

The Agricultural Transitions Project: Partnerships and Insights



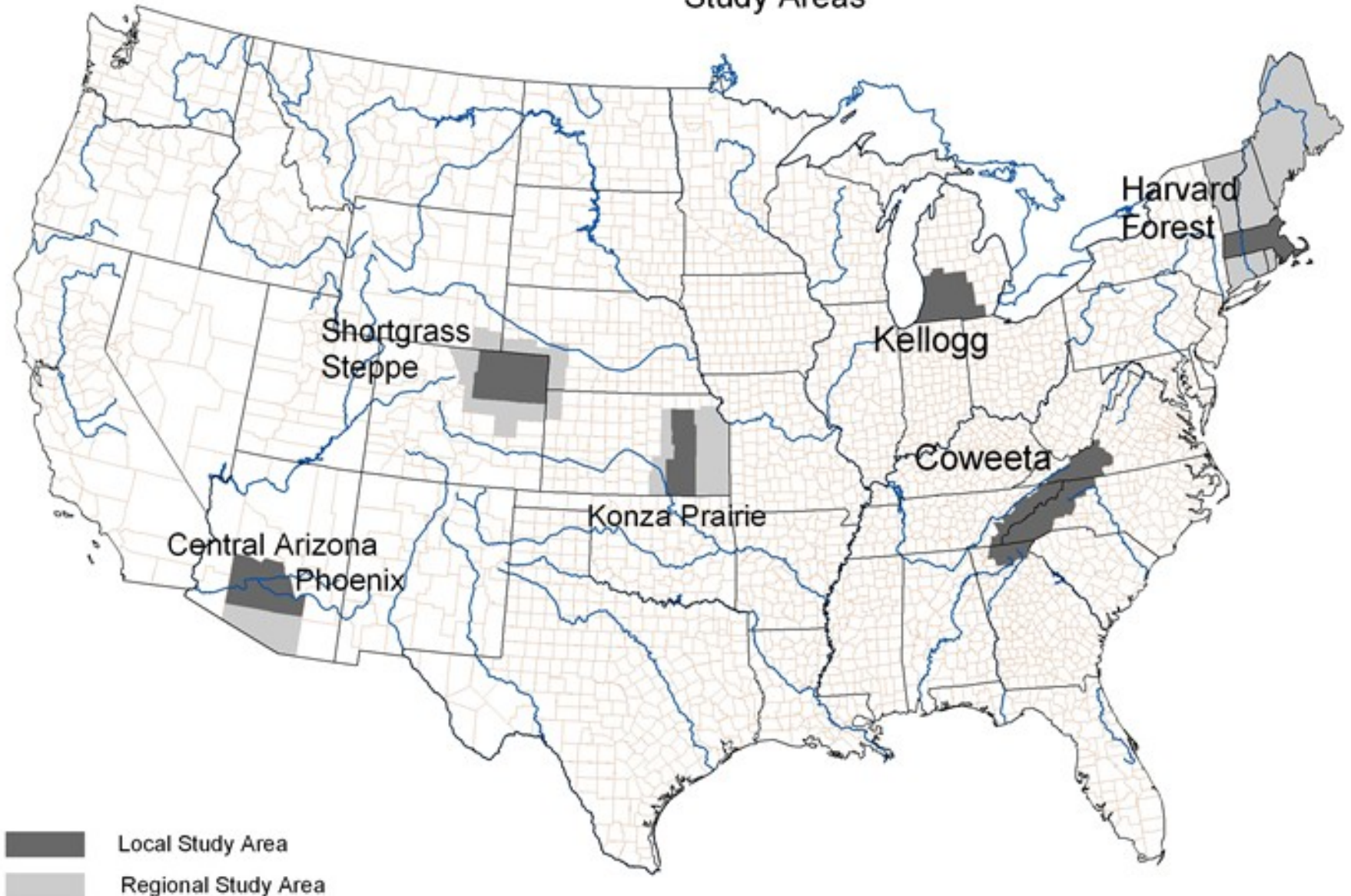
Charles L. Redman, representing CAP, CWT, HFR, KBS, KNZ, SGS and The Nature Conservancy

Emergence of Partnerships

- Seeking unifying socio-ecological topics
- Drivers, implications and ubiquity of agrarian land use change
- The strength and immediacy of linkages between social and ecological processes
- Ecological systems have intrinsic rhythms and humans impose patterns of their choosing

