CLIMAS COLLOQUIUM SERIES
EVALUATING ENVIRONMENTAL WATER ACQUISITIONS & REGIONAL CLIMATE SERVICES

CROSS CUTTING THEMES:

Use-inspired science & evaluation

Communities of practice – across academic disciplines
-- across public agencies, researchers, resource users …
EVALUATING ENVIRONMENTAL WATER ACQUISITIONS

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With appreciation to funders and collaborators:
A FAVORITE TOPIC

- Globally pressing issue
- Creative adaptive teamwork (like CLIMAS)
- Increasingly sophisticated over 30 years
- Plenty of challenges still to address
ENVIRONMENTAL WATER ACQUISITIONS (EWA) ESSENTIAL FOR REGIONAL CLIMATE ADAPTATION:

Preserve And Restore Ecosystem Services Provided By Water In Rivers, Lakes And Wetlands

- improved flood protection, water quality
- community and cultural values
- property values along lakes and rivers (hedonic valuation)
- recreation and renewal
- species recovery
OBJECTIVES IN TALK

- Provide quick overview: water for environment western US
- Changing role of public and private sectors, NGOs, foundations
- Evaluation approaches and metrics
- Moving forward – what’s left to do?
ANOTHER OBJECTIVE ...

*Infest some of you with enthusiasm for this work*

Cottonwood Creek, Wyoming
Photo credit: Jim Paussa,
Aspen Journalism
WATER FOR ENVIRONMENT: EARLY APPROACHES

- Early goal: legalize instream flow (ISF) water rights
- Endangered Species Act & Clean Water Act – litigation threat
- Buy senior ag water right & accompanying farmland
- Formal transfer of water right to ISF, facing many objectors
- Establish uniform year-round ISF requirement
- Buy and dry – permanently cease irrigation
- BUT: inflexible & costly – lock up water, lost ag production, acrimony
FAST FORWARD TO 2018

- Thousands of ISF water rights – concentrated in Pacific Northwest
- Many flexible agreements with ag that do NOT alter water rights
- Cease irrigating hay & alfalfa when least profitable, streams need H2O
- Switch to low water use crops, “deficit” irrigation
- Policy effort to reduce “buy and dry”

Pinedale, Wyoming ranching
Photo credit: Jim Paussa, Aspen Journalism
CHANGING ROLES OF PUBLIC AND PRIVATE SECTORS, NGO'S, FOUNDATIONS

- early: public agencies, NGOs - expend $$ to acquire water & to litigate
- 1990s to present: major foundations and local water trusts create and fund environmental water acquisitions, and ongoing public sector support, beverage companies

NOW
- diverse corporations invest to protect water in their supply chain
- investment funds getting into water rights portfolios
Arizona

16 tribal nations with water quantifications (court rulings & negotiated settlements)

Most settlements provide water for environmental needs on tribal lands

Map Source: Inter Tribal Council of Arizona
ROLES FOR ECONOMISTS

- Continue valuation work – contributions of water for environment
- Sophisticated contracts to alter seasonal pattern of water use
- Payment mechanisms that send clear incentive signals
- Evaluate – efficient use of $$ & water?
EMPHASIS ON EVALUATION

- Experience with formal program evaluation?
- Funders want to know if money well spent
- Learn from experience, refine EWAs
- Growing community of practitioners evaluating environmental programs and EWAs
EWA EVALUATION CHALLENGES

- systematically tracking transaction activity
- paying farmers to reduce water consumption: are we getting "new" water?
- data – absent & inscrutable
WHAT MAKES A GOOD METRIC?

