**The Evergreen State College**

**Graduate Program on the Environment**

### Thesis Prospectus

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**STUDENT AGREEMENT:**

**SIGNATURE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ DATE\_\_1/10/2020\_\_\_\_\_\_**

**FACULTY READER APPROVAL:**

**SIGNATURE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ DATE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**MES DIRECTOR APPROVAL:**

**SIGNATURE:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ DATE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. Provide the working title of your thesis[[1]](#endnote-1).

Environmental Justice of Safe Drinking Water to Underrepresented Communities in Stanislaus County
2. In 250 words or less, summarize the key background information needed to understand your research problem and question.

Stanislaus County, located in the Central Valley of California, makes a good area for research into issues of safe drinking water because of the large amount of agriculture. This area has many dairy farms that have the potential to leach nitrate into the ground and water supplies. Some of the highest nitrate levels in the state occur in the Valley (Balazs, 2011). There is a high incidence of cancer in this area as well. Although there are several causes of cancer, I want to look at whether toxic drinking water is a factor. Unsafe drinking water is a very common occurrence to those living in the Central Valley and very little has been done by the state to remedy this issue. Many residents in this area receive letters in the mail from their water suppliers with a warning about high levels of toxins in their water. These letters state to not worry because the health effects from nitrate exposure are not immediately apparent, they emerge over time. In addition, the Valley also contains the largest populations of Latinos in the state according to the U.S. Census (Balazs, 2011). This raises questions of environmental justice: why do Latino and people of color communities bear a disproportionate burden of the use of nitrates from agriculture in California?
3. State your research question.

What is the spatial relationship between poor water quality, disadvantaged communities and negative health trends in Stanislaus County, California?
4. Situate your research problem within the relevant literature. What is the theoretical and/or practical framework of your research problem?

The theoretical framework will be literature on environmental justice. I will be pulling information from a few different articles about environmental justice, injustice, and the origins (Huang & London, 2012; Lewis, 2012; Pellow, 2000). I will also be looking at articles pertaining to justice for clean water (J. K. London, Zagofsky, Huang, & Saklar, 2011; Pannu, 2012). Literature about health hazards of drinking water will be used (Bhowmik et al., 2015; Suthar, 2011; Ward et al., 2018). Many case stories are not from the United States although other countries exist that are suffering from the same issues. Literature on the history of Stanislaus County will be vital background information. The area has a history of issues with agriculture and the water system that will be important for my thesis.
I will use GIS as the practical framework. The process of creating layers and adding symbology will help me recognize and learn trends for Stanislaus County and provide a display of the issues that I will find. Also, interviewing health officials and policymakers along with environmental justice and water quality experts to obtain their ideas on the matter will help me get a bigger picture of the opinions and thoughts going on in the area about unhealthy drinking water.
5. Explain the significance of this research problem. Why is this research important? What are the potential contributions of your work? How might your work advance scholarship?

This research is important because it focuses on human health for disadvantaged communities in an underrepresented geographic region. The research that I will be doing focuses on an area of California that analyzes the relationship between the distribution of safe drinking water and the health effects of having toxic water. Most of the heavy metals and nitrates in water cause health problems such as cancer and birth defects (Ward et al., 2018). I want to focus mostly on disadvantaged communities, specifically ones that are lower income or people of color since I hypothesize, they are the ones being harmed the most. I believe supporting these minority communities are important for social justice and equality that should be available to everyone. I would like the results of my study to support the research done by UC Davis Center for Regional Change by coming to the same conclusions. That organization is pushing the state to make change to help the communities that are impacted the most.
6. Summarize your study design[[2]](#endnote-2). If applicable, identify the key variables in your study. What is their relationship to each other? For example, which variables are you considering as independent (explanatory) and dependent (response)?

The key variables in my study are water quality parameters such as concentrations of nitrates and nitrites, turbidity, pH, and organoleptic parameters. Demographic data will include what racial/ethnic group individuals belong to or identify with, and their family income level. Health variables, like rates of cancer or birth defects, will also be used. I will be looking at demographic data variables as related to the water quality and health variables compared within the different demographics in Stanislaus County. I will be using spatial analysis to identify trends and whether the variables are correlated.
I will be conducting interviews. The comparison between the two different groups of individuals being interviewed will show the priorities and major environmental issues being addressed or ones that should be addressed in the county. I will interview members of the Board of Supervisors for Stanislaus County, members with the Community Service District in Denair, and those involved with the California State Water Resources Control Board. These individuals will represent the government officials that are making changes and spending the budget for the county. I will also interview members involved in the UC Davis Center for Regional Change. These individuals are ones that are pushing for environmental justice in the Central Valley. I will interview a hydrogeologist that works in the Central Valley as well. A research associate with the Cancer Registry of Greater California will be included. This group will represent experts and academics in the area of water quality and environmental justice.
7. Describe the data that will be the foundation of your thesis. Will you use existing data, or gather new data (or both)? Describe the process of acquiring or collecting data[[3]](#endnote-3).

