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General Introduction to Results

Thank you for choosing DNA Tribes® Genetic Ancestry Analysis. The results reported below indicate the places your DNA profile is most common in living populations around the world. Your results come in four parts: Autosomal STR Profile, Native Population Match, Global Population Match, and World Region Match.

Part A: Autosomal STR Profile: Your unique genetic profile includes your allele values for 26 genetic markers distributed throughout your autosomal chromosomes. At each locus, you have two values: one allele inherited from your father and one allele inherited from your mother, for a total of 52 dimensions used to compute your geographic ancestry. Values from all 26 marker systems are used to compute population and world region matches.

Part B: Native Population Match: These results list your Top 20 matches in a database of 964 native populations that have experienced minimal movement and admixture in modern history (approximately, the last 500 years). DNA matches do not necessarily suggest a recent family ancestor from each country listed and can express the genetic traces of more ancient relationships between populations through shared origins, migrations, and long term trade contacts in each part of the world. For people with mixed ancestry, DNA matches can also identify populations where similar mixes have taken place (such as native populations located near historical trade and migration routes between continents).

Part C: Global Population Match: These results list your Top 20 matches in a database of 1,255 global populations, including native peoples as well as modern communities that have mixed and/or migrated around the world within the past 500 years. Matches with diasporic populations can express genetic material shared with one or more of the ancestral source populations for that modern ethnic group. For instance, DNA matches in Latin America can express European, Native American, and/or African related ancestry shared with these modern populations. For people of with mixed ancestry, these matches can also include populations where similar mixes have taken place.

Part D: World Region Match: Ancestry from each part of the world is most robustly expressed by your regional DNA match scores in Part D. This comprehensive world region analysis complements more limited Part B - C comparisons to individual samples in our database (typically composed of 100-200 people each). Each of these world regions is a genetic cluster that is the product of long term patterns of migration and settlement over several millennia (predating the formation of modern nationalities).

The highest score indicates your primary geographical affiliation, and subsequent scores indicate secondary regions where your DNA profile can also be found. The regions where your DNA profile is most frequent are mapped as large circles, and other regions are plotted as circles visually scaled according to match scores.

The map on the next page illustrates the world regions distinguished by DNA Tribes® genetic ancestry analysis. World regions each retain genetic characteristics shared with neighboring and genetically related regions. For this reason, individuals with recent family origins from one region can have their strongest affiliation with another nearby region based on where their DNA profile is most frequent.

(Continued next page)

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About DNA Tribes® World Regions

The following pages describe the genetic regions identified in Part D of your report.
Each of these regions is identified on an objective mathematical basis and represents a genetic cluster or group of related populations shaped by historic and prehistoric human interactions.

<u>European and Near Eastern Regions</u>: *This group of related regions, sometimes described as the West Eurasian or "Caucasian" family of regions, includes populations of both Europe and the Near East.*

- **Aegean**: The Aegean Islands, Sardinia, Italian Peninsula, and Lower Danube River.
- **Arabian**: The Arabian Peninsula.
- **Iberian**: The Iberian Peninsula, Pyrenees Mountains, and Balearic Islands.
- **Levantine**: Egypt and Eastern Mediterranean.
- **Mesopotamian**: Anatolia, the Caucasus Mountains, and nearby parts of Western Asia.
- **North African**: Berber and Arabic speaking populations of the Atlas Mountains and Sahara.
- **Northwest European**: The British Isles, Scandinavia, and continental Western Europe.
- **Slavic-Baltic**: Slavic, Baltic, and Uralic speaking populations of Central and Eastern Europe.

