

Life before SGMA:

Historical analysis of groundwater management in California

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Outline

- Overview of research agenda and objectives
- Pre-SGMA situation
- Evolution of legislative tools for groundwater management
- Preliminary results
- Next research steps

Research Overview

- Title: **Developing Equitable Governance Institutions in Complex Socio-Ecological Systems**
- Goal: Answer a core question in environmental governance:
 - How political power asymmetries influence cooperation among stakeholders and shape institutional outcomes in complex socio-ecological systems.

Research Need

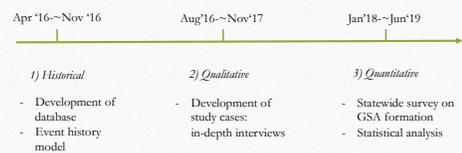
- Current institutional theory has not addressed how issues of political power and inequality affect decision-making processes through which new institutions are deliberated (Moe, 2005; Agrawal, 2013; Epstein et.al, 2014)
- Differing access and control over resources:
 - a) Influences actor's positions in multi-stakeholder platforms (Swyngedouw, 2015),
 - b) Capacities to actively engage in decision-making (Lubell et.al, 2002),
 - c) Capacities to mobilize discourses that promote 'bias' towards the decisions they favor (Bachrach & Baratz, 1962)

Research Overview

- Hypothesis: Power asymmetries play an important role in the emergence of institutions, design of governance structures and the forms they take (e.g. allocation of rights, rules of management practice), shaping institutional outcomes, which can be beneficial for some while detrimental for others.
- The "test" vehicle: SGMA implementation.
- Why?
 - One of the world's largest scale experiment on common-pool resource institutions.
 - It may define rights and rules for groundwater pumping aimed at changing the status-quo => Politically-contested process

Research Timeline

Developing Equitable Governance Institutions in Complex Socio-Ecological Systems



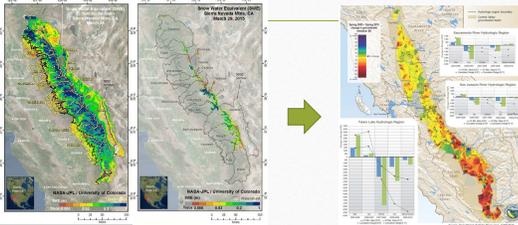
Research Timeline

Developing Equitable Governance Institutions in Complex Socio-Ecological Systems

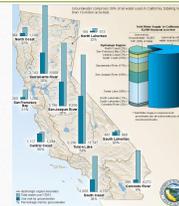


Pre-SGMA situation

↓ Rain + ↑ temperature = ↑ pumping



Groundwater Use

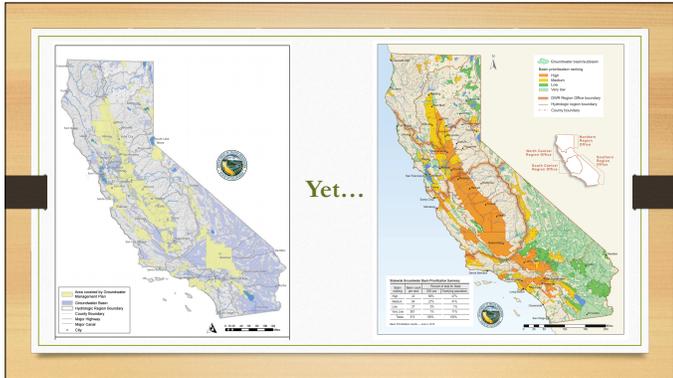


- Nearly half of California's drinking water supplies come from groundwater.
- Some communities are 100% reliant upon groundwater for municipal and agricultural purposes.
- At least 296 small community water systems have consistently failed to provide safe drinking water for years or even decades (pers. comm. Community Water Center, 2016).

Management? = Two routes

- Adjudication - court allocation of groundwater rights
 - 24/515 basins are adjudicated (However some under critical overdraft condition!)
- Legislation: **Voluntary** Groundwater Management Plans (GMPs)
 - AB 3030 GMPs = ~+133
 - Updated plans under SB 1938

Evolution of legislative tools for groundwater management



AB 3030

- 1992 = Assembly Bill 3030 (AB3030) first established California's Groundwater Management Act (GMA).
- It authorized local agencies to prepare and implement groundwater management plans (GMPs) by following a uniform, systematic procedure.
- Agency participation was entirely voluntary.

SB 1938

- 2002 = Senate Bill 1938 (SB1938), first substantial modification to GMA.
- It incentivized the completion of GMPs by withholding Department of Water Resources (DWR) funding for groundwater or groundwater quality projects from local agencies whose plans lacked certain criteria:
 - basin management objectives,
 - definition of management area,
 - agencies coordination and,
 - monitoring protocols

AB 359

- Signed 2011, enacted 2013 = Assembly Bill 359 (AB 359) further modified GMA.
- Required groundwater management plans with an additional component focused on identifying groundwater recharge areas.

Preliminary Results

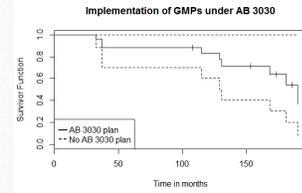
Database

Agency Name	Basin Count	Basin Name	Sub-Basin Name	Sub-Basin Management	Hydrograph	DWR Office	Basin Priority	Basin Area (sq ft)	Drift/Inflow	Inflow	Wells	Recharge (inflow)	AB 3030	TAC		
Alameda County	287	GALETON		1	Region 1	NRRO	Very Low	10740	1118	300	4000	256	25	197	1	9/19/07
Alameda County	17	SAN RAFAEL	ROSS	1	Region 1	NRRO	High	20660	4490	14000		60	8	1	9/14/04	
Alameda County	37	ANTIOCH		1	Region 1	NRRO	High	103000	21000		80	12	16	1	10/10/07	
Alameda County	111	BAY AREA		1	Region 1	NRRO	Medium	100000	2600	2700		32	3	2	1	9/19/07
Alameda County	16	VALLEY	Redwood	4	Region 1	NRRO	High and Medium	870341	100881	500000		6407	40	4	1	9/10/04
Alameda County	15	Upper Santa Clara		1	Region 1	NRRO	High	154000	806653	164215	26800	2182	5	237	0	
Alameda County	107	SAN FRANCISCO		1	Region 1	NRRO	Medium	425000	830000			6	30	1	9/14/04	
Alameda County	81,103	CONCESSION	Indio and Mesquite	2	Region 1	NRRO	Medium	305000	420000	140000		7	8	1	9/10/07	
Alameda County	2,803,341	San Joaquin		3	Region 1	NRRO	High and Medium	103000	220073	60000		676	79	3	0	
Alameda County	57	SAN FRANCISCO		1	Region 1	NRRO	Medium	91000	48300	11000	7700	58	60	45	1	10/20/04

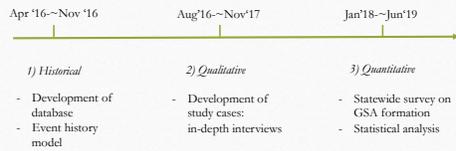
Preliminary Results

- About +130 water agencies submitted AB 3030 plans
- About 20% water agencies analyzed so far
- Preliminary Observations:
 - Geographical location, basin area and # of basins managed show significance.
 - # of institutional networks interesting interaction – the more networks, the more time an agency took to submit a GMP.

Time until Action



Next Research Steps



Questions?
Thank you!

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