I will be using existing data for my project. I will get water data from the California State Water Resources Control Board. Locations of dairy farms in Stanislaus County are accessible by the USDA and California Department of Food and Agriculture. Demographic data can easily be located through GIS via the ESRI Living Atlas. I will also look at demographic data through the American Community Survey. California Cancer data could be found through the California Cancer Registry. Other health data can be found through California Department of Public Health. Most of this data can be done with some research online, however, I may have to contact some organizations to get more detailed data. I will also ask UC Davis Center for Regional Change for any reports they have done that has relevant data. My goal is to find data from about twenty years ago to compare to current data to do a temporal analysis.
8. Summarize your methods of data analysis. If applicable, discuss specific techniques that you will use to understand the relationships between variables (e.g., interview coding, cost-benefit analysis, specific statistical analyses, spatial analysis) and the steps and tools (e.g., lab equipment, software) that you will take to complete your analyses.

Most of my data analysis will be done through GIS. I will have to make several different map layers to overlay on a base map. The layers that will be included are water sources, race, income, locations of dairy farms, incidences of cancer, and potentially other health problems that seem prominent in Stanislaus County. Each layer will be a polygon with different symbology. Each shapefile will have numerical data that is relevant to that layer.
I would also like to conduct a few interviews with Health Officials and experts or professors that have studied this issue and would need to learn how to do interview coding.
9. Address the ethical issues raised by your thesis work. Include issues such as risks to anyone involved in the research, as well as specific people or groups that might benefit from or be harmed by your thesis work, perhaps depending on your results. List any specific reviews you must complete first (e.g., Human Subjects Review or Animal Use Protocol Form), and specific permits or permissions you need to obtain before you begin collecting data (e.g. landowner permissions, agency permits).

I will take an environmental justice perspective on this thesis in hopes to benefit the communities in the Stanislaus County area. I will examine the relationship between unsafe drinking water and disadvantaged communities, specifically low income and minority groups. If there is a correlation and that is why health patterns are worse in these populations, it will raise awareness to the county and state to be more proactive in protecting these communities. If there is no correlation, the low income and minority groups should not be excluded from environmental justice. Other environmental harms, such as air pollution, could be causing health risks to these communities and more research should be done.
I will fill out a Human Subjects Review since I plan to include interviews in my thesis project. I am interviewing Health and Board Officials in the area to hear their perspective on the topic. I am also interviewing experts in the field of environmental justice who have been doing continuing research in the Central Valley.

Most of the data that I will be using has open access from the state of California so I do not believe that I will need to obtain any specific permits or permissions for data gathering. There may be some data that I will request from agencies, but most of the data should be accessible to the general public.

1. Reflect on how your positionality as a researcher could affect your results and how you will account for this in the research process[[4]](#endnote-4).

I am already biased because I am researching an area in which I grew up. Water quality has always been an issue that I was aware of growing up and it was not only a health concern but also a financial concern. I was raised by a low-income family and both of my parents are people of color. My parents paid for running water in our household, but also bought several gallons of filtered water to drink and cook with. Already having a small budget to work with, this financial burden made other aspects of life even harder. I never knew if families of different demographics were struggling in the same ways we were.
I am hoping to find patterns between poor water quality and negative health trends. This will provide a correlation to bring the issue of unsafe drinking water to the attention of government officials. If more funding can be set aside to aid in filtering drinking water, this could potentially improve lives of those in Stanislaus County. Many families living in this rural area cannot afford the costs of clean drinking water and attention needs to be brought to these areas so assistance can be enforced. With the availability of clean drinking water, the health of these communities could potentially be improved.

I know what I want my conclusion to be, but I am going to have to be objective throughout this entire process in order to not sway my results from the data that I find. I want there to be a clear result to make my point on environmental and spatial justice concrete, but I must remind myself that clear results are not always the case.

The important thing for me to remember throughout this process is that I am doing this project to do research and to find facts, not to just impose my opinion on the matter.

