UCDAVIS
**Graduate Program of
Environmental Policy and Management**

Professional Development Plan

████████████

Spring 2021
Advisor: ██████████████

Summary

My main interest is to work at the intersection between data science and environmental policy. My idea is to combine data analytical and computational tools with environmental policy knowledge to promote sustainable development. I believe that an analytical mindset, with quantitative and critical thinking skills, could help me to improve the effectiveness of public policies.

My plan is to pursue the Statistics & Data Analysis specialization, and perhaps also the Spatial Information Science specialization. I plan to take more courses in statistics and remote sensing.

Career Objectives

Desired attributes for my ideal career include:

- Positive impact on society
- Analytical job that challenges and makes best use of my quantitative skills
    - Opportunity to code and develop interesting models
    - Apply economic and environmental knowledge
- Opportunity for communication, publishing or participating in seminars
- Collaboration with multiple actors including those outside of my field
- Advising to transfer knowledge to others

Based on these attributes, potential jobs include:

- Environmental scientist or researcher
- Policy research analyst
- Data scientist

Potential organizations to work in:

- Environmental NGOs
- Public organizations (like CARB)
- Research group in a university setting

Skills I plan to develop during the EPM program include:

Skill Area	Transferable skills I posses	Transferable skills I need to develop
Critical thinking / Quantitative analysis	Coding skills Mathematical foundation Capacity to identify and focus on core (versus peripheral details)	Capacity to succinctly summarize main ideas from an analysis
Communication skills	Writing Reading critically	Effective communication to a specific audience Oral communication skills Mentoring
Leadership	Honesty Creativity	Share a common vision Motivating people
Teamwork	Willingness to collaborate	Listening Recognizing unique value that others bring to the team
Project Management	Micromanaging Visioning the broader picture	Efficient use of resources Managing deadlines Giving autonomy to each member

Practicum

I am planning to do my practicum with ███████████████, an NGO connected to the ███████████ center whose mission is to bring together all actors of the North Patagonian Lakes to achieve a balance between socioeconomic development and conservation of the natural, social and cultural resources. I will focus on the development of databases that can be used for evaluation and decision making for the protection of north Patagonian lakes in Chile. My focus of the work will be to study the type and role of the data used in the Lake Tahoe basin, and make a data infrastructure plan similar for Chile.

This practicum will help me to develop professional connections and work experience with top environmental scientist and policy leaders in Chile and California. By working in an NGO I will learn the

key topics to focus on promoting a sustainable development by advocating for the scientific community, citizen and government. I will gain first-hand experience in using quantitative tools to answer key questions of environmental problems. I plan to use data analysis and spatial analysis tools to understand the main challenges that lakes are facing.

Specialization

I plan to pursue the **Statistics & Data Analysis** specialization. This will allow me to improve my abilities to analyze data with the goal to obtain valuable information for public policies. I am interested on econometrics courses that combine statistical methods with economic theory and courses that focus on machine learning techniques and computational tools. Also, statistical courses that incorporates Bayesian theory would be interesting.

I am planning on pursuing a second specialization: **Spatial Information Science**. I think that GIS systems are helpful to visualize, model and communicate better environmental spatial problems, such as air pollution, land use or climate data. I want to take courses on spatial data science to better understand the potential use of spatial analysis and remote sensing to make better policy decisions. I believe there is a good intersection with spatial tools and data analysis.

Electives courses

Completed courses:

- **ARE256A - Applied Econometrics I (Fall 2020)** *4 units*: Basic tools used in econometrics, like the multiple linear regression model, instrumental variables, generalized least squares, seemingly unrelated regressions. Applied course with an emphasis on using R to run econometric models.
- **ARE256B - Applied Econometrics II (Winter 2021)** *4 units*: Continuation of ARE256A, with more topics to cover, like time series, autocorrelation, nonlinear models, binary response models, multilogit, tobit and panel data models.
- **ABT181N - Concepts/Methods in GIS (Winter 2021)** *4 units*: Overview of spatial analysis methods, including statistical approaches. Some content covered: patterns and processes, spatial autocorrelation, local statistics, interpolation, remote sensing and spatial distribution models.
- **GEO200CN - Quantitative Geography (Spring 2021)** *4 units*: Overview of quantitative approaches in spatial data analysis, with an emphasis on computer coding to implement these models.
- **ECI286 - Infrastructure Economics (Spring 2021)** *3 units*: Economics applied to infrastructure engineering planning, operations, maintenance, and management problems; microeconomic and macroeconomic theories; benefit-cost analysis; effect of uncertainty; optimization economics; non-classical economics; public finance.

