE_307084_length_63_cov_3.984127	10	2.94	0	26	47	109	5	881.56	1.37	0.02
NODE_13873_length_63_cov_2.000000	10	4.42	0	15	19	148	5	883.04	0.04	0.04
NODE_317988_length_63_cov_2.634921	10	5.69	0	42	41	99	5	884.31	2.02	2.72
NODE_75095_length_67_cov_1.746269	10	6.54	0	19	80	83	5	885.16	0.52	0.21
NODE_620724_length_62_cov_2.629032	10	7.36	0	20	90	72	5	885.98	0.70	0.01
NODE_470337_length_63_cov_3.000000	10	8.84	0	16	63	103	4	887.46	0.13	0.04
NODE_575050_length_62_cov_2.000000	10	10.31	41	26	0	115	5	888.93	0.82	0.01
NODE_654103_length_63_cov_2.000000	10	11.78	28	24	2	128	5	890.4	0.56	0.08
NODE_336754_length_63_cov_2.000000	10	13.03	33	38	4	107	5	891.65	5.15	0.04

NODE_361217_length_63_cov_3.761905	10	14.73	0	10	41	131	5	893.35	1.03	0.01
NODE_81872_length_65_cov_2.292308	10	15.36	2	9	17	154	3	893.98	0.08	0.81
NODE_467968_length_63_cov_2.571429	10	16.2	55	23	0	104	5	894.82	0.21	0.01
NODE_603875_length_63_cov_5.000000	10	17.68	0	5	22	155	4	896.3	0.20	0.12
NODE_97622_length_63_cov_2.000000	10	19.15	0	30	40	112	5	897.77	0.02	0.82
NODE_473329_length_63_cov_2.000000	10	20.62	30	14	0	138	4	899.24	1.15	0.11
NODE_93515_length_63_cov_2.000000	10	22.1	0	14	47	121	5	900.72	0.00	2.84
NODE_469734_length_62_cov_2.000000	10	23.57	0	50	130	2	5	902.19	0.81	0.07
NODE_92179_length_63_cov_2.000000	10	25.04	0	27	95	60	5	903.66	0.16	0.03
NODE_477125_length_63_cov_5.238095	10	26.51	38	18	0	126	4	905.13	1.54	0.13
NODE_313403_length_63_cov_2.000000	10	27.99	39	24	0	119	5	906.61	0.06	0.29
NODE_768395_length_63_cov_2.000000	10	29.46	0	33	30	119	5	908.08	0.18	0.11
NODE_571577_length_63_cov_3.904762	10	30.94	0	23	28	131	4	909.56	0.00	0.10
NODE_61256_length_63_cov_4.158730	10	35.15	33	29	0	120	5	913.77	0.15	0.35
NODE_535283_length_63_cov_2.000000	10	38.33	0	23	38	121	5	916.95	0.00	0.49
NODE_419042_length_63_cov_2.507936	10	39.77	61	23	0	98	5	918.39	0.35	0.92
NODE_572136_length_63_cov_2.809524	10	41.25	34	29	0	119	5	919.87	1.50	0.04
NODE_590526_length_63_cov_3.000000	10	42.19	157	24	0	1	5	920.81	0.00	0.19
NODE_374788_length_63_cov_2.587301	10	44.19	34	22	0	126	5	922.81	0.26	0.19
NODE_592890_length_63_cov_3.460317	10	45.68	1	22	34	125	5	924.3	1.83	0.01
NODE_48125_length_63_cov_2.000000	10	47.13	0	34	83	65	5	925.75	0.52	0.10
NODE_154954_length_63_cov_2.000000	10	48.61	0	28	51	103	5	927.23	0.01	0.12
NODE_320581_length_62_cov_1.000000	10	49.53	14	10	0	158	4	928.15	0.25	0.05
NODE_528134_length_6	10	51.3	46	26	0	110	5	930	0.35	1.53

2_cov_2.677419		8								
NODE_370694_length_63_cov_3.730159	10	53.03	39	28	0	115	4	931.65	0.01	0.02
NODE_633912_length_63_cov_2.952381	10	54.50	0	22	35	125	5	933.12	1.24	0.00
NODE_730398_length_63_cov_2.000000	10	55.97	66	24	0	92	5	934.59	2.74	0.29
