Applying systems thinking

Treasure, Turf and Turmoil:
The Dirty Dynamics of Land and Natural Resource Conflict

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What do we mean by system?

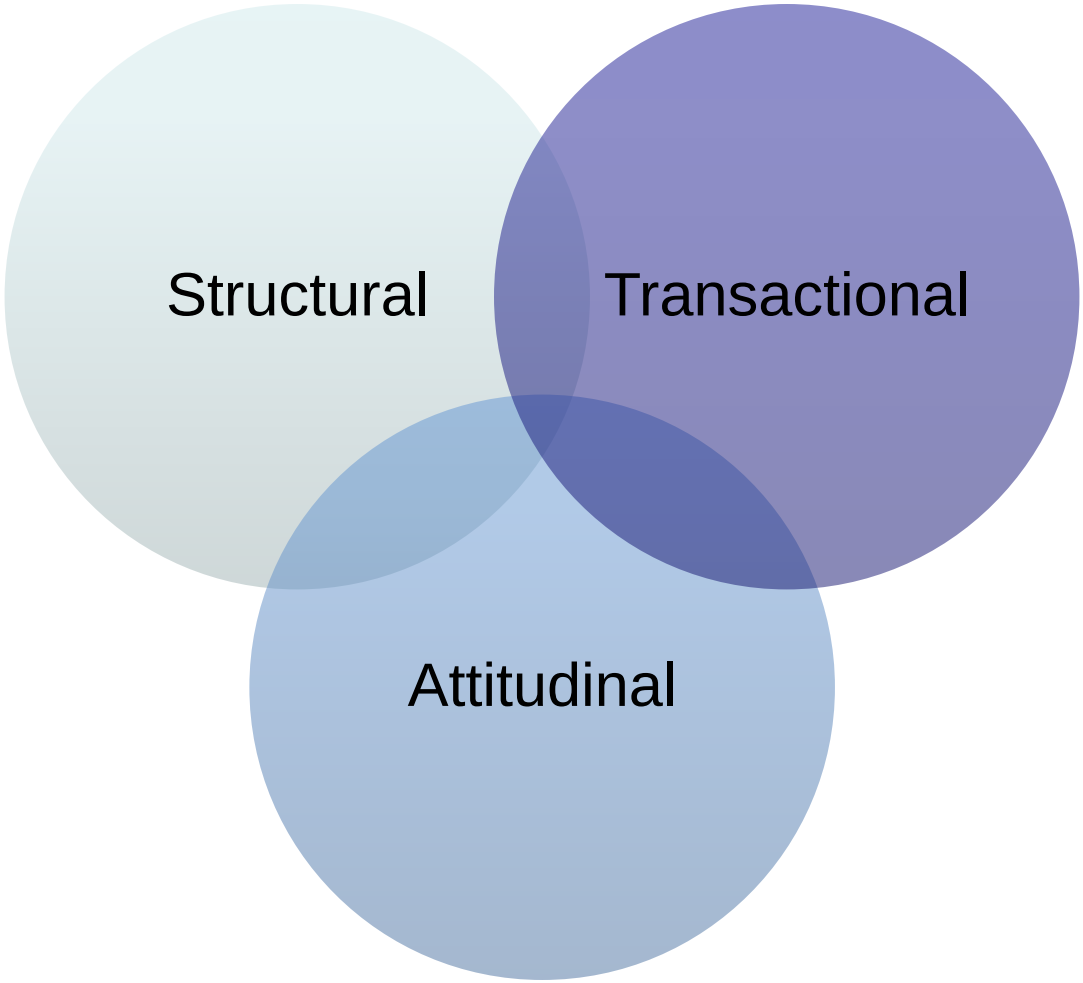
- An aid for understanding connections and flows among sectors, actors, biophysical units in nature
- Complements reductionism (breaking down units to study them)

In development…
a system coherently organizes sets of elements in a way that achieves a “purpose.”