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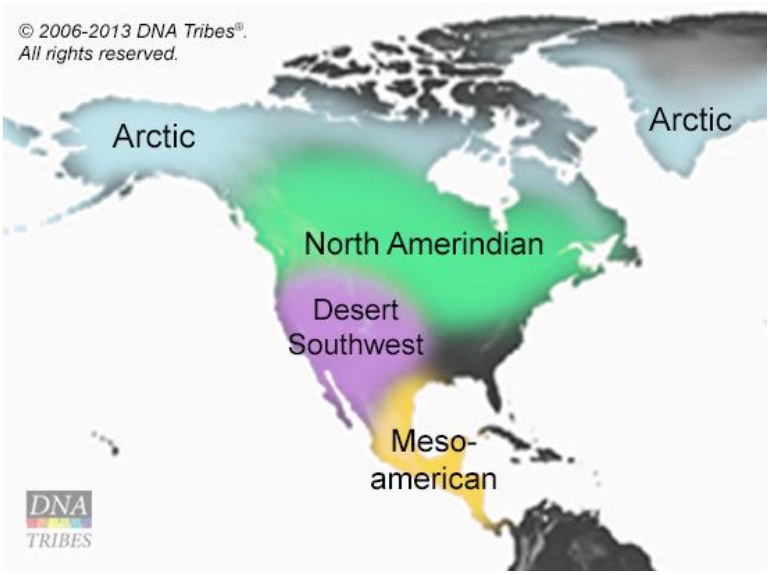

Native North and Central American Regions:

- **Arctic**: Paleo-Siberian, Athabaskan, and Eskimo-Aleut speaking cultures of Far East Siberia, Alaska, and Canada.
- **North Amerindian**: Salishan, Athabaskan, Siouan, and Algonquian speaking cultures of North America.
- **Desert Southwest**: Seri, Athabaskan, and Uto-Aztecan speaking cultures of Oasisamerica, including the Southwestern United States and Western Mexico.
- **Mesoamerican**: Bribri, Mayan, Mixe-Zoque, Oto-Manguean, Purepecha, Totonacan, and Uto-Aztecan speaking populations of Mexico and Central America.

Native South American Regions:

- **Amazonian**: Amazonian: Native cultures of the Amazon River Basin.
- **Andean**: Peoples of the Western South America, including the territories of the historical Inca Empire.
- **Gran Chaco**: Peoples of the Gran Chaco ("Great Hunting Land") of South America.

Modern Populations of Mixed Native American Ancestry: The mixture of Native American ancestry with other ancestry (such as European or African) is expressed in match scores for **Metis-Mestizo** genetic grouping (*not shown*). This mixture is most typical of modern Latin America *Mestizo* ("mixed") cultures that have emerged since the period of European Colonialism, but can also be found in English and French speaking (*Metis*) populations of North America.

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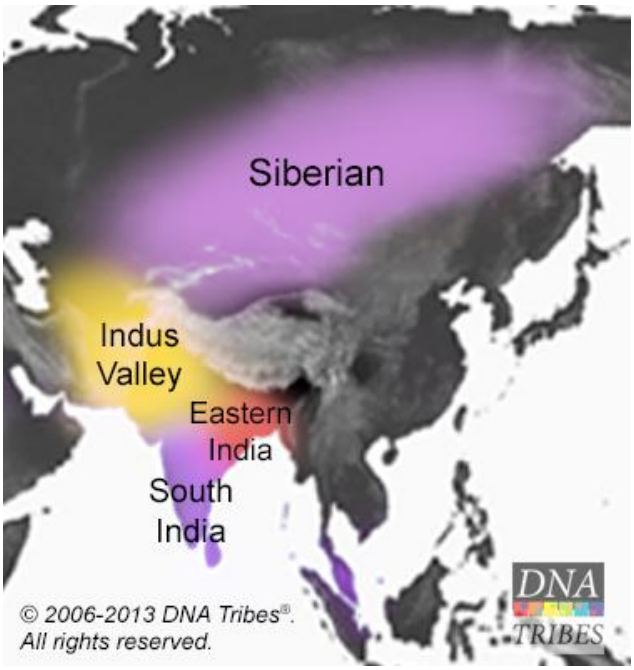
Sub-Saharan African Regions: *This group of related regions includes African populations south of the Sahara Desert.*

- **African Great Lakes:** The Great Lakes region surrounding the Great Rift Valley in eastern Africa.
- **Horn of Africa**: The eastern African lands along the Red Sea and Gulf of Aden that face the Arabian Peninsula.
- **Sahelian**: Populations near Lake Chad and the semi-arid Sahel, home to Sahelian societies that emerged along Trans-Saharan trade routes linking West Africa with the Mediterranean and Near East.
- **Southern African**: Khoisan and Bantu speaking populations of Southern Africa.
- **Tropical West African**: A large region including parts of West Africa facing the Gulf of Guinea and Atlantic Ocean, as well as the Bantu speaking cultures of Southeastern Africa.



