Agriculture Transitions:
Studying Water and Land-Use Change in Idaho's Treasure Valley
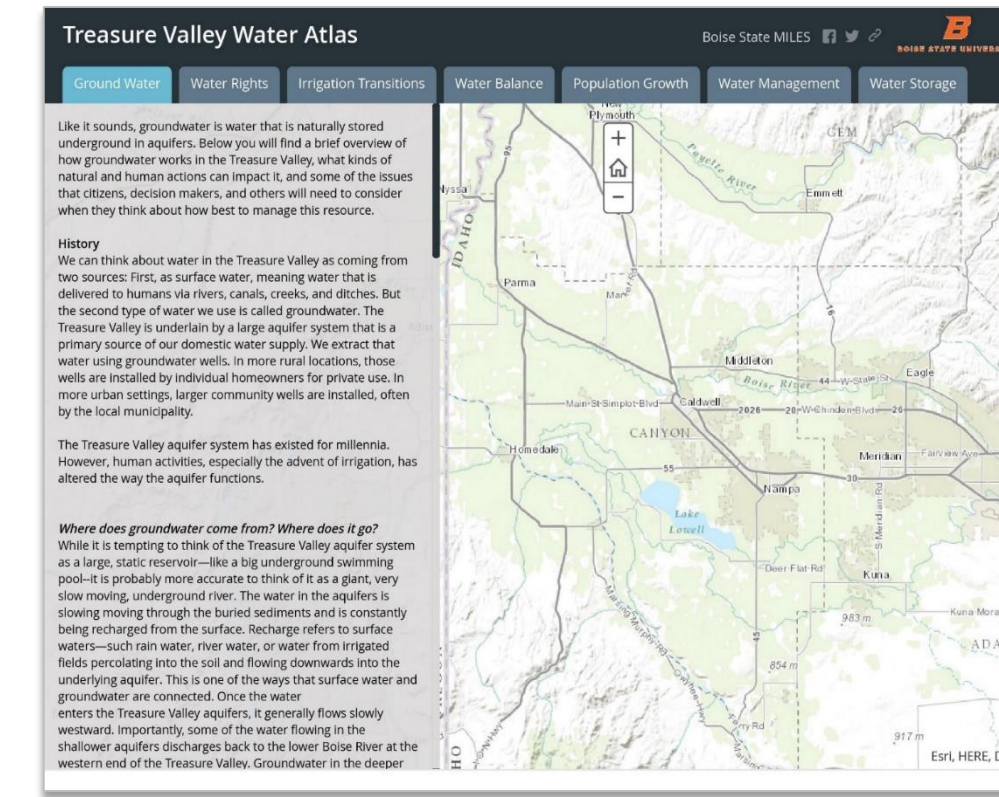
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Abstract

The Treasure Valley is growing and facing new and increasing pressures on water and agricultural land. In order to understand the dynamics of pressures such as population growth and climatic events on agricultural land and water in this region, we are using interdisciplinary techniques to gather data. Along with partners, I am conducting two individual but related studies looking at farmland transitions and water management in the Treasure Valley. We are combining biophysical data with qualitative and quantitative social science data in order to get a holistic picture of land and water use in the Treasure Valley.

Water Management System

Project Overview:
Understanding how water moves in the Treasure Valley, both physically and conceptually, requires input from many different fields. This interdisciplinary study is using data oriented modeling that combines geospatial, biophysical and human dimensions, and coupling it with primary qualitative data that looks at management of the physical water system. While working closely with the biophysical team, my work mainly focuses on the qualitative approach. We know many decisions regarding agricultural water in the Treasure Valley require some degree of local expert knowledge. Through interviews we are tapping into this knowledge to get a better understanding of how the Treasure Valley water management system works and what kind of internal and external pressures it faces.