Intersecting systems

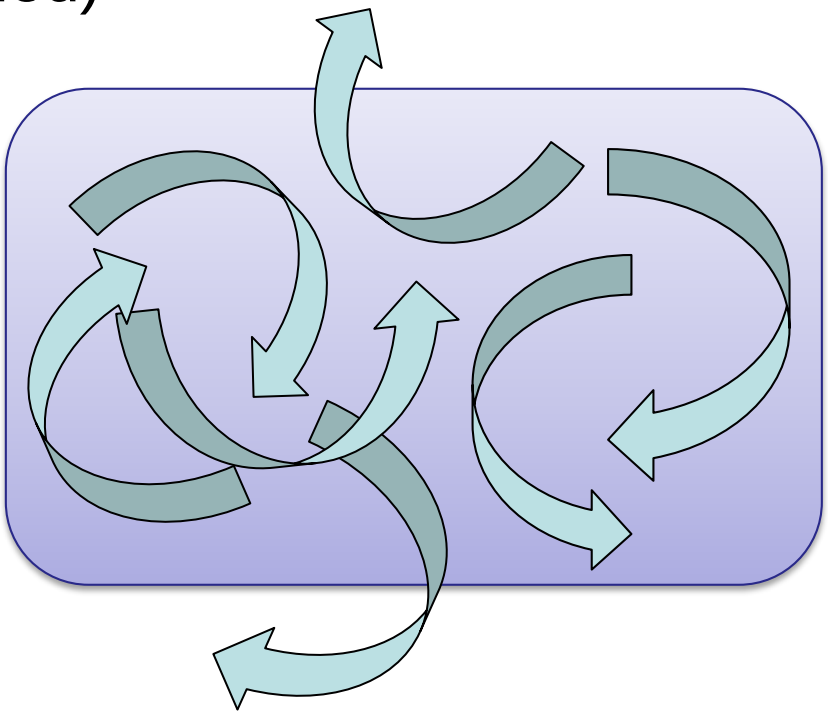
- Ecosystems (various scales)
- System of laws, regulations, and rules (codified, “informal”)
- Interactions between the two
  - Environmental and natural resource governance (semi-predictable interactions)
  - Rapidly emerging change

Social system elements



System dynamics

- Energy flows
- Feedback or causal loops
  - Negative (changes neutralized)
  - Positive (changes magnified)
- Systemic change

