

## **Sustainable and Equitable Water Management Geophysics 106/206 Earth Systems 106B/206B**

This course has been designated as a Cardinal Course by the Haas Center for Public Service. Cardinal Courses apply classroom knowledge to pressing social and environmental problems through reciprocal community partnerships. The units received through this course can be used towards the 12-unit requirement for the [Cardinal Service transcript notation](#).

### **Class Meetings:**

2:30-3:50 Tuesdays and Thursdays. Zoom Meeting or join via link on Canvas.

**Target Audience** – everyone. This is designed to be accessible to all, with the group work (and great TAs!) smoothing out differences in background.

### **Course Description**

California has committed itself to sustainable groundwater management, with passage of the Sustainable Groundwater Management Act (SGMA) in 2014, and safe drinking water access for all, with California's Human Right to Water Act (HR2W) in 2012. Students will work in groups (defined in Week 1 of the quarter so as to capture a diversity of background knowledge, perspectives and interests) to co-produce a Groundwater Sustainability and Equity Plan (GSEP) for groundwater management that meets the co-equal objectives of environmental sustainability and equitable resource governance. We will start with the Groundwater Sustainability Plan (GSP) submitted by the North Kings Groundwater Sustainability Agency (GSA), in Fresno County in California's Central Valley; this GSP was prepared and submitted to the state agency in order to meet the requirements of SGMA but does not fully consider HR2W. We will review the GSP and undertake revisions that move the document from a GSP to a GSEP. Within the context of the GSEP, we will identify data sources that can inform the planning process and can support performance metrics, to be defined, that can be assessed and monitored. We will work with "big" and "small" data, exploring the possibilities but also the limitations of using publicly available data for assessment and monitoring. The GSEP for North Kings, and accompanying analysis, will be developed over the quarter and submitted as a final report containing sections dealing with all of the background and supporting information. The GSEP will be written in such a way that it can serve as an example, with links to data sources, for the development of GSEPs throughout California.

Throughout the quarter, the class will work collaboratively to distill elements of the GSEP to create outreach materials that can explain key concepts to community groups and other stakeholders. This effort will be led by students enrolled at the graduate level.

There are five components associated with the course: weekly report-section assignments (that allow you to complete the sections of your final report), weekly web-material assignments (that build an outreach component of the class), discussions in class/online, the final written report, and a power-point presentation providing a high-level overview of the final report.

### **Course Participants:**

#### Instructors:

Rosemary Knight (Professor of Geophysics, Stanford)

Newsha Ajami (Director of Urban Water Policy and Senior Research Scholar with the Woods Institute)

TAs: Noah Dewar (Ph.D. student, Geophysics), Karissa Pepin (Ph.D. student, Geophysics)

In addition, we have the following people joining us to provide lectures, guidance and other forms of input over the quarter:

Darcy Bolstic, Pacific Institute  
Kassy Chauhan, Executive Officer, North Kings Groundwater Sustainability Agency  
Sawyer Clark Director of Development & Special Projects, Gold Leaf Farming  
Esther Conrad, Haas Center, Stanford  
Denise England, Water Resources Program Director, Tulare County  
Thomas Harter, Professor and Cooperative Extension Specialist in the Department of Land, Air, and Water Resources, UC Davis  
Kate Maher, Professor, Earth System Science, Stanford  
Felicia Marcus, Woods Institute  
Josue Medellin-Azuara, Assoc. Professor, Civil and Environmental Engineering, UC Merced  
Rich Pauloo, Project Scientist, Larry Walker Associates  
Isha Ray, Professor at the Energy & Resources Group at UC Berkeley

### **Format of the Course**

Tuesday's class will be in the form of a lecture, with time at the end of the class for small-group discussions related to the topic of the week's assignment. In the Thursday class, we will either continue with an additional lecture on the topic of the week, or be working on the assignments together, with discussion time.

Throughout the quarter, there will be numerous guest lecturers and visitors to the class, representing academics working on relevant topics, representatives from local and state agencies, and representatives from stakeholder groups in the San Joaquin Valley.

### **Plan of Topics for the Quarter**

Week of Jan 11: Introduction to the course. Introduction to the San Joaquin Valley.  
Week of Jan 18: The two acts: Sustainable Groundwater Management Act (SGMA) and California's Human Right to Water Act (HR2W)  
Week of Jan 25: Levels of responsibility/oversight for water quantity and quality  
Week of Feb 1: Creating a Groundwater Sustainability Plan, and a Groundwater Sustainability and Equity Plan; panel with stakeholders  
Week of Feb 8: Climate change.  
Week of Feb 15: Accessible, affordable water. A closer look at HR2W  
Week of Feb 22: Water quantity issues: groundwater levels, groundwater storage  
Week of March 1: Subsidence related to groundwater extraction; possible solutions  
Week of March 8: Water quality issues  
Week of March 15: Presentations

### **FOR MORE INFORMATION, SEE THE SYLLABUS:**

<https://syllabus.stanford.edu/syllabus/#/mainSyllabus>

**(Term: Winter 2021, Subject: Geophysics or Earth Systems)**