AGRARIAN LANDSCAPES IN TRANSITION: A CROSS-SCALE APPROACH

Study Areas



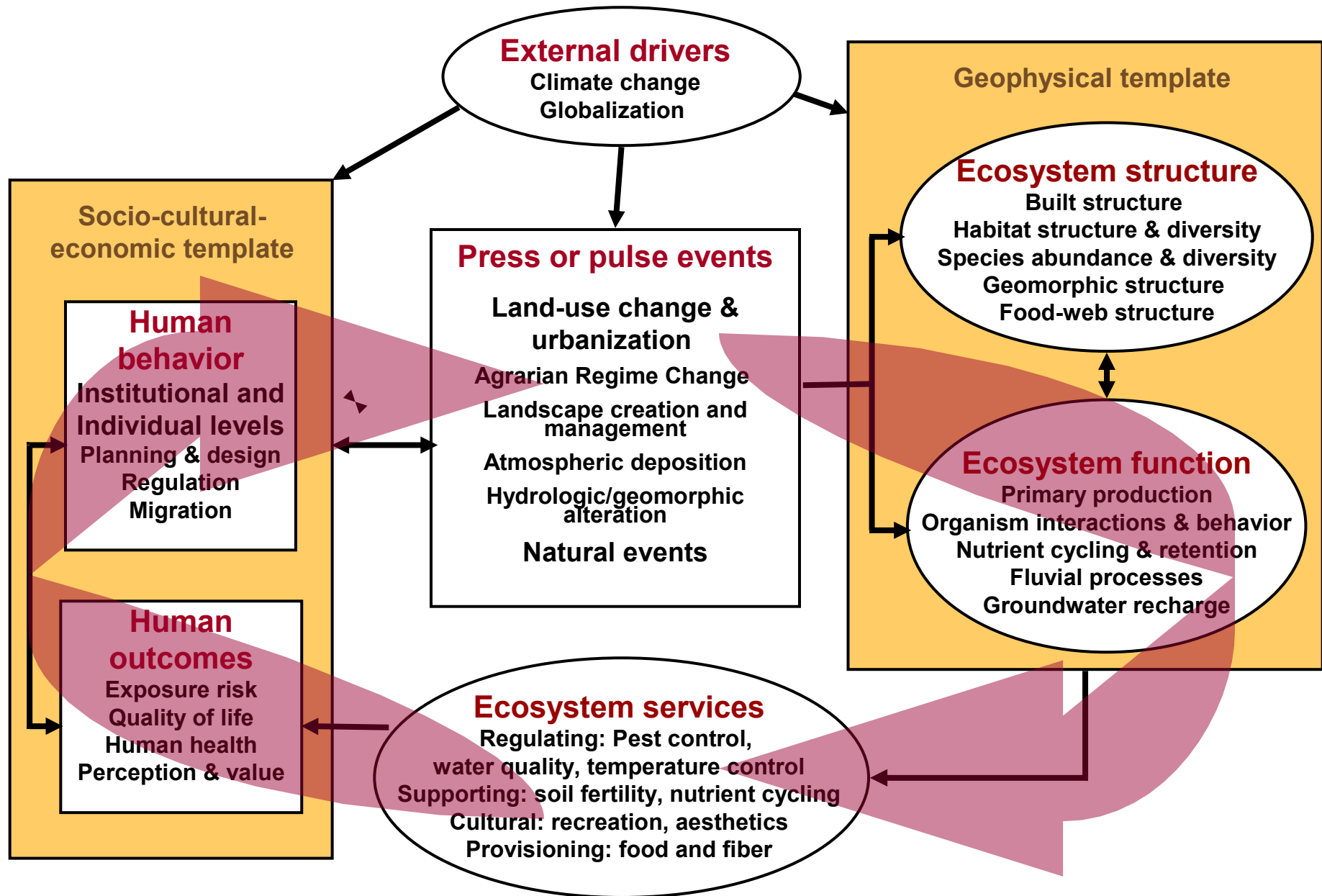


AGRARIAN LANDSCAPES IN TRANSITION:

A CROSS-SCALE APPROACH

- Comparative
- Long time spans (lags and legacies)
- Multi-scalar
- Strength of causal loops and triggers
- Socio-ecological theory building
- Implications for conservation