Projected courses:

- **ESM186 - Environmental Remote Sensing (Winter 2022)** *5 units*: Overview of satellite, airborne, and ground-based remote sensing, building on properties of electromagnetic radiation. Applications include hydrologic processes, weather and climate, ecology and land use, soils, geology, forestry and agriculture. Computer based analysis and visualization of images and processing techniques.

- **GEO 286 - Topics in Remote Sensing (Spring 2022)** *3 units*: In depth investigation of advanced topics in remote sensing applications, measurements, and theory.

- **HYD273 - Introduction to Geostatistics (Winter)** *4 units*: Statistical treatment of spatial data with emphasis on hydrologic problems. Topics include theory of random functions, variogram analysis, Kriging, co-Kriging, indicator geostatistics, and stochastic simulation of spatial variability. Demonstration and use of interactive geostatistical software included.

- **ECS 171 - Machine Learning (Spring)** *4 units*: Introduction to machine learning. Supervised and unsupervised learning, including classification, dimensionality reduction, regression and clustering using modern machine learning methods. Applications of machine learning to other fields.

- **ARE 275 - Resource/Environmental Economics (Winter)** *4 units*: Development of externality theory, market failure concepts, welfare economics, theory of renewable and non-renewable resource use, and political economic models. Applications to policy issues regarding the agricultural/environment interface and managing resources in the public domain.

- **STA 141C Big Data & High Performance Statistical Computing (Fall)** *4 units*: High-performance computing in high-level data analysis languages; different computational approaches and paradigms for efficient analysis of big data; interfaces to compiled languages; R and Python programming languages; high-level parallel computing; MapReduce; parallel algorithms and reasoning.

- **STA 145 Bayesian Statistical Inference (Fall)** *4 units*: Subjective probability, Bayes Theorem, conjugate priors, non-informative priors, estimation, testing, prediction, empirical Bayes methods, properties of Bayesian procedures, comparisons with classical procedures, approximation techniques, Gibbs sampling, hierarchical Bayesian analysis, applications, computer implemented data analysis.

Other interesting courses that I could take are in the appendix of this document.

Networking & Mentoring

I am currently a **GSR for professor Allisa Kendall[1]**, from the department of Civil and Environmental Engineering. The GSR is about de-carbonization of the cement sector and is part-time during the spring quarter (49%) and full time in summer (100%). My work will focus on policies applied to the sector and to identify potential points of entry, in the value chain of stakeholders, for new regulations. Is a great opportunity to work at a local level on how to implement specific policies, which actors to include and to identify which points of entry could maximize the success of new measures. I am also glad to be working at the boundary of science and public policy, being a bridge between the technical engineer sector and the private cement industry.

Another mentorship opportunity is with emeritus professor **Lovell "Tu" Jarvis[2]**, from the Agricultural and Resources Economics (ARE) department. Tu is the executive director at the UC Davis Chile center and has connections with Chile Lagos Limpios, where I plan to do my practicum. This a great opportunity to learn from an experienced economist. During my practicum with Chile Lagos Limpios I plan to seek feedback and mentorship from Tu, on how to best apply data analysis and spatial tools to contribute to Chile Lagos Limpios mission. It will also give me the chance to network with UC Davis and Chilean environmental professionals dedicated to environmental protection.

I am also interested on joining the **UC Davis Data Lab[3]**, to attend seminars and workshops and to become an active member. This would allow me to learn new skills in data analysis, contribute to the UC Davis community, network with people with similar interest as mine and to be updated on the recent trends on data analysis.

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[1] https://faculty.engineering.ucdavis.edu/kendall/
[2] https://are.ucdavis.edu/people/faculty/emeriti/lovell-jarvis/
[3] https://datalab.ucdavis.edu/