Central and South Asian Regions: *Located midway along the land and sea routes connecting East and West, these regions have been contact points for mixture between West Eurasian (European and Near Eastern) and Asian-Pacific cultures since early periods.*

- **Eastern India:** The eastern Indian Subcontinent.
- **Indus Valley**: The Northern Indian Subcontinent and Southern Central Asia, including homelands of the Bronze Age Indus Valley (Harappan) and Oxus (Bactria-Margiana) Civilizations.
- **Siberian:** Indigenous cultures of Siberia, including Turkic, Mongolic, and Tungusic speaking populations living between the Altai Mountains and Lena River.
- **South India**: The southern Indian Subcontinent, including the Dravidian speaking peoples of Tamil Nadu and many other cultures.

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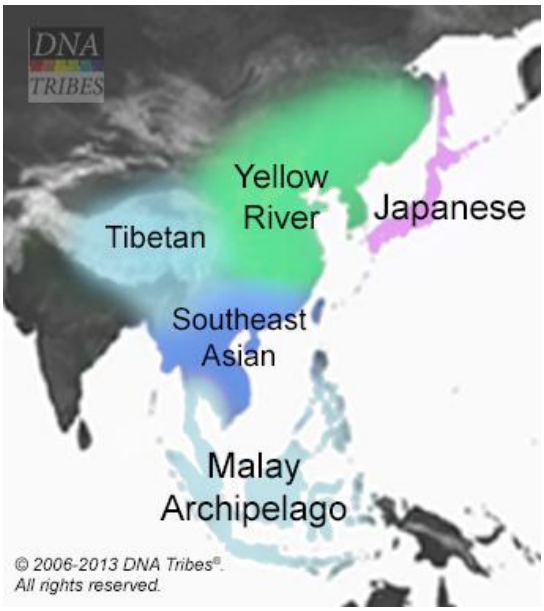

East Asian Regions:

- **Japanese**: The Japanese Archipelago.
- **Malay Archipelago:** Island Southeast Asia, Thailand, and Cambodia.
- **Southeast Asian**: Peoples of Southeast Asia, including peoples of Thailand, Vietnam, and neighboring countries, as well as ethnic groups of southern China.
- **Tibetan**: The region including the Himalayan Mountains and the Tibetan Plateau and extends to the western provinces of modern China.
- **Yellow River**: Han speaking populations of present day China, as well as Koreans and other ethnic groups living near the Yellow and Yangtze Rivers of classical East Asian civilization.

Oceanian Regions: *This vast oceanic region includes two genetic regions only distantly related to continental Eurasian populations.*

- **Australian**: Aboriginal peoples of Australia and Papua New Guinea.
- **Polynesian**: Literally meaning "many islands," this region includes linguistically related populations living in a vast area of the Pacific Ocean encompassing Samoa and New Zealand in the west to Hawaii in the east.

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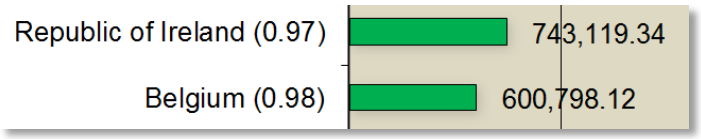
Interpretation of Match Scores: As the example below illustrates, your analysis includes two scores for each ethnic group and world region: (1) your MLI score and (2) your TribeScore.



Above: *Example of score presentation*

MLI (Match Likelihood Index) Scores: listed next to the bar graph for each population, measure how common frequent your DNA profile is in that population as compared to the world overall. **MLI scores locate the ethnic groups and regions where your DNA profile is most common.** For instance, a score of 743,119.34 for the Republic of Ireland *(see example above)* would indicate your total combination of alleles is 743,119.34 times as common in Ireland as in the world. All MLI scores can be compared against each other as **odds ratios**. For instance, if you obtain a score of 743,119.34 for Ireland and 600,798.12 for Belgium, this means your genetic profile is 743,119.34 / 600,798.12 = 1.24 times as likely to be Irish as it is to be Belgian.