Conceptual Framework after Collins et al. 2007 ISSE



Agricultural Transition Stages

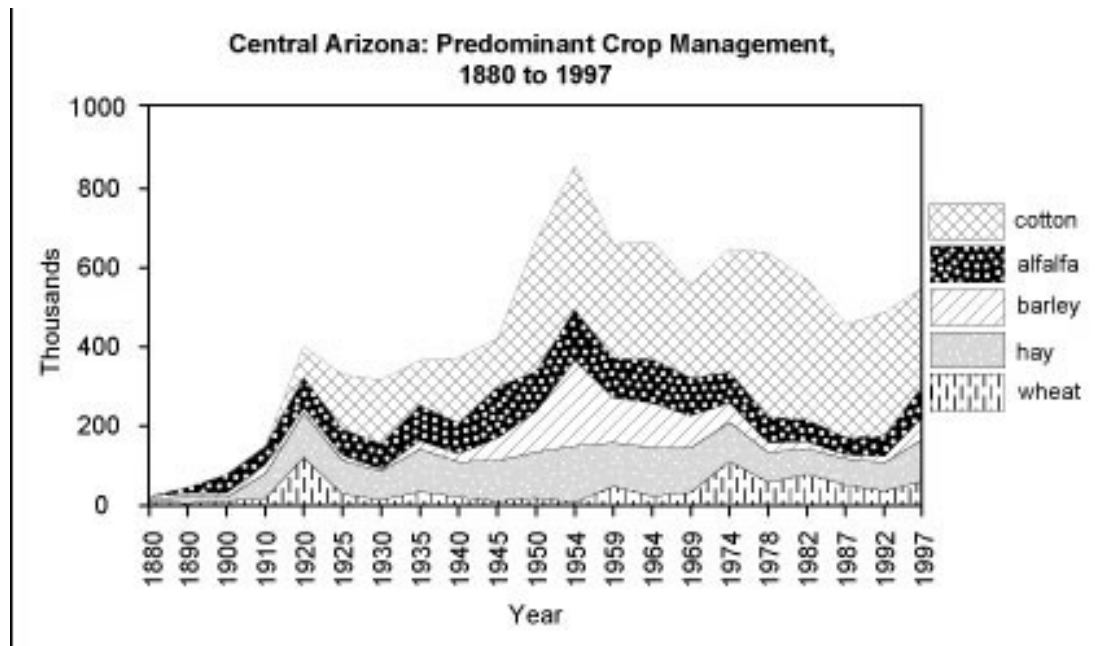
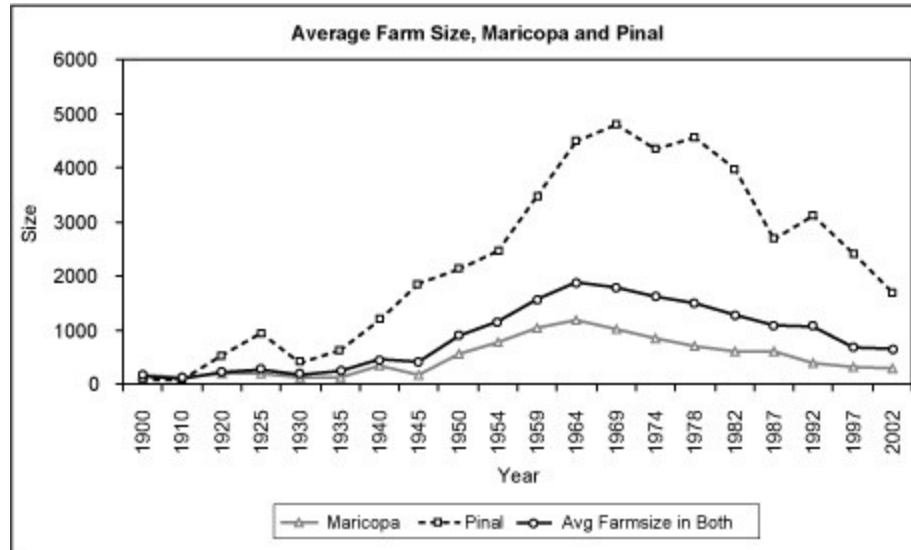
Agricultural Transition Stages