Methods:
We are currently conducting in depth interviews with farmers, irrigation distributers, federal agencies, environmental lawyers, water consultants, and non-profit organizations. These semi-structured interviews last approximately one to one and a half hours and touch on topics including water management, water rights, storage rights, perceived pressures, climatic impacts, and system shocks.
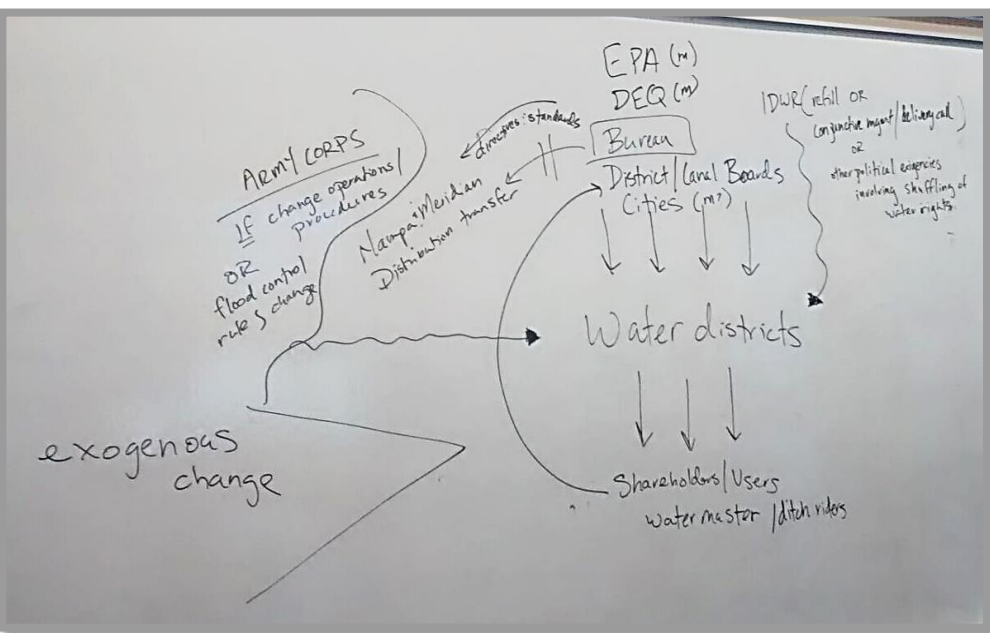
In addition to interviews, we have also had several site visits and focus groups. Site visits allow researchers to become familiar with farms and terminology, while focus groups have been used to explore power structures of the Treasure Valley water system through mapping exercises.
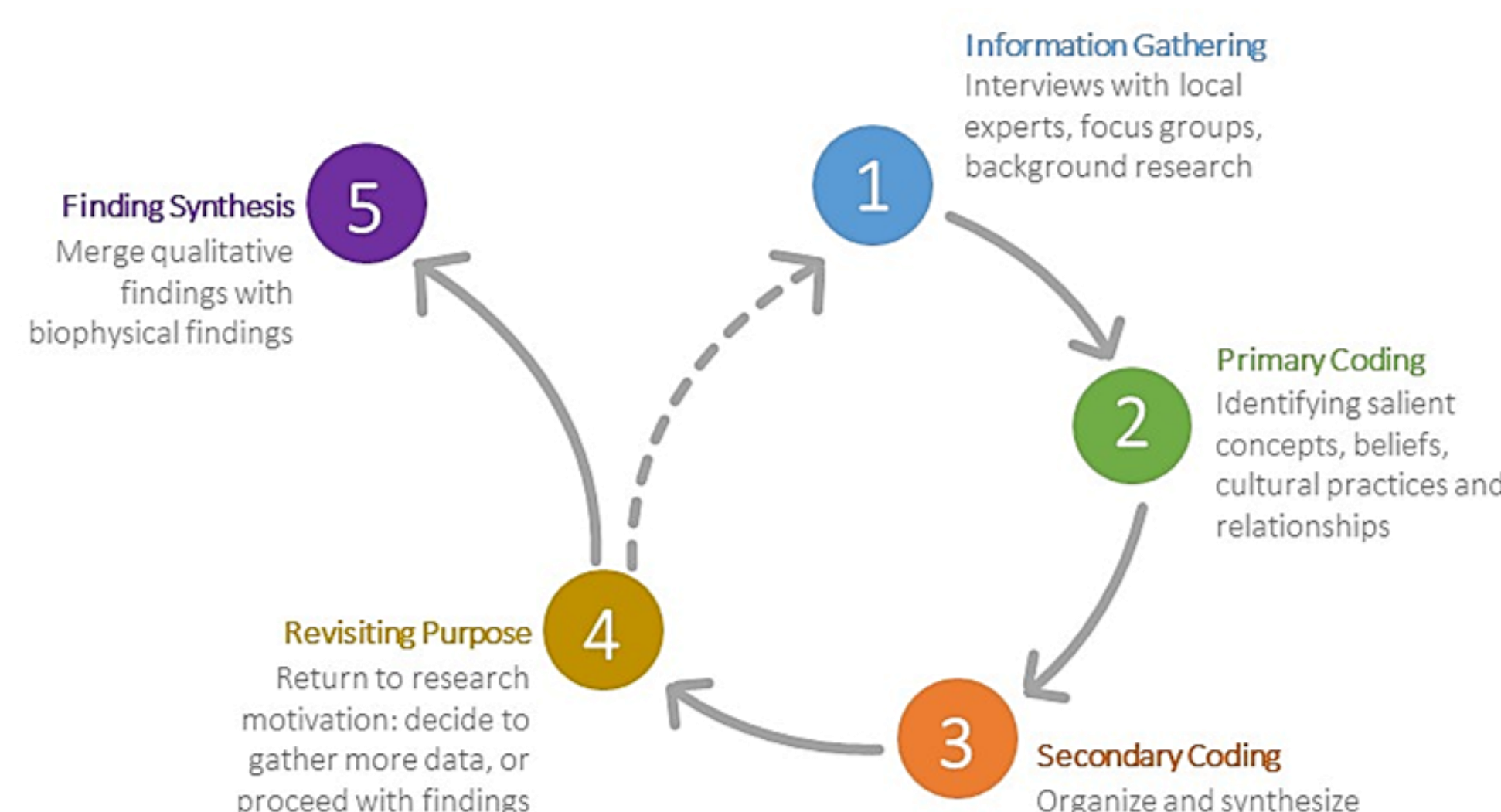
Analysis:
An iterative approach will be used to analyze interview data. This type of approach encourages reflection on current literature, project priorities, and theory. As illustrated in the diagram on the right, through this process data will be reviewed, coded, revisited, and finally compared with the biophysical data being produced by other team members to produce a holistic model of the Treasure Valley water management system.