TribeScore: Each match also includes a TribeScore in parentheses, listing your MLI score's percentile in that population. **TribeScores compares your MLI scores to members of each ethnic group and world region.** For instance, results listing "Republic of Ireland (0.97)" *(see example above)* would indicate that your MLI score is higher than 97% of scores from this Irish reference population, and lower than 3% of these Irish individuals. TribeScores of (0.05) and above are within the expected genetic range for that population; TribeScores of (0.25) and above are within the typical genetic range for members of that population.

Conclusion: The genetic ancestry analysis below documents genetic ancestry that dates back thousands of years. The information in your report below can complement what you already know about yourself, your family, and your genealogy by putting your ancestry in a global perspective using molecular genetics.

Further Reading: Sample results with commentary on how results can be interpreted are available for several ethnic groups online at: http://dnatribes.com/sampleresults.html

Additional information about the autosomal STR markers listed in Part A of your report can be found online at: http://www.cstl.nist.gov/biotech/strbase/

A global survey using the DNA Tribes® World Region algorithm can be found at: http://dnatribes.com/sample-results/dnatribes-global-survey-july2013.pdf.

Our monthly DNA Tribes® Digest articles provide more detailed analysis of world genetic relationships and are archived online at: http://www.dnatribes.com/library.html

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Part A: Your Genetic Profile

CONFIDENTIAL INFORMATION: Below is your unique genetic profile used to identify your geographical ancestry. Because this profile identifies you personally, DNA Tribes® recommends that you treat the genetic profile on this page as strictly confidential information.

A reference to further information about these genetic markers is listed under Further Reading on Page 6 of this report.

Autosomal STR Profile
Example Latino (Hispanic) Person

Locus	*Allele 1*	*Allele 2*
Amel	X	Y
D3S1358	15	16
TH01	6	7
D21S11	29	30
D18S51	14	17
Penta E	7	12
D5S818	11	12
D13S317	11	12
D7S820	10	11
D16S539	11	12
CSF1PO	11	12
Penta D	9	10
vWA	16	17
D8S1179	13	14
TPOX	8	12
FGA	23	24
D2S1338	17	20
D19S433	13	15
F13A1	3.2	7
F13B	8	9
FES/FPS	10	11
LPL	10	12
D10S1248	13	14
D12S391	18	19
D1S1656	15	16
D22S1045	15	16
D2S441	10	11