1	2	3	4	5	6	7	8	9
Pre-horticulture	Pre-European one	Pre-European two	Beginning of modern European agriculture in crop choice	Zenith, golden years, mechanization	Depression	Intensification, specialization	Post-intensification	Decline of agriculture

Agricultural Transition Timeline by Site

BC		AD																
8000	1000	0	500	800	1000	1200	1400	1500	1600	1700	1750	1800	1850	1900	1950	2000		
HARVARD	Pre-horticulture	Pre-colonial horticulture							Colonial agrarian	Commercial Agriculture	Specialized, national economy	Downhill/Suburbanization						
COWEETA		Horticulture	Corn, beans, squash						Subs with European crops	Mechanization, market revolution	Specialization, intensification	Downhill						
KELLOGG												Extensive development	Golden Age	Depression Intensification	Regulation	Ag and Rural Restriction		
KONZA						Pedestrian Hunt			Horse and Gun Hunt		Influx	Zenith of Ranching	Depression	Structural Adjustment	Emerging Conservation			
SGS						Pedestrian Hunt			Horse and Gun Hunt			Ag Settlement	Mature Dryland Ag		Intensive fertilization, irrigation			
CAP			Hohokam												Emergence		Boom Years	Metropolis

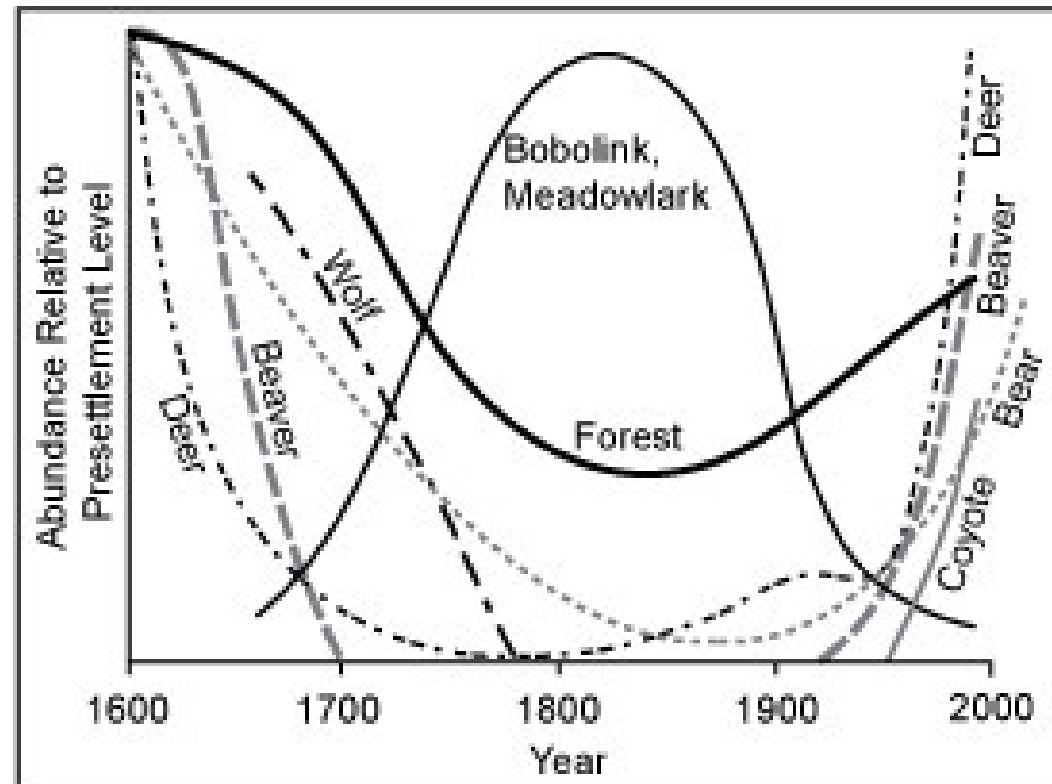
Changing Agrarian Patterns



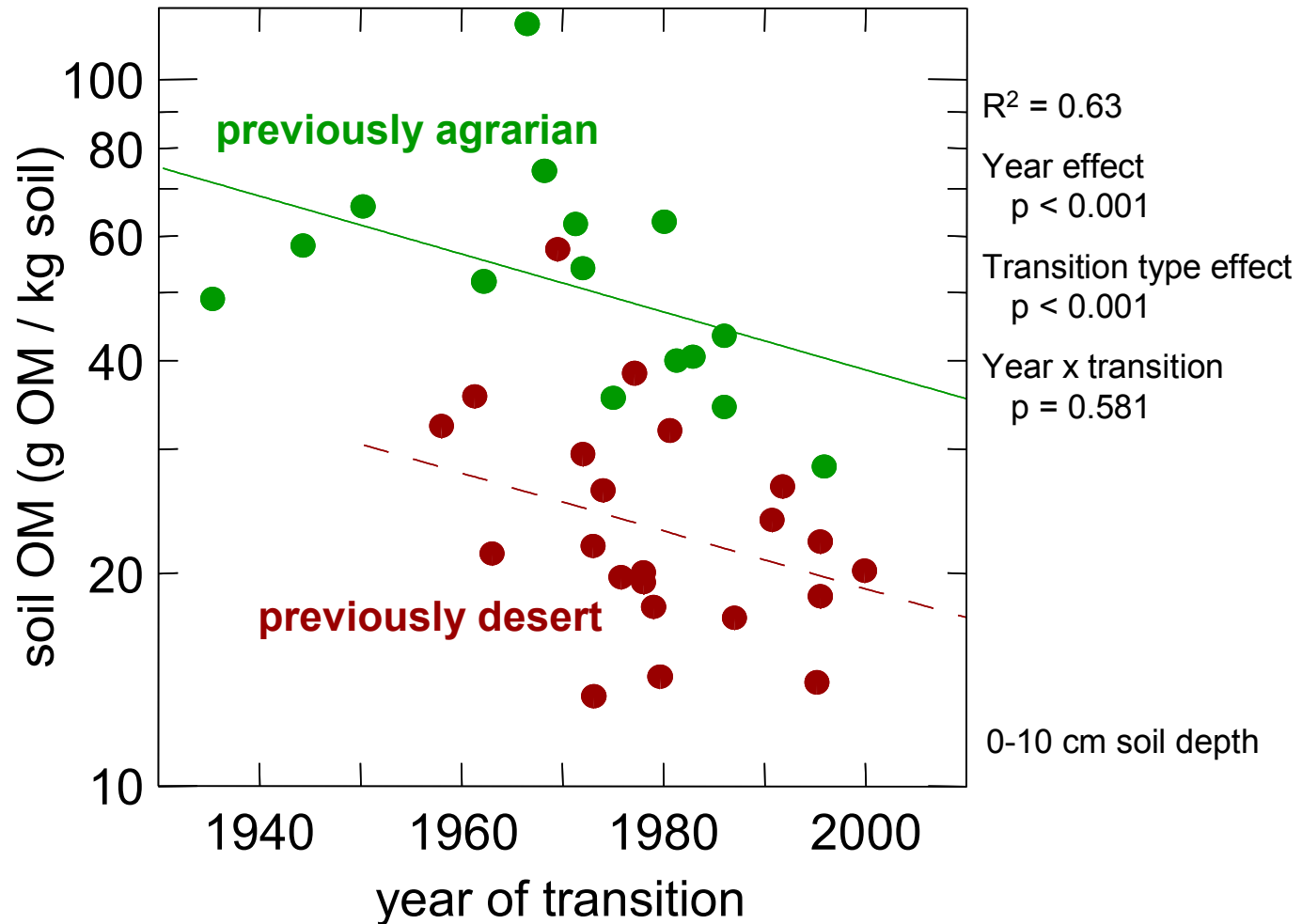


Abundance Relative to Pre-settlement Level

Harvard Forest LTER



Measuring Legacies: Soil organic matter in urban, residential yards (CAP)