- use-inspired: findings make a difference for EWAs (ex: water pricing)
- measurable based on accessible data
- measurable at reasonable cost and timely
- replicable across years, programs and regions
TYPES OF EWA EVALUATION METRICS

- Environmental “in-the-stream” metrics
- Policy metrics
- Economic metrics
Source: Kendy et al, 2017, Environmental flow duration as a percent of the 33 cfs flow target for Whychus Oregon case study (2001-2015). Actual streamflow as a percent of the 33 cfs flow target at the OWRD gage at Sisters, accumulated for August 1st through September 30th each year.
EXAMPLE ENVIRONMENTAL FLOW POLICY METRICS

Legal authorization ISF water rights
Enforcement of ISF rights
Procedural barriers to ISF rights

Source: Szeptycki, 2015
Water Transactions Activity SCORECARD
(excerpts, draft not yet released, location information removed)


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<th>Transaction Category &amp; Indicators (units)</th>
<th>Indicator 3-Year Avg</th>
<th>% Change 3-Year Avg</th>
<th>Score 2016</th>
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<td>I. Water rights change out of ag</td>
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<td>Decrees (unique case #s)</td>
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<td>Volume (estimated afy)</td>
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<td>II. Temporarily move water from ag</td>
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<td>Volume (estimated afy)</td>
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<td>III. ISF Water Right Acquisitions</td>
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<td>Stream segments initiated (number)</td>
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<td>0.66</td>
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<td>IV. Innovative transactions (NOT buy and dry) (number)</td>
<td>11.33</td>
<td>10</td>
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</table>
ECONOMIC METRICS

- Water, money and jobs move across water-using sectors due to transactions
- Overview rather than technical economic analyses (love talking about nerdy calculations – email me)
ECONOMIC METRICS (TWO CASE EXAMPLES IN OR, NV)

ECONOMIC METRICS

Source: Kendy et al, 2018 Crop types planted annually (bars), in acres, and economic productivity of irrigation water (line), expressed as annual gross revenue in dollars per acre-foot of water used.
EWA METRICS UNDER DEVELOPMENT

- better water economic productivity indicators
- effects on regional drought resilience
- effects of EWAs on regional economy, jobs and businesses
- diversity of participation in EWAs and sharing of benefits
PUZZLE MOVING FORWARD

- Meaningful metrics often not measurable
- Measurable metrics often unsatisfying
Fall 2018 Graduate Course Offerings in Water and the Environment

AREC 575  Tues/Thurs 12:30-1:45  Resource Economics: Incentive-based Policies and Environmental Markets

Description: Economic incentives, tradable permits and markets for ecosystem services are pivotal in contemporary water and environmental policy. This interactive seminar-style course covers economic theory and methods for evaluating water and environmental laws and policies, including ecosystem service provision, tradable water permits, benefit cost analysis, externalities, public goods and valuation methodologies. Case studies include federal, state, tribal and international water and environmental policies.

Prerequisites: One full semester of natural resource economics or microeconomics

AREC 579  Mon/Wed 4-5:35  Economics of Water Management and Policy

Description: Economic optimization for water management and policy design. Topics include optimal use of water, water as an input in producing various goods, habitat and ecosystem services; water demand and supply; water pricing and conservation incentives; policies governing water rights and allocation for environmental needs; managing water shortage risks; and economic models of water conflict and bargaining over water. Interactive seminar-style course. Calculus proficiency and regular attendance essential. Meets jointly with AREC 479. Undergraduates meet at a scheduled day and time different from the graduate session.

Prerequisites: One semester of college calculus

Which class is right for you? Proficient in college calculus and have a basic background in economics, take AREC 579. Not proficient in calculus, but have taken microeconomics or resource economics, take AREC 575.

Have questions? Please contact Prof. Beth Colby at bcolby@email.arizona.edu
DISCUSSION – ENV WATER ACQ

(DAN – SET TIMER)
SWITCHING GEARS
CLIMAS

BY THE NUMBERS

1,920 CLIMAS related Twitter followers
11 Advisory Boards Served On
2 Radio Appearances
105 Instances of CLIMAS Research Mentioned by Media
65 Presentations Given to Stakeholder and Academic Audiences
2 Academic Awards Received
44 Blog Posts Written

23 Academic Articles Published
11 Podcasts Recorded
14 Online Tools Developed/Improved
23 Climate Briefings Disseminated
10 Workshops and Trainings Facilitated
3 YouTube Videos Produced
24 Reports Produced
REFERENCES