1. Provide at least a rough estimate of the costs associated with conducting your research.  Provide details about each budget item so that the breakdown of the final cost is clear.

There is a potential travel cost associated with my research. I am doing numerous interviews and although several can be done over the phone, I would like to travel to the area to meet officials and experts on water quality and environmental justice. I want to have in person interactions to see who these individuals are and what their opinions are on the topic.

An average roundtrip flight cost would be around $130.
A car rental would be $25 per day and I estimate to be there for around 8 days, totaling $200.

Some individuals I want to interview are based out of UC Davis, and the board meetings I would like to attend in order to meet some board members are in Modesto and Denair. The distance between UC Davis and Modesto is approximately 90 miles and gas costs around $3 a gallon currently. With a roundtrip visit, gas will cost around $30. I estimate 3 roundtrip visits between the two cities to conduct all my interviews.

The total trip to visit different cities to meet with different individuals will cost $420.

1. Provide a detailed working outline of your thesis.

Abstract
Introduction- Why Stanislaus County makes a good case study for unsafe drinking water for disadvantaged communities
Literature Review- Poor water quality and the health implications
 Guidelines set to support safe drinking water
 Agriculture contributing to contamination of drinking water
 Environmental Justice and Injustice
 People of color living in the Central Valley-why they are a targeted demographic
Methods- Analysis of Stanislaus County include geography and statistics
 Methodology used to create GIS StoryMap
 Interview coding
Results- Spatial Analysis of the GIS maps
 Numerical data that was found on the variables (water quality, dairy farms, health statistics, demographics)
 Interview interpretations/coding
Discussion- Is there a correlation between high nitrates in the drinking water potentially due to dairy farm leaching and is it negatively impacting certain communities?
 What policies or actions can be put into place to change the negative impacts of unsafe drinking water
Conclusion
2. Provide a specific work plan and a timeline for each of the major tasks in the work plan. Be as realistic as you can, even though you will probably need to alter this schedule as you complete the tasks. Remember that faculty readers take time to return your drafts and that the final polishing and formatting of your thesis for binding will take longer than you ever imagined.

December 2019- Write Literature Review
Fill out paperwork for human subjects review
January 2019- Conduct Interviews
Collect Data Needed
Write Introduction
Start GIS StoryMap
February 2019- Continue working on GIS StoryMap
Write Materials and Methods section
Write Results section
March 2019- Write Discussion
Write Conclusion
Write Abstract
April 2019- Have completed draft of thesis done
Do final edits
3. Who, beyond your MES faculty reader, will support your thesis? Indicate support both within and outside of Evergreen. Be specific about who they are and in what capacity they will support your thesis. If you are working with an outside agency or expert, be specific about their expectations for your data analysis or publication of results.

I would like to work with UC Davis Center for Regional Change. They have several faculty and research analysts that have data and experience with working with this topic. UC Davis also has a Human Ecology Department and I would like to contact some of the faculty working there. Since they are working in the area I would like to study, I think they would have good insights for my environmental justice perspective. I would also like to work in depth with Mike Ruth. He is a wonderful resource when it comes to GIS spatial analysis as well as his creativity when it comes to composing layers.
4. List the 3-5 most important references you have used to a) identify the specific questions and context of your topic, b) help with issues of research design and analysis, and c) provide a basis for interpretation. For each reference, explain how your project specifically connects to the source by extending, challenging, or responding to the conclusions, methods, or implications.

“Just Water? Social Disparities and Drinking Water Quality in California’s San Joaquin Valley” (Balazs, 2011) is the most relevant paper I have found regarding my topic. The author was looking at the same variables that I will be looking at in my thesis and it includes important background information that I will need. The results of this study may support the result of my hypothesis since they found that Latinos in the San Joaquin Valley may be exposed to higher levels of nitrates than other communities. This research will be a good start to mine, however, I would also like to look at health trends occurring in the area.
“The Struggle for Water Justice in California’s San Joaquin Valley: A Focus on Disadvantaged Unincorporated Communities” (J. London et al., 2018) is another reference that I will be relying heavily on. This report was done by the UC Davis Center for Regional Change and they do work providing environmental justice to areas in the Central Valley. This report includes trends of water systems and disadvantaged communities which will be beneficial when it comes to creating my GIS spatial layers. The report also includes background information about the history of disadvantaged communities in the valley and at the end, it includes policies that have or should be put into place. The UC Davis Center for Regional Change is made up of a team of individuals that are highly versed in this area, and I would like to work with them as part of my thesis.
“Drinking Water Nitrate and Human Health: An Updated Review” (Ward et al., 2018) is the third article that I will be referencing throughout my thesis. Although there is research done on nitrates in the water in the Central Valley and what communities are being affected by it, I have not seen much research that also mentions in depth about the negative health effects and trends. High nitrates in water is stated in literature in many third world countries but it is rare to see it as a prominent issue, especially in the United States. This article cites the ways that nitrates are harmful to the human body and what the negative consequences are. I plan on using this data as the basis for what health hazards I should be looking at when I start looking at trends.