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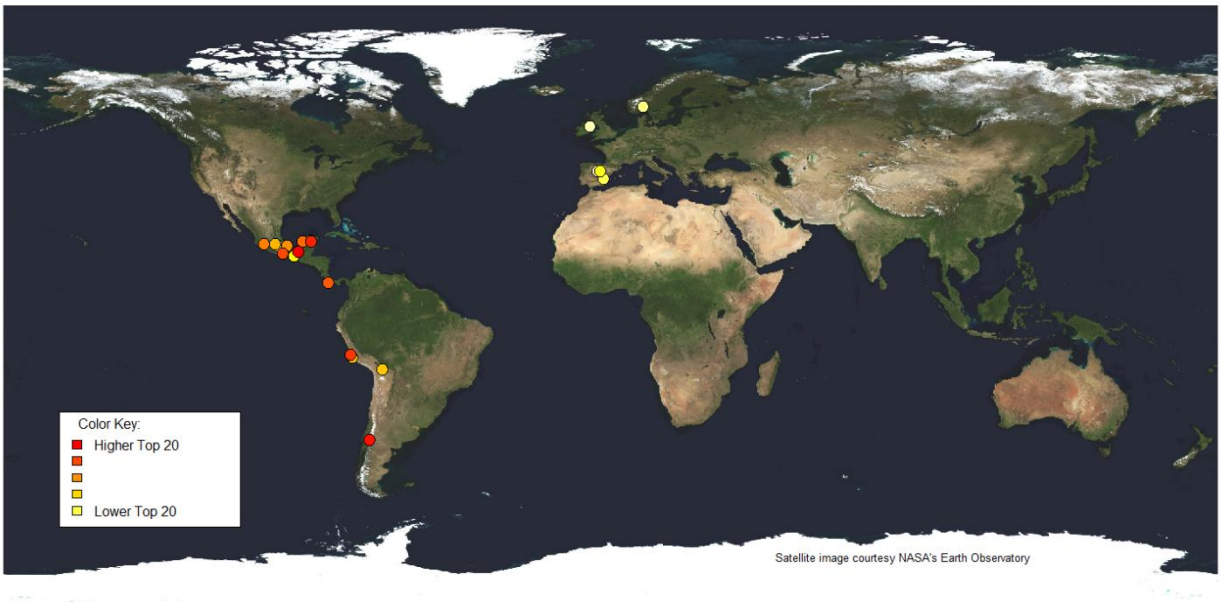
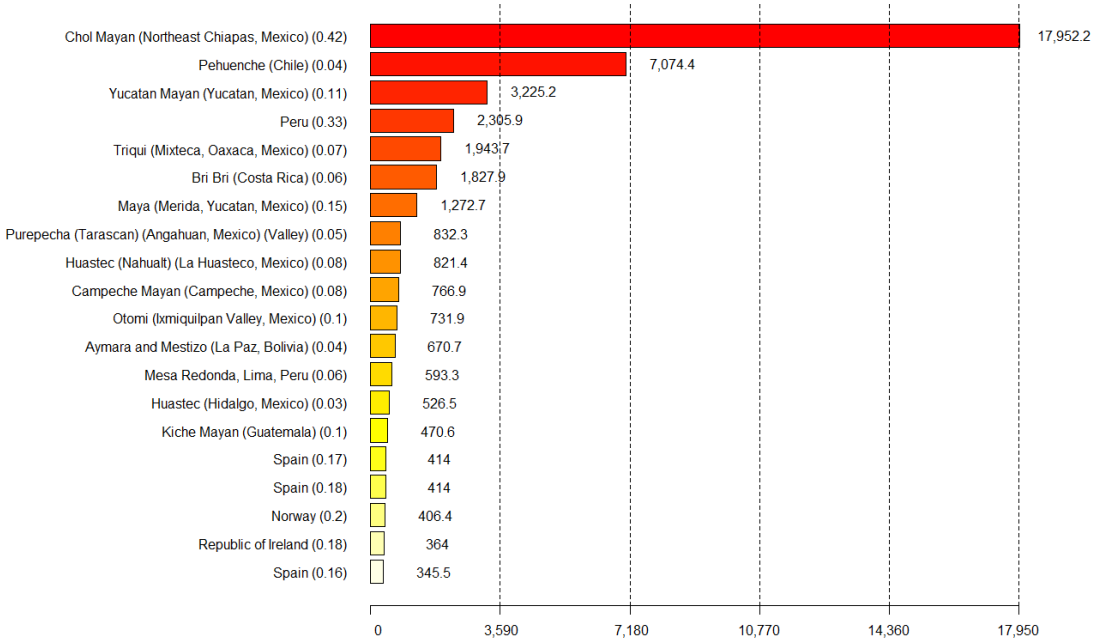
Part B: Your High Resolution Native Population Match Results