NODE_468176_length_63_cov_2.000000	10	56.73	0	3	7	172	1	935.35	0.05	0.05
NODE_573383_length_63_cov_4.000000	10	60.39	22	21	0	139	5	939.01	0.08	0.00
NODE_431781_length_63_cov_2.000000	10	66.29	0	27	55	100	5	944.91	0.55	0.02
NODE_166665_length_63_cov_4.301587	10	67.76	26	13	0	143	5	946.38	0.11	0.11
NODE_669763_length_62_cov_2.000000	10	69.23	0	4	22	156	3	947.85	0.57	0.01
NODE_428859_length_63_cov_3.111111	10	70.3	76	9	0	97	3	948.92	0.57	0.23
NODE_431388_length_63_cov_3.000000	10	72.18	0	8	28	146	4	950.8	0.59	0.11
NODE_764848_length_63_cov_2.174603	10	75.13	22	18	0	142	5	953.75	0.02	0.69
NODE_612804_length_63_cov_2.000000	10	76.79	52	10	0	120	5	955.41	0.13	0.01
NODE_22157_length_63_cov_4.968254	10	78.07	49	22	0	111	5	956.69	0.16	0.02
NODE_494742_length_63_cov_2.000000	10	79.54	0	21	35	126	5	958.16	0.77	0.45
NODE_382118_length_63_cov_3.000000	10	81.01	95	18	0	69	4	959.63	0.06	0.14
NODE_221182_length_63_cov_2.015873	10	83.96	32	26	0	124	5	962.58	0.07	1.03
NODE_520282_length_63_cov_2.000000	10	85.61	1	34	39	108	5	964.22	0.07	0.02
NODE_76601_length_63_cov_2.190476	10	88.38	11	5	0	166	2	967	0.93	0.22
NODE_81490_length_63_cov_3.587301	10	89.85	31	17	0	134	4	968.47	0.02	0.91
NODE_324046_length_62_cov_3.000000	10	91.29	0	16	39	127	5	969.91	0.17	0.48
NODE_601671_length_63_cov_2.095238	10	93.03	22	15	0	145	4	971.65	0.60	0.01
NODE_588471_length_63_cov_3.031746	10	94.28	0	15	38	129	5	972.9	0.01	1.45
NODE_131204_length_85_cov_2.317647	10	95.75	0	16	41	125	5	974.37	1.38	1.45

NODE_772621_length_63_cov_2.809524	10	97.22	0	23	38	121	5	975.84	0.51	0.97
NODE_520373_length_63_cov_3.079365	10	98.66	29	8	0	145	4	977.28	0.17	0.27
NODE_367358_length_62_cov_2.000000	10	100.07	0	18	45	119	5	978.69	0.02	0.46
NODE_742341_length_63_cov_2.000000	10	103.11	29	24	0	129	5	981.73	0.12	0.00
NODE_645742_length_62_cov_2.419355	10	104.25	0	34	62	86	5	982.87	0.18	0.00
NODE_9451_length_62_cov_2.258065	10	106.06	79	24	0	79	5	984.68	0.03	0.05
NODE_613159_length_43_cov_1.139535	11	0	131	30	0	21	5	984.68	0.97	0.45
NODE_492239_length_63_cov_2.000000	11	1.53	13	10	0	159	3	986.21	0.45	0.26
NODE_64838_length_63_cov_3.000000	11	2.47	30	19	0	133	4	987.15	0.03	0.47
NODE_478379_length_63_cov_2.063492	11	4.47	29	25	0	128	4	989.15	0.06	0.24
NODE_10565_length_176_cov_4.113636	11	6.03	0	33	38	111	5	990.71	0.80	0.00
NODE_388323_length_63_cov_3.873016	11	7.45	1	16	24	141	4	992.13	1.04	0.00
NODE_47000_length_63_cov_2.603175	11	10.43	1	26	32	123	5	995.11	1.81	0.44
NODE_7486_length_62_cov_2.000000	11	13.51	28	27	0	127	5	998.19	0.08	0.12
NODE_658846_length_63_cov_2.000000	11	14.9	28	16	0	138	4	999.58	0.18	0.43
NODE_395098_length_63_cov_3.111111	11	16.39	0	32	31	119	5	1001.07	1.64	1.50