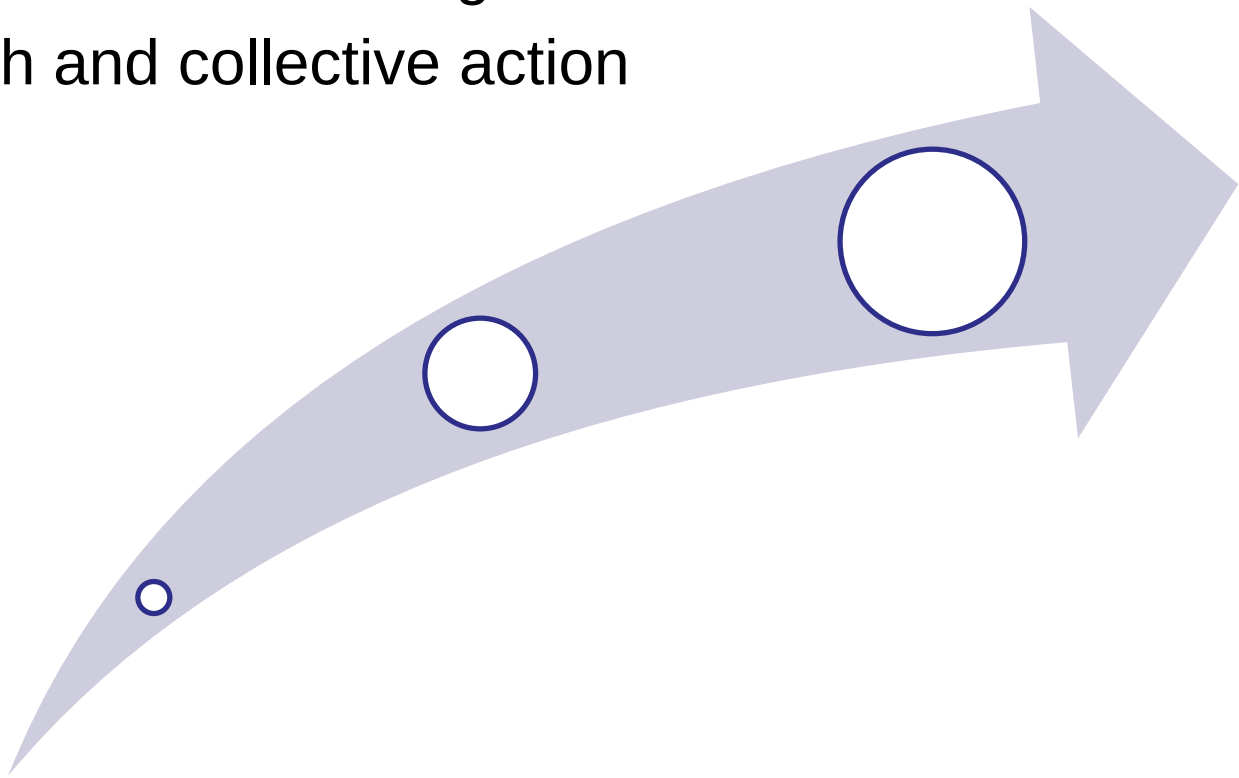


Ripple effects

- Human-biophysical ripples
- Mediated by human institutions, technology

Scale

- Biophysical system scale
- Human institutional scales
- Scale mismatch as conflict generator
- Scale match and collective action