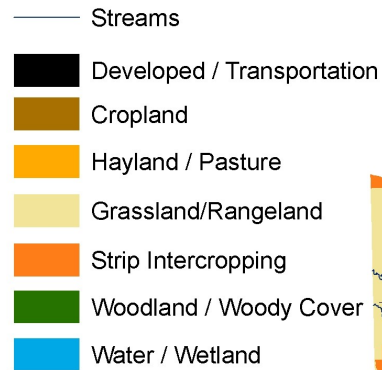
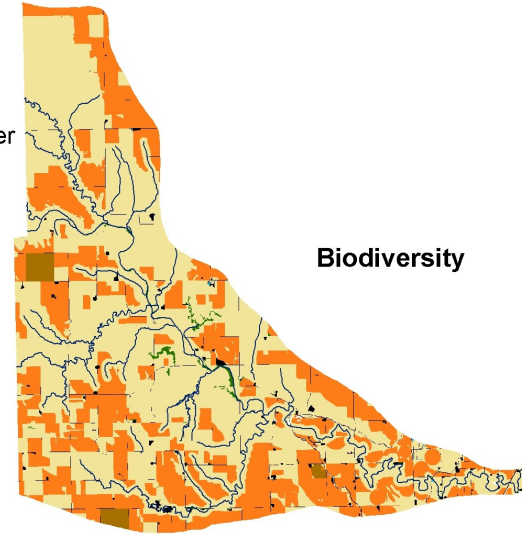
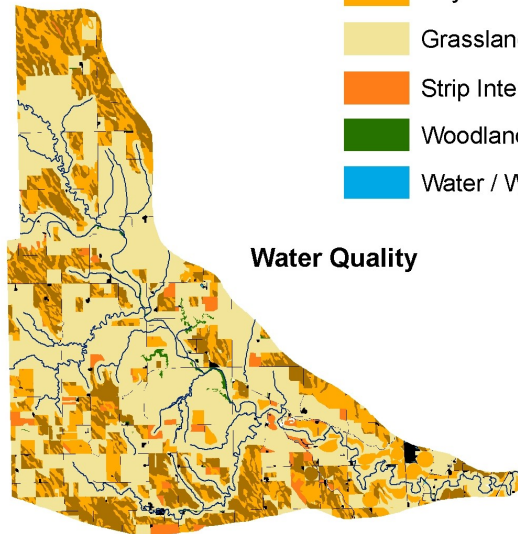
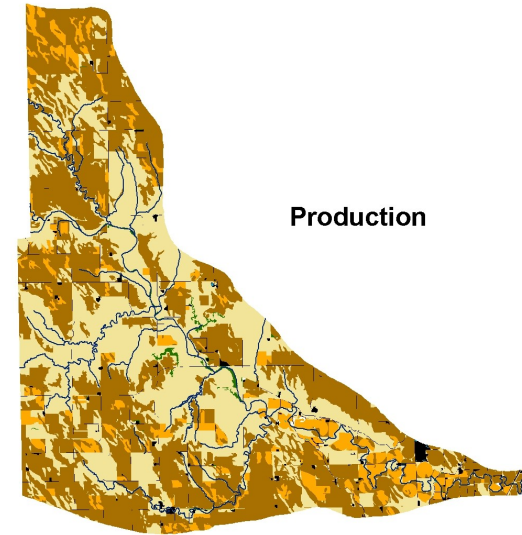
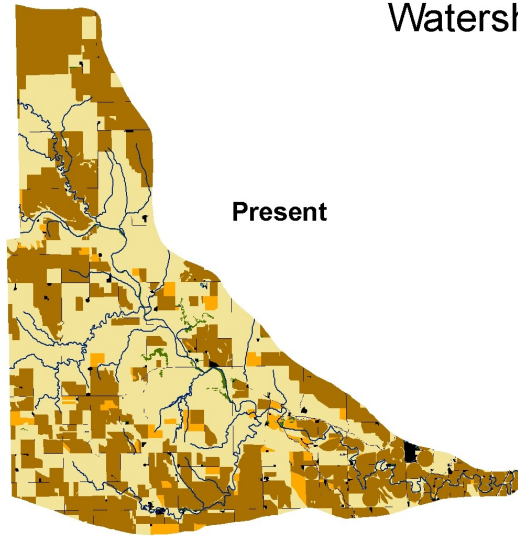
Emergent Research Theme 1: Ecosystem services