NODE_546820_length_63_cov_2.555556	11	17.88	21	11	0	150	5	1002.56	0.10	0.73
NODE_202100_length_63_cov_2.523809	11	19.37	0	16	26	140	3	1004.05	0.27	0.14
NODE_13724_length_63_cov_2.000000	11	20.86	34	22	0	126	5	1005.54	0.06	0.62
NODE_366603_length_63_cov_3.000000	11	22.72	0	13	15	154	3	1007.4	0.01	0.39
NODE_497205_length_63_cov_2.206349	11	25.33	22	11	0	149	3	1010.01	0.02	0.12
NODE_493116_length_63_cov_3.000000	11	26.82	93	43	0	46	5	1011.5	0.09	0.01
NODE_462890_length_63_cov_4.761905	11	28.31	0	11	34	137	5	1012.99	0.21	0.19
NODE_480581_length_6	11	29.8	1	35	33	113	5	1014.4	0.55	0.00

3_cov_2.000000								8		
NODE_196941_length_63_cov_2.777778	11	31.29	57	12	0	113	5	1015.97	0.39	0.14
NODE_276285_length_37_cov_1.000000	11	32.78	1	87	90	4	5	1017.46	0.05	0.62
NODE_233304_length_63_cov_2.000000	11	33.37	25	5	0	152	3	1018.05	0.15	0.24
NODE_708575_length_62_cov_2.000000	11	35.76	1	20	31	130	5	1020.44	1.04	0.85
NODE_739842_length_63_cov_2.000000	11	40.22	2	58	92	30	5	1024.9	1.84	0.42
NODE_756026_length_63_cov_2.000000	11	41.72	37	18	0	127	5	1026.4	0.36	0.01
NODE_654276_length_63_cov_2.000000	11	43.25	86	7	0	89	4	1027.93	0.92	0.84
NODE_156438_length_63_cov_2.079365	11	44.74	41	15	0	126	5	1029.38	0.04	0.14
NODE_255907_length_68_cov_1.102941	11	45.73	0	21	84	77	5	1030.41	0.00	0.18
NODE_529104_length_62_cov_2.000000	11	46.39	49	19	0	114	5	1031.07	0.00	0.03
NODE_691634_length_63_cov_2.000000	11	49.43	62	34	0	86	5	1034.11	0.49	0.97
NODE_520621_length_63_cov_2.000000	11	50.66	0	7	36	139	3	1035.34	0.58	0.02
NODE_500586_length_63_cov_2.873016	11	54.38	0	4	9	169	1	1039.06	0.40	0.00
NODE_341419_length_63_cov_3.777778	11	55.12	14	10	0	158	2	1039.8	0.35	0.00
NODE_754659_length_63_cov_2.000000	11	56.61	0	7	47	128	4	1041.29	0.79	0.04
NODE_580177_length_63_cov_2.412699	11	58.11	36	27	0	119	5	1042.79	0.07	0.01
NODE_639109_length_63_cov_3.000000	11	59.51	0	19	31	132	5	1044.19	0.04	0.14
NODE_758828_length_62_cov_1.467742	11	61.08	0	24	68	90	5	1045.76	0.04	0.99
NODE_662701_length_63_cov_4.714286	11	62.57	0	12	22	148	5	1047.25	0.36	0.06
NODE_520067_length_63_cov_3.000000	11	68.53	56	6	0	120	4	1053.21	0.00	0.23
NODE_682723_length_63_cov_2.000000	11	70.02	36	26	3	117	5	1054.7	0.93	0.75
NODE_492135_length_33_cov_1.242424	11	71.51	90	13	0	79	5	1056.19	0.23	0.06
NODE_193425_length_63_cov_3.460317	11	73	0	10	12	160	3	1057.68	0.22	1.22

NODE_335112_length_62_cov_2.000000	11	74.49	0	19	23	140	4	1059.17	0.01	0.22
NODE_672102_length_63_cov_2.000000	11	75.98	0	11	65	106	4	1060.66	0.23	0.07
NODE_383894_length_66_cov_1.712121	11	78.96	0	12	24	146	4	1063.64	0.18	0.01
NODE_18415_length_63_cov_4.619048	11	80.45	0	3	5	174	1	1065.13	0.00	0.91
NODE_93494_length_63_cov_2.650794	11	86.41	43	13	0	126	4	1071.09	0.57	0.09