1 Information Gathering
Interviews with local experts, focus groups, background research

2 Primary Coding
Identifying salient concepts, beliefs, cultural practices and relationships

3 Secondary Coding
Organize and synthesize codes into concepts

4 Revisiting Purpose
Return to research motivation: decide to gather more data, or proceed with findings

5 Finding Synthesis
Merge qualitative findings with biophysical findings

Treasure Valley Water Atlas

Using the information collected through in-depth interviews, we are creating the Treasure Valley Water Atlas (TVWA), a conceptual map of how water for agriculture is managed in our basin. The atlas will cover topics related to water including water law, storage, balance, management, irrigation techniques, and adaptations to pressures such as population growth and climate change. One of the main goals of this project is to create two-way communication between the researchers and the local stakeholders. We are in the process of developing this web-based resource providing:

- Inventory of what we have learned through interviews and focus groups
- Conceptual map of Treasure Valley water system and management
- Biophysical and social science data
- Forum for discussion

Informed by the knowledge that local experts are sharing with us, this one-stop resource will highlight the issues which are at the forefront of water management in this region. Analysis indicates these topics include water rights, irrigation practices, and water storage.
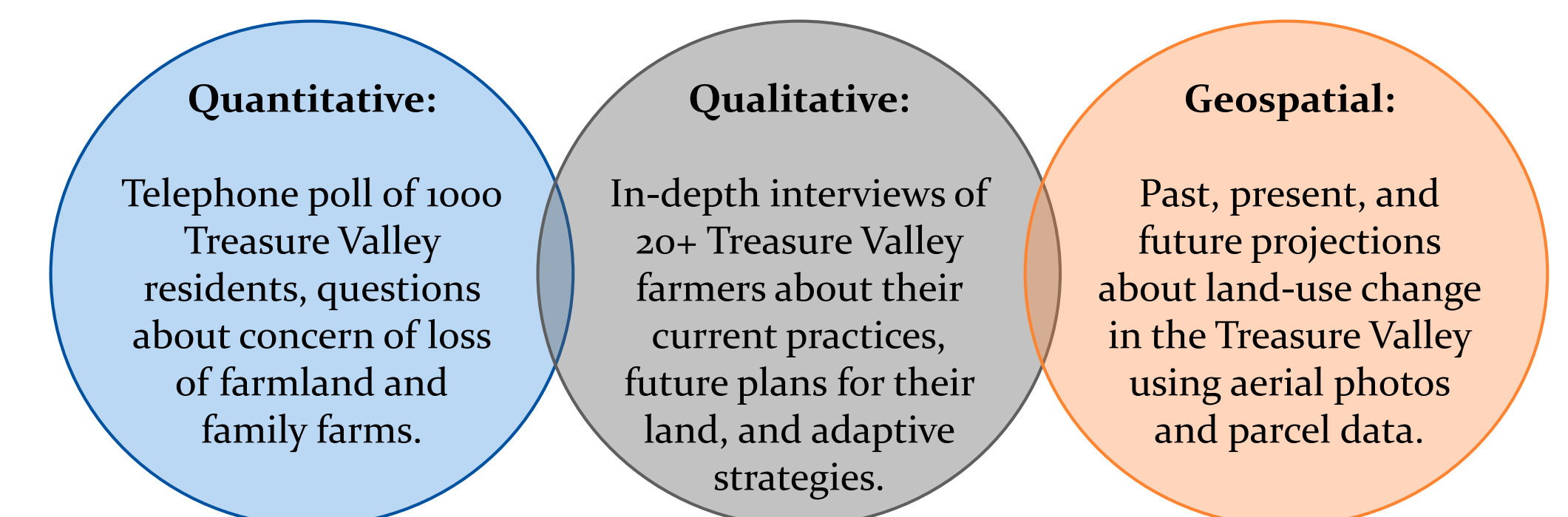
Many words and topics come up repeatedly during the interviews. A quick look at these words show emerging trends on the minds of our water experts.