Bibliography

Balazs, C. L. (2011). Just Water? Social Disparities and Drinking Water Quality in California’s San Joaquin Valley. *ProQuest Dissertations and Theses*, 142. Retrieved from http://sfx.scholarsportal.info/guelph/docview/1526000633?accountid=11233%5Cnhttp://sfx.scholarsportal.info/guelph?url\_ver=Z39.88-2004&rft\_val\_fmt=info:ofi/fmt:kev:mtx:dissertation&genre=dissertations+%26+theses&sid=ProQ:ProQuest+Dissertations+%26+Theses+A

Bhowmik, A. K., Alamdar, A., Katsoyiannis, I., Shen, H., Ali, N., Ali, S. M., … Eqani, S. A. M. A. S. (2015). Mapping human health risks from exposure to trace metal contamination of drinking water sources in Pakistan. *Science of the Total Environment*, *538*, 306–316. https://doi.org/10.1016/j.scitotenv.2015.08.069

Huang, G., & London, J. K. (2012). *Cumulative Environmental Vulnerability and Environmental Justice in California ’ s San Joaquin Valley*. 1593–1608. https://doi.org/10.3390/ijerph9051593

Lewis, B. (2012). *Human Rights and Environmental Wrongs : Achieving Environmental Justice through Human Rights Law*. *1*(1), 65–73.

London, J., Fencl, A., Watt, S., Jarin, J., Aranda, A., King, A., … Nguyen, P. (2018). *The Struggle for Water Justice in California’s San Joaquin Valley: A Focus on Disadvantaged Unincorporated Communities Executive Summary*. (February). Retrieved from https://ucdcrc.sf.ucdavis.edu/sites/g/files/dgvnsk986/files/inline-files/The Struggle for Water Justice EXEC SUMM\_1.pdf

London, J. K., Zagofsky, T. M., Huang, G., & Saklar, J. (2011). Collaboration, Participation and Technology. *Gateways: International Journal of Community Research & Engagement*, *4*(1), 12–30. Retrieved from https://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=70138700&site=ehost-live&scope=site

Pannu, C. (2012). Drinking water and exclusion: A case study from California’s Central Valley. *California Law Review*, *100*(1), 223–268.

Pellow, D. N. (2000). Environmental Inequality Formation: Toward a Theory of Environmental Injustice. *American Behavioral Scientist*, *43*(4), 581–601. https://doi.org/10.1177/0002764200043004004

Suthar, S. (2011). Contaminated drinking water and rural health perspectives in Rajasthan, India: An overview of recent case studies. *Environmental Monitoring and Assessment*, *173*(1–4), 837–849. https://doi.org/10.1007/s10661-010-1427-2

Ward, M. H., Jones, R. R., Brender, J. D., de Kok, T. M., Weyer, P. J., Nolan, B. T., … van Breda, S. G. (2018). Drinking water nitrate and human health: An updated review. *International Journal of Environmental Research and Public Health*, *15*(7), 1–31. https://doi.org/10.3390/ijerph15071557

1. You are not locked into this title; its purpose is to help you identify the main point or topic of your thesis at an early stage. [↑](#endnote-ref-1)
2. You might discuss selection of case studies, sampling methods, experimental design, and/or specific hypotheses you will test. You should also address any specialized knowledge or skills that are necessary to complete the research. [↑](#endnote-ref-2)
3. If you are planning to use existing data, explain the specific source, contact information, arrangement with collaborating agencies, and expectations about use of data and final products of your research. If you are planning to gather new data, describe specific methods, time, place, and equipment that will be required. [↑](#endnote-ref-3)
4. Your *positionality as a researcher* refers to the fact that one’s “…beliefs, values systems, and moral stances are as fundamentally present and inseparable from the research process as [one]’s physical, virtual, or metaphorical presence when facilitating, participating and/or leading the research project…” (The Weingarten Blog 2017). [↑](#endnote-ref-4)