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# MODELING LARGE-SCALE HISTORICAL MIGRATION PATTERNS USING FAMILY HISTORY RECORDS

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## Introduction

Location has a powerful effect, and humans seek to understand not only where they are, but where they have come from. Thus, genealogy and migration are both important human concepts, and one can help to illuminate the other. Historical migration studies use records of all types to attempt to model and explain the movement of individuals and families.

Our purpose is to use the new FamilySearch database compiled by the Church of Jesus Christ of Latter-day Saints and its members to create a flexible search engine which will enable visualization and analysis of migration by community or by place of origin, and which will explore the dynamics of multigenerational migration.

## Justification & Methods

Historical migration studies are not new, but they have been inherently limited. One of the primary impediments to studying migration is the massive amount of data that must be collected, and which still only covers narrowly defined times and locations. The results are still valuable, but being difficult to obtain, analyses are constrained and inflexible. This tool will instead utilize the collaborative possibilities of the new FamilySearch to create a dynamic framework in which time and location are not limits, but parameters. By utilizing this massive database queried for specific places and years, powerful analyses are possible on almost any scale, something not previously feasible. The implementation of this system is done by accessing the API for new.familysearch.org through an internet application that we wrote specifically for this research.

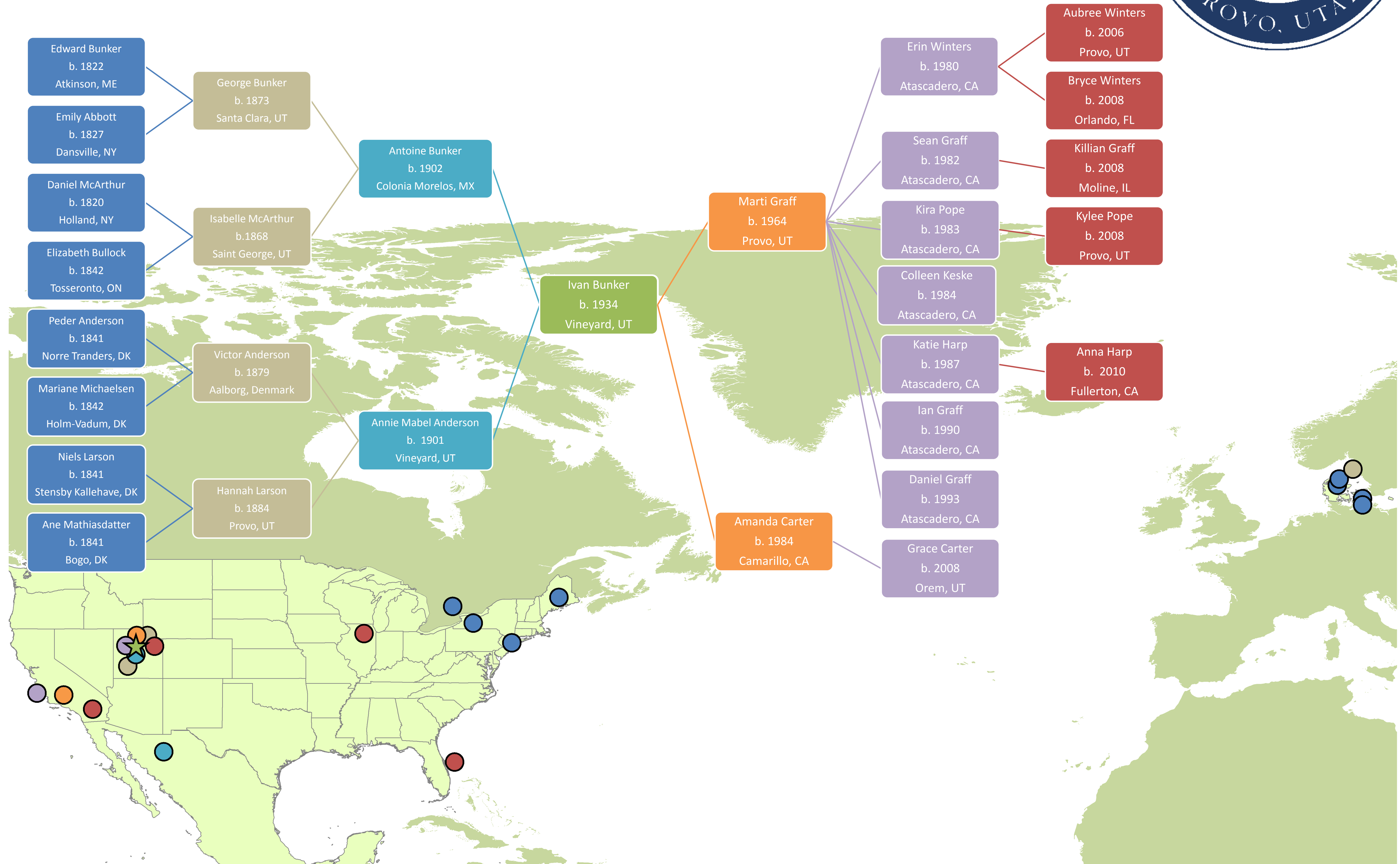
## Example Results

Every person with offspring can be represented in a multigenerational chart in both directions. This primary individual (the "root") has both progenitors and progeny, with themselves in the middle. Our web search application will identify a root individual in the FamilySearch database, and then use available data to extrapolate out an "individual identity hourglass" (see Family Tree). Each of these individuals has an associated birthplace and date; this data allows the construction of a family migration profile. This information can be mapped and analyzed to determine mean migration distances and centers and paths of family movements (see Map).

However, people have long traced their individual families; the real power of this tool is in community analysis. Communities consist of many individuals, each with their individual identity hourglass. This method makes the following available for an example town:

- We query FamilySearch for all individuals born in Sutter Creek, CA in 1890
- The parents of these individuals are automatically run through a search, compiling historical family information
- The mean center of distribution for each generation and average distance moved for the community are calculated
  - Parents who had children at Sutter Creek in 1890 moved an average of 2796 mi and had a mean center of 43.11 deg north, 61.49 deg west, which is off Nova Scotia because some people came from Europe, while some were from the US. Standard distance of the mean center of parent birthplaces is 2782 mi, which shows their high level of spatial dispersion. Mapping of the data points will improve the interpretation of the statistical results.
- Movement of the original generation can be calculated as the difference between birth and death places.
  - Individuals born in Sutter Creek died an average of 1259 mi from Sutter Creek.

In this manner, information collected with our platform will be used to study individual heritages, family dispersion, and community structures.



## Data Issues

There are some inherent limitations to this project. The FamilySearch database is focused on helping people find and record information on specific ancestors instead of people in specific places and times. Additionally, the database is in a constant state of flux as new data are added by users, and old data are edited, which is indicative of inherent inaccuracies of the data. However, accuracy and quality are being improved through this process.

## Conclusions

We are making steady progress on the search application. The ancestry side of the hourglass has basic functionality and the descendant side is planned. Technical barriers have been addressed, though some challenges remain. We are now moving on to aggregating multiple generations which will allow us to trace spatial patterns of large scale migration over long time periods.

Even in this development stage, this tool provides a very useful framework in which to do migration studies. It helps to overcome the limited nature of most historical migration data, and will allow for new and innovative approaches to the study of population movements, both large and small.