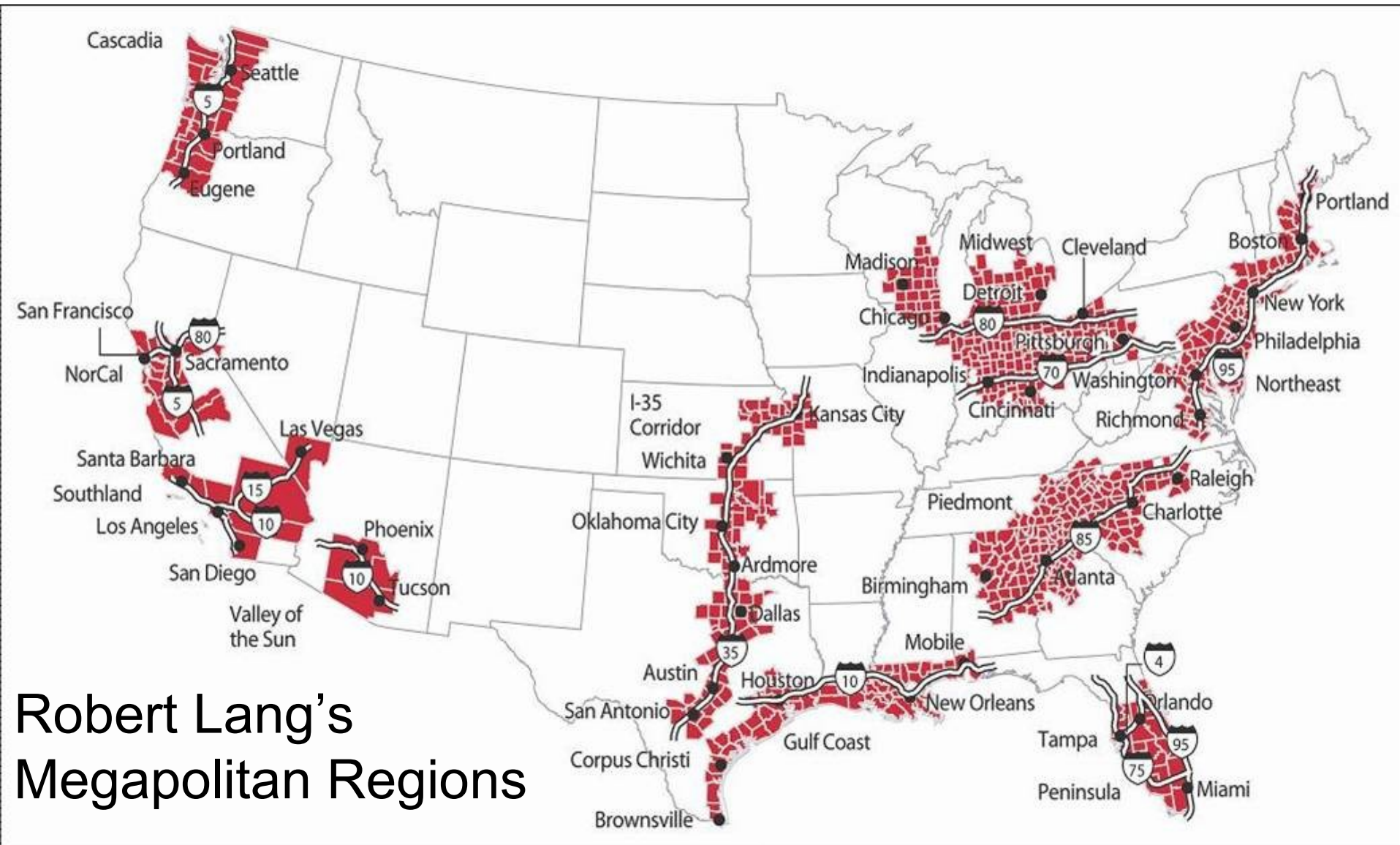
- In May 2007 24 LTER sites met to compare critical ecosystem services across the network
- Those identified most often included:
 - Provisioning: food, freshwater
 - Regulating: water, climate
 - Cultural: recreation, ecotourism, inspiration, and sense of place
- Three grouping of LTERs emerged

Emergent Research Theme 2: Scenarios and Land Management

- Harvard Forest leading a group forecasting changes relating forest management and carbon sequestration
- SGS and Konza are looking at scenarios that maximize production, water quality, or biodiversity
- CAP is exploring a future land management framework combining a Megapolitan scale with bioreserve hotspots