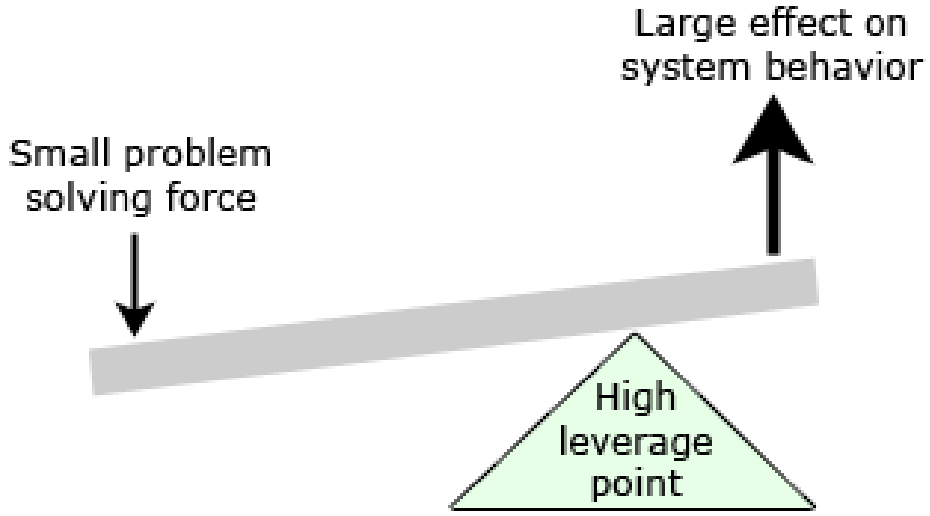


Timeframe and scale

- Working at larger scale may save time
- Urgency factor
- Timing is critical

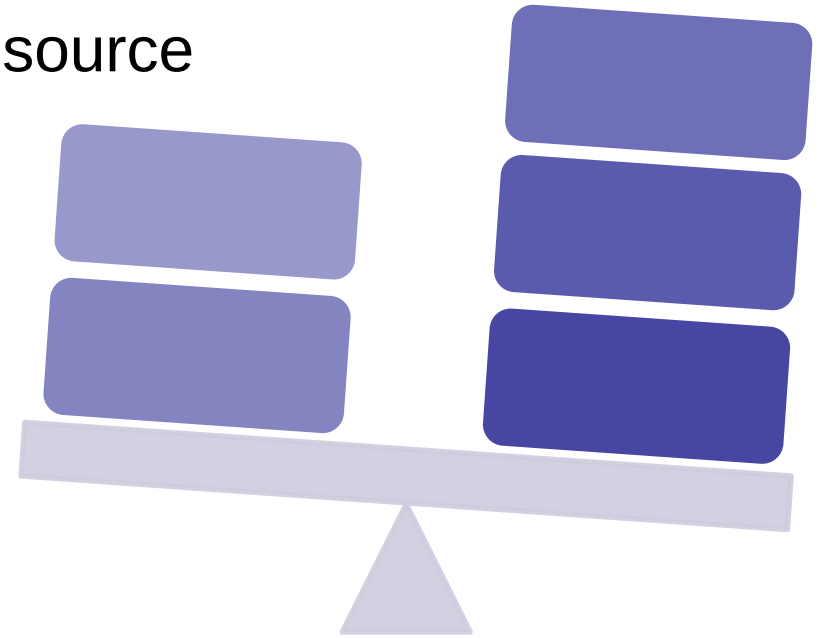
System leverage

- Leverage people
- Critical mass
- Density points (multiple connections)
- Negotiation with system change

