

Summary of Cimarron Group

Participants

OSU: Gehendra Kharel, Phil Alderman, Tyson Ochsner, Jason Patton, Jingnuo Dong, Max Melstrom, Omkar Joshi, Chris Zou

OU: Tony VanWinkle, Linda

TU: Estelle Levetin, Josh McLoud, Rashmi Mohanty

OK EPSCoR Retreat

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Integrative Research Questions

1. How do extreme climate events affect the **vulnerability** of socio-ecological systems in the Cimarron River Watershed? (ENVISION) (Zou & Kharel)
2. What socio-environmental factors contribute to differential **vulnerabilities** to extremes at the community level (gender, race, age, income)? (Ethnographic/social modeling/Ag Model) (Alderman & VanWinkle)
3. How can soil moisture information improve fungus, spore and pollen forecasting and reduce **vulnerability** to respiratory allergy? (Statistical modeling) (Levetin & Tyson)

Integrative Research Questions

How do extreme climate events affect the **vulnerability** of socio-ecological systems in the Cimarron River Watershed? (ENVISION) (Zou & Kharel)

- Which land management decisions can reduce the vulnerability of water quantity and quality in river, reservoirs, and groundwater?
- How policy can be used to improve wetland ecosystem conservation and restoration?
- How extreme climate events, policy and land use affect different types of stakeholders differently?

Identified Data Needs

- Climate
 - GCM projections (Gehendra)
 - Historical observations- precipitation, temp., wind, relative humidity (available)
- Hydrology
 - Topography, stream network, soil (SSURGO), USGS stream flow (available)
 - Soil moisture map (Tyson)
- Land use land cover
 - NLCD, NASS CDL, GAP (available)
 - CRP, OK land cover inventory data (Sam)
 - Tribal land?
 - Wetland
 - Cedar map (Xiangmin)
 - Reservoir area and storage (NRCS) (Chris)
- Social
 - USDA Ag Census, Socio-demographics- US Census (Tony)
 - Historical archived (land use, disturbance, human behavior)- Tony
 - *Survey (M-SIS net) (Linda)*

Identified Actors/Influencers

- Land owners and users
 - Farmers/ranchers
 - Tenants
 - Corporate land users (energy companies)
- Home owners/residents
- Resource Agencies
 - local, state, federal
- Tribal land owners and agencies
- Grassroots and environmental organizations

Identified Policies/Scenarios

- Farm bill
 - Conservation easements, CRP
 - Subsidies, insurance
- Economics
 - International trade policy
 - NAFTA
 - TPP
- Climate projections (scenarios)
 - Downscaled GCM data (Gehendra)
- *Encroachment bill*

Identified Process-Based Models

- ENVISION
 - Hydrology- FLOW (HVB)

Identified Evaluative Models

- Food production (crop yield)
- Water quantity (stream flow)
- Water quality
- Wetland loss/gain – Statistic Model
(Dan Dveortt)

Identified Stakeholders

- Farmers/ranchers
- Corporate land users (energy companies)
- Resource Agencies
 - local, state, federal (NRCS)
- Corp of Engineer /Hydropower
- Environmental organizations (Duck Unlimited)
- Tribal land owners and agencies

Data/Personnel Gaps

- Social data (survey data)
- Economic data
- Evaluative models

Thanks

vulnerability

- Ideas from participants:
- Human and natural factors contributing to the vulnerability of the watershed and to what extent?
- Distribution of land conservation in improving watershed health (wetlands- water quality); ways to improve conservation areas
- Use of soil moisture information to improve fungus spore and pollen forecast and to reduce vulnerability to respiratory allergy
- Extreme events impact on quality of life (human health)

- How do extreme climate/weather events affect the vulnerability of non producer ag stakeholders (impact on the rural economy) within the CRW?
- What socio-environmental factors contribute to differential vulnerabilities to extremes at the community level (gender, race, age, income)?
- Policy implications and environmental regulations (property tax, farm bill, subsidies, energy development, Endangered Species Act— are there any ES in CRW?)

- Extreme events, climate
- Quality of life, human health
- Vulnerability, differential vulnerability
- Non-ag producer stakeholders
- Socio-environmental factors
- policy

Data

- Use of soil moisture information to improve fungus spore and pollen forecast and to reduce vulnerability to respiratory allergy
 - 15 years of spores (available)
 - Allergy symptoms behavior
 - Allergy related medical costs