NODE_730810_length_63_cov_2.587301	11	87.91	11	6	0	165	1	1072.58	0.56	0.30
NODE_427557_length_63_cov_2.000000	11	89.39	1	27	45	109	5	1074.07	0.13	0.42
NODE_360827_length_63_cov_4.952381	11	91.02	27	20	0	135	3	1075.7	2.26	0.16
NODE_679141_length_63_cov_2.000000	11	93.86	0	15	43	124	4	1078.54	0.63	0.92
NODE_497628_length_63_cov_2.000000	11	95.17	0	3	8	171	1	1079.85	1.04	0.26
NODE_75446_length_63_cov_2.000000	11	97.29	0	22	22	138	5	1081.97	0.58	1.13
NODE_776097_length_63_cov_2.000000	11	100.11	9	6	0	167	2	1084.79	0.12	0.25
NODE_609716_length_63_cov_4.047619	11	101.3	18	16	0	148	4	1085.98	1.73	0.00
NODE_248596_length_63_cov_2.000000	11	102.8	0	10	13	159	2	1087.48	0.30	0.10
NODE_535885_length_63_cov_2.015873	11	105.06	23	11	0	148	2	1089.74	0.00	0.14
NODE_251464_length_77_cov_7.662338	11	107.27	45	12	0	125	5	1091.95	0.48	0.00
NODE_541721_length_31_cov_1.000000	11	108.76	0	54	106	22	5	1093.44	0.19	0.04
NODE_91839_length_63_cov_3.000000	12	0	0	26	79	77	5	1093.44	0.34	2.12
NODE_285758_length_63_cov_2.000000	12	1.59	0	23	32	127	5	1095.03	0.04	0.09
NODE_679373_length_63_cov_2.873016	12	3.18	0	26	39	117	5	1096.62	0.58	0.34
NODE_626106_length_63_cov_2.000000	12	4.73	61	9	0	112	5	1098.17	0.06	0.02
NODE_364263_length_63_cov_2.825397	12	6.36	32	32	0	118	5	1099.8	0.00	0.08
NODE_618358_length_63_cov_3.317460	12	7.95	27	21	0	134	4	1101.39	1.20	0.14
NODE_116858_length_6	12	9.54	0	14	31	137	5	1102.9	0.15	0.05

3_cov_2.587301								8		
NODE_198542_length_63_cov_2.000000	12	11.12	80	10	0	92	3	1104.56	1.43	0.36
NODE_63834_length_63_cov_2.904762	12	12.72	0	17	22	143	4	1106.16	0.37	0.24
NODE_512240_length_62_cov_2.274194	12	14.31	0	19	31	132	4	1107.75	0.82	0.83
NODE_138015_length_62_cov_2.000000	12	15.89	0	22	37	123	4	1109.33	0.70	2.36
NODE_127772_length_118_cov_1.228814	12	19.07	0	34	78	70	5	1112.51	0.21	0.04
NODE_308788_length_63_cov_3.000000	12	20.66	1	51	41	89	5	1114.1	0.79	0.52
NODE_196002_length_31_cov_1.161290	12	22.25	0	35	146	1	5	1115.69	0.30	0.03
NODE_295643_length_63_cov_2.000000	12	23.84	38	30	0	114	5	1117.28	0.04	0.57
NODE_483233_length_62_cov_2.000000	12	25.43	0	14	77	91	5	1118.87	0.21	0.34
NODE_120442_length_62_cov_2.951613	12	27.02	97	32	0	53	5	1120.46	0.00	0.22
NODE_160212_length_63_cov_2.000000	12	28.61	0	17	65	100	5	1122.05	0.07	1.03
NODE_656535_length_63_cov_2.079365	12	30.2	68	13	0	101	4	1123.64	0.95	0.04
NODE_636002_length_63_cov_1.730159	12	31.79	13	7	0	162	2	1125.23	0.28	0.31
NODE_622462_length_62_cov_2.000000	12	33.38	41	17	0	124	5	1126.82	0.07	0.01
NODE_655523_length_63_cov_2.000000	12	34.97	0	21	30	131	5	1128.41	0.00	0.10
NODE_351693_length_63_cov_3.000000	12	36.56	55	48	0	79	5	1130	0.94	0.26
NODE_416496_length_63_cov_1.031746	12	38.15	0	20	84	78	5	1131.59	0.77	0.01