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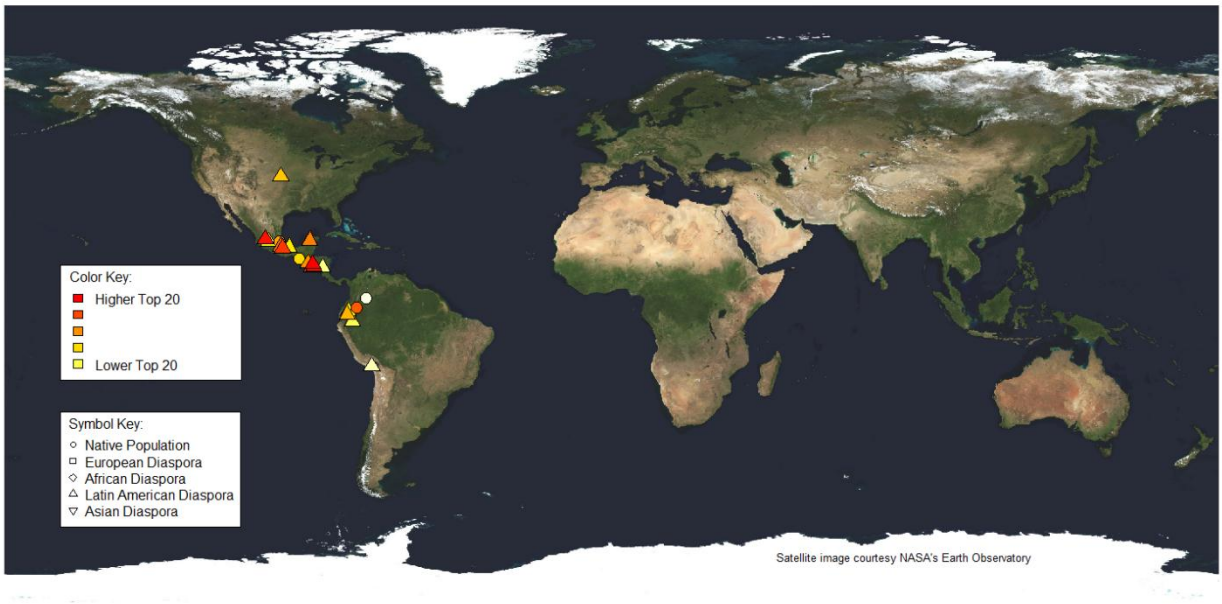
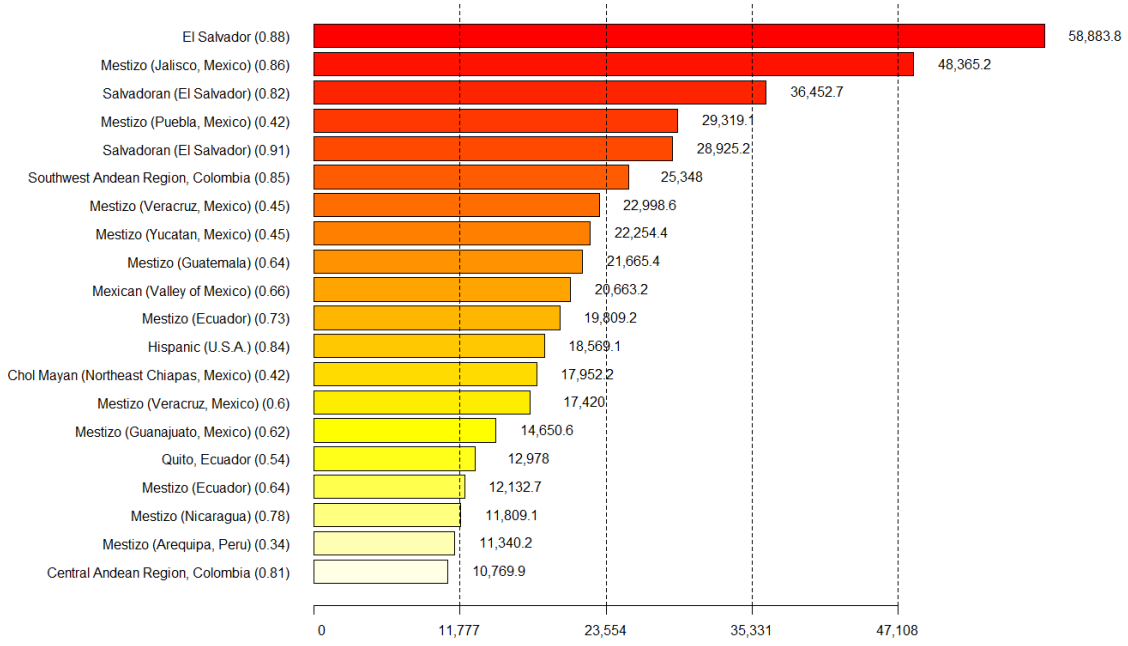
Part C: Your High Resolution Global Population Match Results