Preliminary Findings:
While we are still in the initial phases of information gathering and primary coding (steps 1 and 2 in the diagram to the left), we are already seeing some preliminary trends emerging from the interviews. Many of the trends are positive and show the multiple strengths of the water system in the Treasure Valley. Some of the strengths that are apparent are:

- High functioning system under current conditions
- Decades of experience and innate knowledge among managers and operators
- Strong relationships between growers and irrigation operator

But initial analysis of interview data also shows some system weaknesses:

- Closed system: some stakeholders, citizens, and groups not adequately represented
- Heavy reliance on historic data
- Functions most effectively in water-abundant scenarios--vulnerable to multi-year shortages
- Significant jurisdictional compartmentalization (lack of systems thinking and communication across scales)

As we move forward into secondary coding where we start to organize and synthesize these concepts, we will revisit the idea of creating a theoretical model of how social factors move water through the Treasure Valley, and we will likely conduct more interviews or focus groups to refine and add depth to our first findings before finding synthesis with the biophysical data. Eventually the findings from our discussions with local water experts will be used to inform a website: The Treasure Valley Water Atlas.

Farmland Transitions

Project Overview:
Urbanization and climate change are two factors that are putting increasing pressures on land-use around the world, including in the Treasure Valley. Across the globe we are seeing agricultural land competing with varying interests including housing, recreation, business, and infrastructure. This can lead to a loss of agricultural land, or spark structural changes and adaptations in order for farms to maintain their success at the rural urban interface. In the face of these pressures, we want to know how farmland in the Treasure Valley is valued by locals, how farmers are adapting to pressures, and if current and future development match the values of the people in the Treasure Valley when it comes to agricultural land.

Research Questions:
1) **How concerned are people about the loss of ag land in the Treasure Valley?**
    How does this relate to historic, current and projected land use in the region?
2) **How concerned are people about the loss of family farms because of urban growth in the Treasure Valley?**
    How concerned are farmers about urban growth in the Treasure Valley?
    How does this influence farmers' future plans, such as plans for future generations in farming?
3) **How concerned are farmers with climate change?**
    Is this influencing their future land use plans?
    What adaption strategies are they considering? Or have they implemented?

Methods:

Quantitative:
Telephone poll of 1000 Treasure Valley residents, questions about concern of loss of farmland and family farms.

Qualitative:
In-depth interviews of 20+ Treasure Valley farmers about their current practices, future plans for their land, and adaptive strategies.

Geospatial:
Past, present, and future projections about land-use change in the Treasure Valley using aerial photos and parcel data.

Preliminary Findings:
While still in the very early stages of project planning and data collection, we do have preliminary survey results from our quantitative survey. Results indicate that locals are concerned about the decline of family farmers and would rather see farmland preserved than see new housing developments. They also said that agriculture is the most important economic sector of the Treasure Valley, despite the fact that it is actually one of the lower economic drivers in the region. These results indicate that residents still see agriculture as part of the identity of the Treasure Valley. When we look at the initial findings of our geospatial data however, we do not see these values reflected as projections of future land-use in the Treasure Valley show farmland rapidly being urbanized and not preserved.
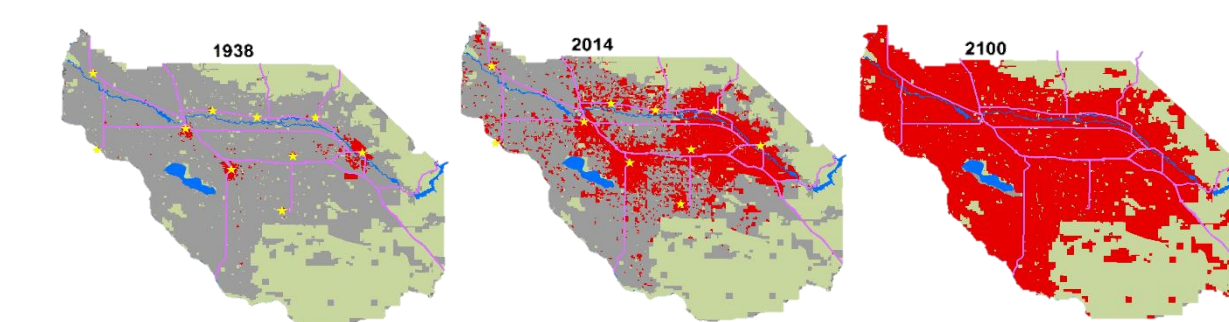
Past, present, and future projections of land-use in the Treasure Valley under a "business as usual" scenario.

Acknowledgements

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