NODE_39761_length_63_cov_2.857143	12	39.74	23	6	0	153	1	1133.18	0.96	0.78
NODE_525620_length_63_cov_2.095238	12	41.33	0	9	28	145	4	1134.77	0.89	0.15
NODE_590382_length_63_cov_2.000000	12	42.92	0	20	95	67	4	1136.36	0.55	0.24
NODE_497366_length_63_cov_1.587302	12	44.51	3	27	32	120	5	1137.95	0.22	0.00
NODE_422043_length_36_cov_1.527778	12	46.1	71	52	0	59	5	1139.54	0.29	0.30
NODE_169438_length_63_cov_3.714286	12	47.69	0	12	26	144	5	1141.13	0.04	0.09

NODE_366473_length_63_cov_2.000000	12	49.28	0	27	65	90	5	1142.72	0.00	0.11
NODE_501534_length_63_cov_2.000000	12	50.87	57	24	0	101	5	1144.31	0.25	1.19
NODE_129968_length_63_cov_4.619048	12	52.46	132	12	0	38	5	1145.9	0.02	0.00
NODE_270842_length_63_cov_2.000000	12	54.05	47	39	1	95	5	1147.49	0.13	0.02
NODE_613678_length_63_cov_3.190476	12	55.64	62	14	0	106	4	1149.08	0.33	0.26
NODE_136220_length_62_cov_2.000000	12	57.22	31	22	0	129	3	1150.66	0.02	0.35
NODE_10401_length_62_cov_2.000000	12	58.82	0	14	37	131	5	1152.26	0.07	0.00
NODE_539207_length_63_cov_2.000000	12	60.41	33	25	0	124	5	1153.85	0.01	0.84
NODE_754679_length_62_cov_2.000000	12	61.99	0	9	32	141	4	1155.43	1.22	0.03
NODE_170174_length_63_cov_2.000000	12	63.58	26	16	0	140	5	1157.02	0.03	0.02
NODE_231670_length_76_cov_1.657895	12	65.17	0	36	44	102	5	1158.61	0.01	0.04
NODE_662795_length_63_cov_3.841270	12	66.76	38	36	0	108	5	1160.2	1.53	0.37
NODE_332302_length_64_cov_2.921875	12	68.36	0	36	40	106	5	1161.8	4.38	3.11
NODE_136968_length_63_cov_2.571429	12	69.94	26	16	0	140	3	1163.38	0.00	0.21
NODE_2620_length_100_cov_1.690000	12	71.53	42	34	0	106	5	1164.97	0.44	0.75
NODE_611936_length_63_cov_2.587301	12	73.12	36	26	0	120	5	1166.56	0.06	0.04
NODE_248832_length_62_cov_2.000000	12	76.3	0	23	26	133	4	1169.74	0.31	0.08
NODE_645770_length_63_cov_2.000000	12	81.07	0	11	85	86	4	1174.51	0.09	0.13
NODE_251346_length_90_cov_1.033333	12	82.66	136	26	0	20	5	1176.1	0.94	0.04
NODE_517828_length_63_cov_2.000000	12	84.25	0	12	66	104	5	1177.69	0.00	0.02
NODE_91455_length_62_cov_2.048387	12	85.84	32	26	2	122	5	1179.28	0.04	0.01
NODE_720344_length_63_cov_2.000000	12	87.43	0	10	112	60	4	1180.87	0.80	0.29
NODE_213620_length_63_cov_2.000000	12	89.02	0	16	109	57	5	1182.46	0.06	0.04
NODE_266482_length_6	12	90.6	3	30	34	115	5	1184.0	0.00	0.12

3_cov_2.000000		1						5		
NODE_662387_length_63_cov_2.000000	12	92.2	0	14	16	152	5	1185.64	1.47	0.59
NODE_262219_length_63_cov_4.507936	12	93.79	1	23	22	136	5	1187.23	0.03	0.87
NODE_544635_length_63_cov_2.603175	12	95.37	29	25	0	128	5	1188.81	0.14	0.04
NODE_389471_length_63_cov_2.000000	12	96.97	28	22	0	132	4	1190.41	0.96	0.00
NODE_271217_length_31_cov_1.000000	12	98.56	0	79	103	0	5	1192	0.22	1.64