Present and Future Scenarios for Lower Pawnee Watershed



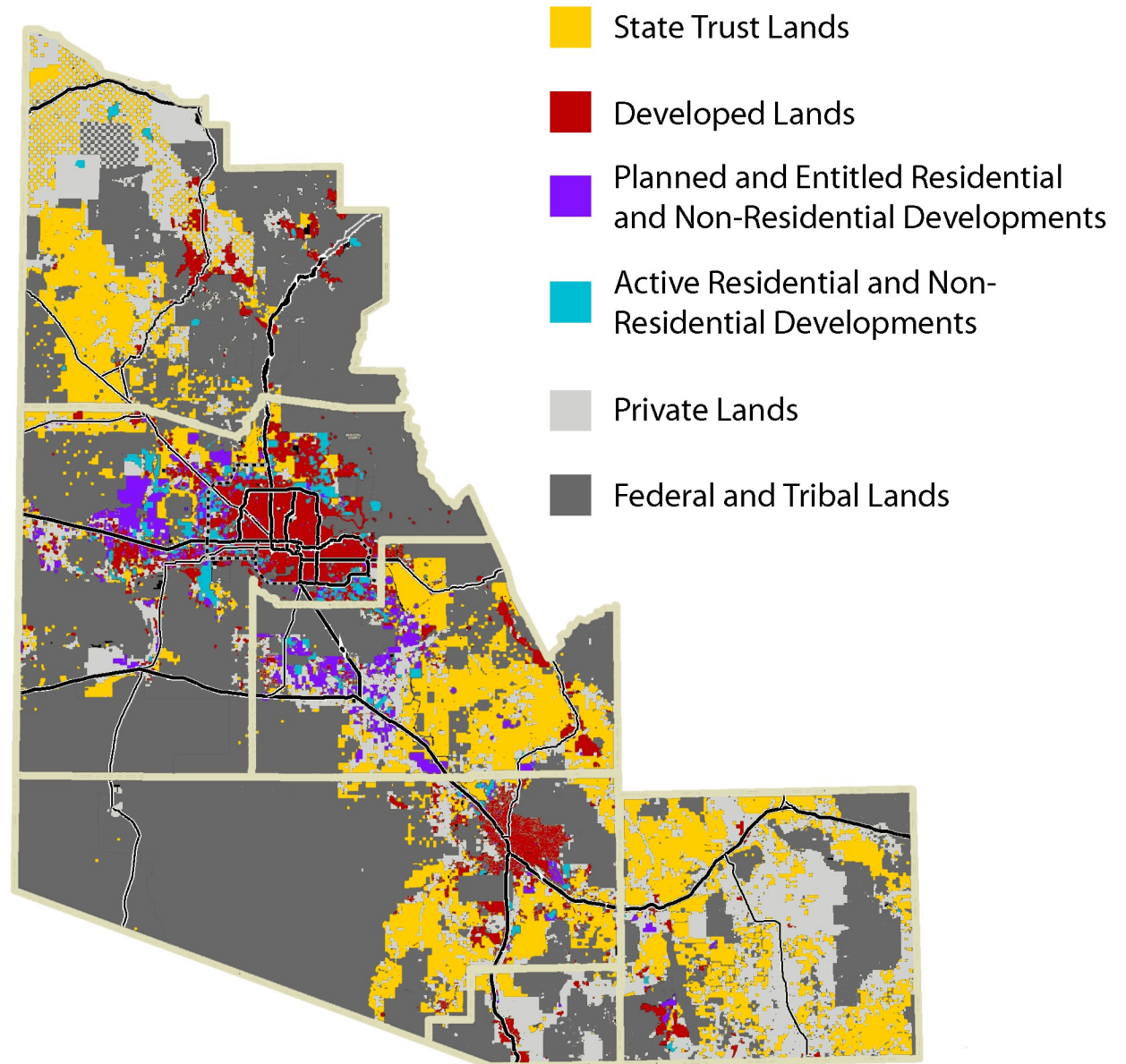


Robert Lang's
Megapolitan Regions

Why Megapolitan Scale?

- Groups of cooperating cities and linked landscapes
- Predicted to become economic and political unit of greatest power and influence
- Key interpretive unit for biophysical processes as well
- Hence, appropriate unit for socio-ecological planning and management

Build-out Plans for Central Arizona- Phoenix Region



Emergent Research Theme 3: Novel Ecosystems

- Abandonment and secondary regeneration (Lugo & Helmer 2004)
- Provisioning landscapes and their margins
- Trans-edge exchanges with agricultural and urbanized ecosystems
- Globalization and 'Invasive' species partnership with DIVERSITAS, BESTnet, and CCM
- Domesticated Nature (Kareiva et al. 2007) and Designer Landscapes (Grimm & Redman 2004)