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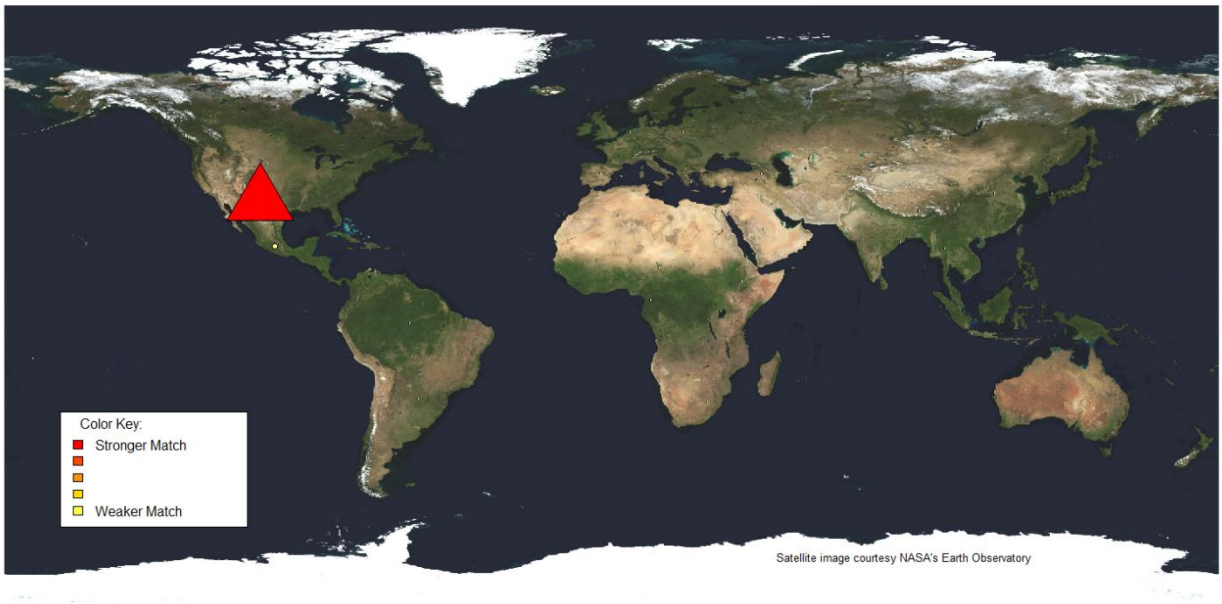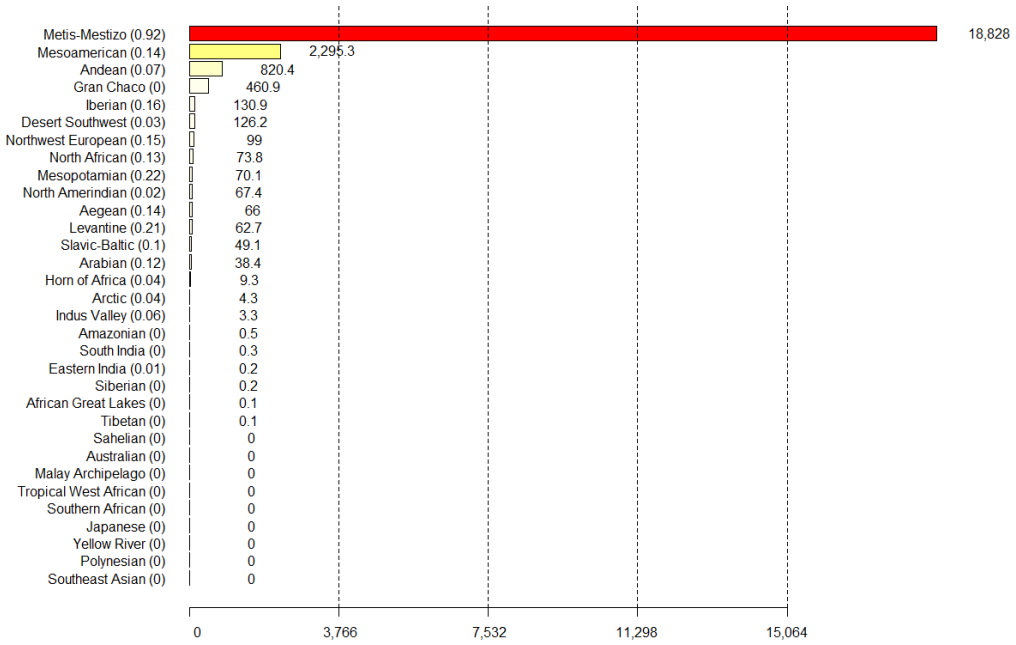
Part D: Your High Resolution World Region Match Results