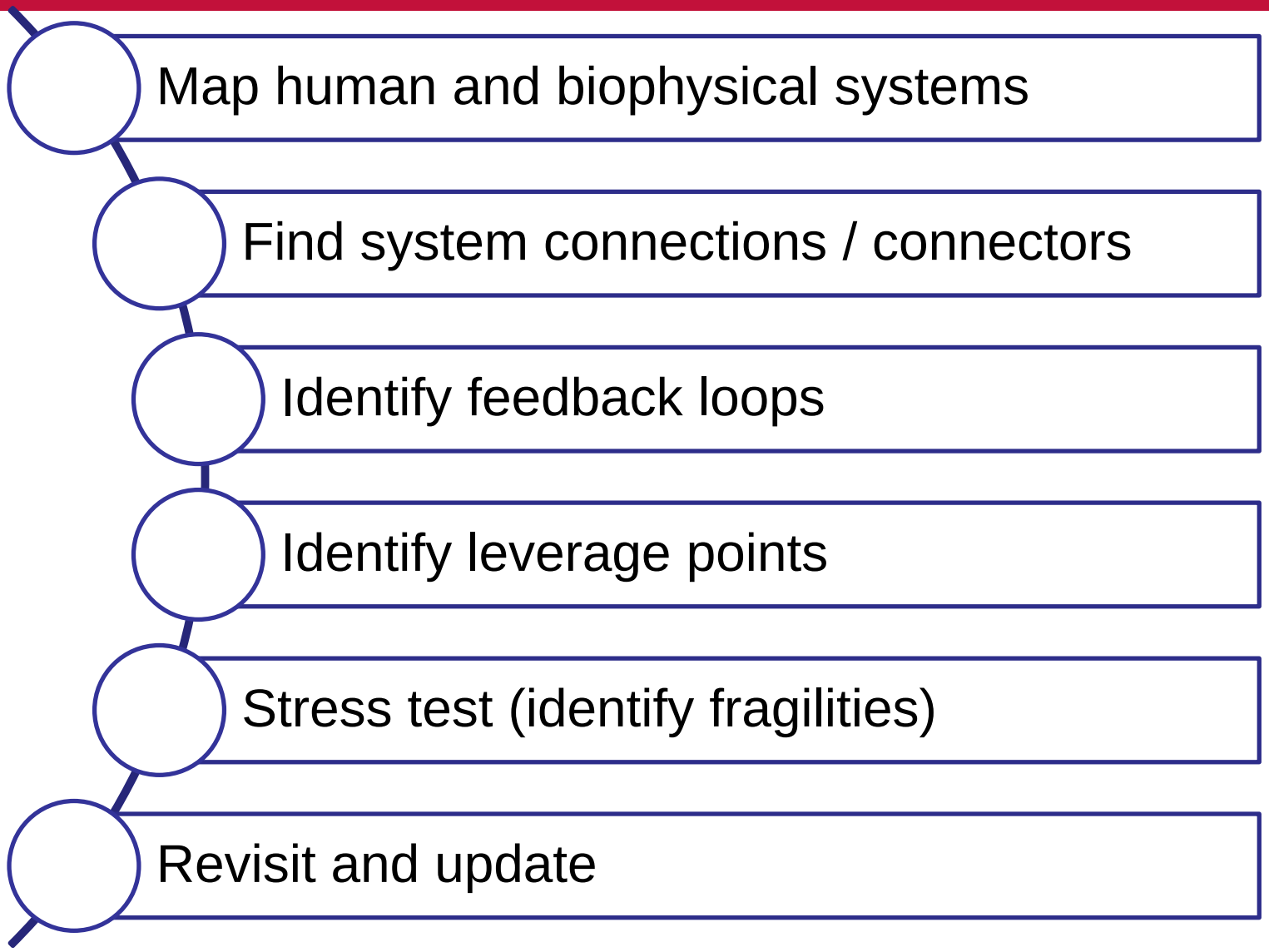


Tipping points

- Triggers
- Emergent properties
- Fluctuation duration and severity
- Change/loss of linchpin resource

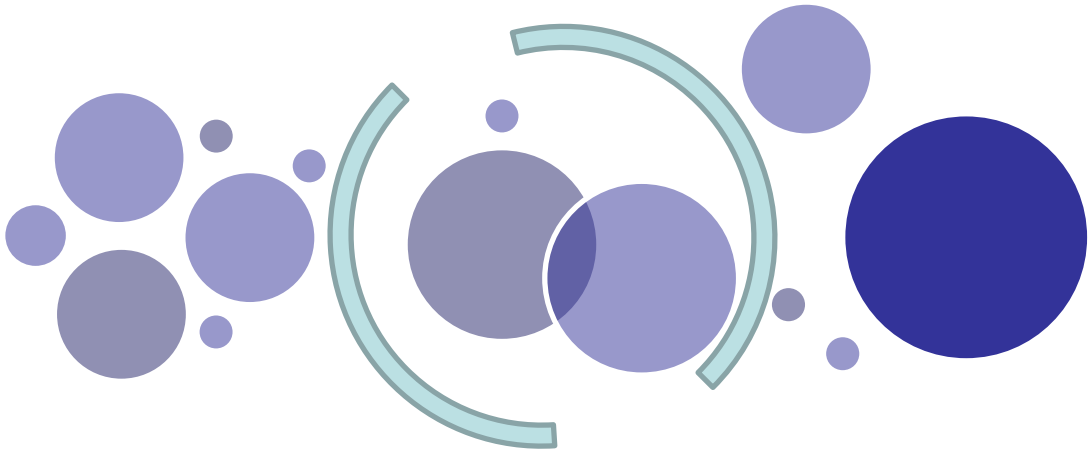


Using systems



Bounding and modeling systems

- What is inside and outside?
- Modeling complexity or highlighting key connections?



Collapse

Is Jared Diamond correct?

Resiliency

- Redundancy
- Diversity
- Learning
- Negotiation

Summary

- Systems are models of elements, connections and interactions
- Human and natural systems intersect and influence
- Institutions mediate
- Scale defines and is defined by systems
- Timing and timeframe impact actions at scale
- Leverage points increase efficiency of action
- Systems are both fragile and resilient

Table Exercise

- What systems might you consider when addressing complex problems of conflict over natural resources and land? Why are these systems important?

- What are some key intersections of biophysical and socioeconomic systems? Provide some examples.