

Hazards and Impact group: Peggy Nelson, Keith Kintigh, and Tim Kohler

1. Geographical Study Area: Southwestern US
2. Key Hazards or environmental challenges
 - a. Temporal variability in precipitation
 - b. Spatial unpredictability of precipitation
 - c. Flooding
 - d. Extreme dry periods (drought)
3. Past Impacts (on environment?)
 - a. Depletion of artiodactyl populations
 - b. Depletion of vegetation for fuelwood and as riparian cover
 - c. Depletion of soils
 - d. Erosion and downcutting
4. Human Response/ Mitigation
 - a. Movement: Migration, reorganization
 - b. Repairs to canals and terraces
 - c. Use of lower ranked food resources
 - d. Expansion of cultigens
 - e. Investment in infrastructure – new canals, upland fields, etc.
 - f. Changes in organization and ritual practice ??
5. Future Risk
 - a. Limited water rights
 - b. Poverty
 - c. Depletion of resources
 - d. Dry periods
 - e. Health status
 - f. Education status
 - g. Pollution to air and water

Output:

1) New Knowledge- what are the most important new findings in your area/topic.

This is very difficult to say for the Southwest. For our research team at ASU, I would say that we are finding that comparisons of several long-term sequences are helping us understand

- a. the role of rigidity traps in the magnitude of social/cultural transformations
- b. the tradeoffs inherent with investments in infrastructure to capture and direct water -- short term productivity, long term vulnerability to climate change

c. the complex relationship between climate, subsistence practices, and the response characteristics of plants

d. the tradeoffs in investment in diverse social networks of interaction – short-term advantages of suppressing diversity, long-term reduction of resilience by doing so.

e.

2) Your top 5 emerging new research questions

a. Which co-evolved diversity tradeoffs in social-ecological systems, if any, can claim both short-term advantages and longer-term resilience? OR Are there particular types of diversities in ecological landscapes or social organizations, or both, that make co-evolved systems more susceptible to loss of resilience?

b. To what extent does social isolation contribute to vulnerabilities? What kinds of vulnerabilities? Does isolation speed transformation?

3) Fundamental limits to progress

a. funding

b. working across disciplines

c. collaborating with native people

4) Blockages that can be removed by collective action:

All of the above

5) Action Areas related to 2, 3, 4 above:

6) Synergy of research with outreach, education, heritage development

Our research is fully integrated into institutionalized programs for middle school through graduate school – GIOS education partnerships, COURS, CGS, etc. We can talk about this, if you wish. We also collaborate with IHOPE to put

timelines with real data onto a public website for wide use and we have designed our own system for digital timelines (within MimPIDD)

7) Deliverables (immediate, + 1 year, + 5 years)