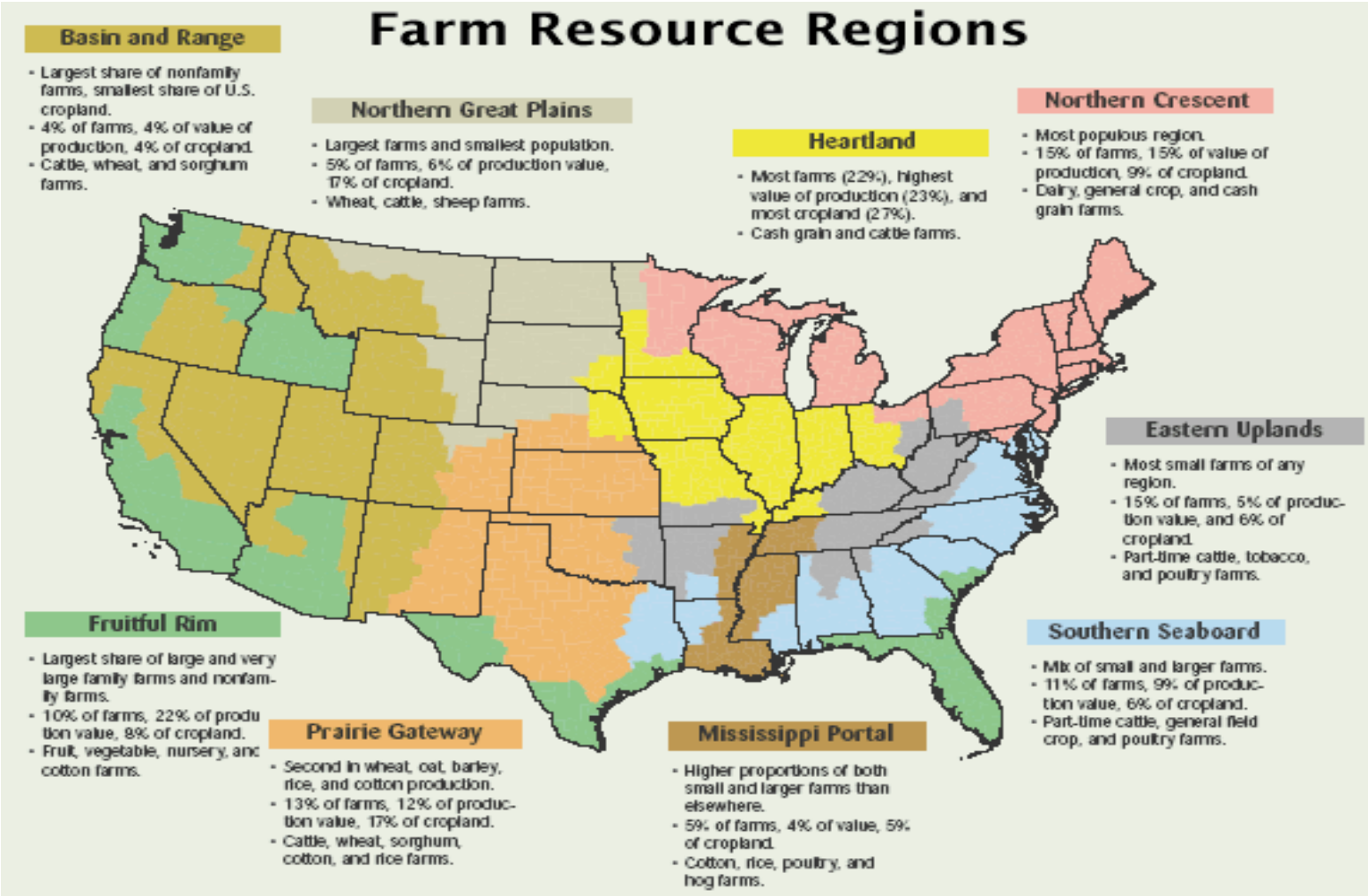
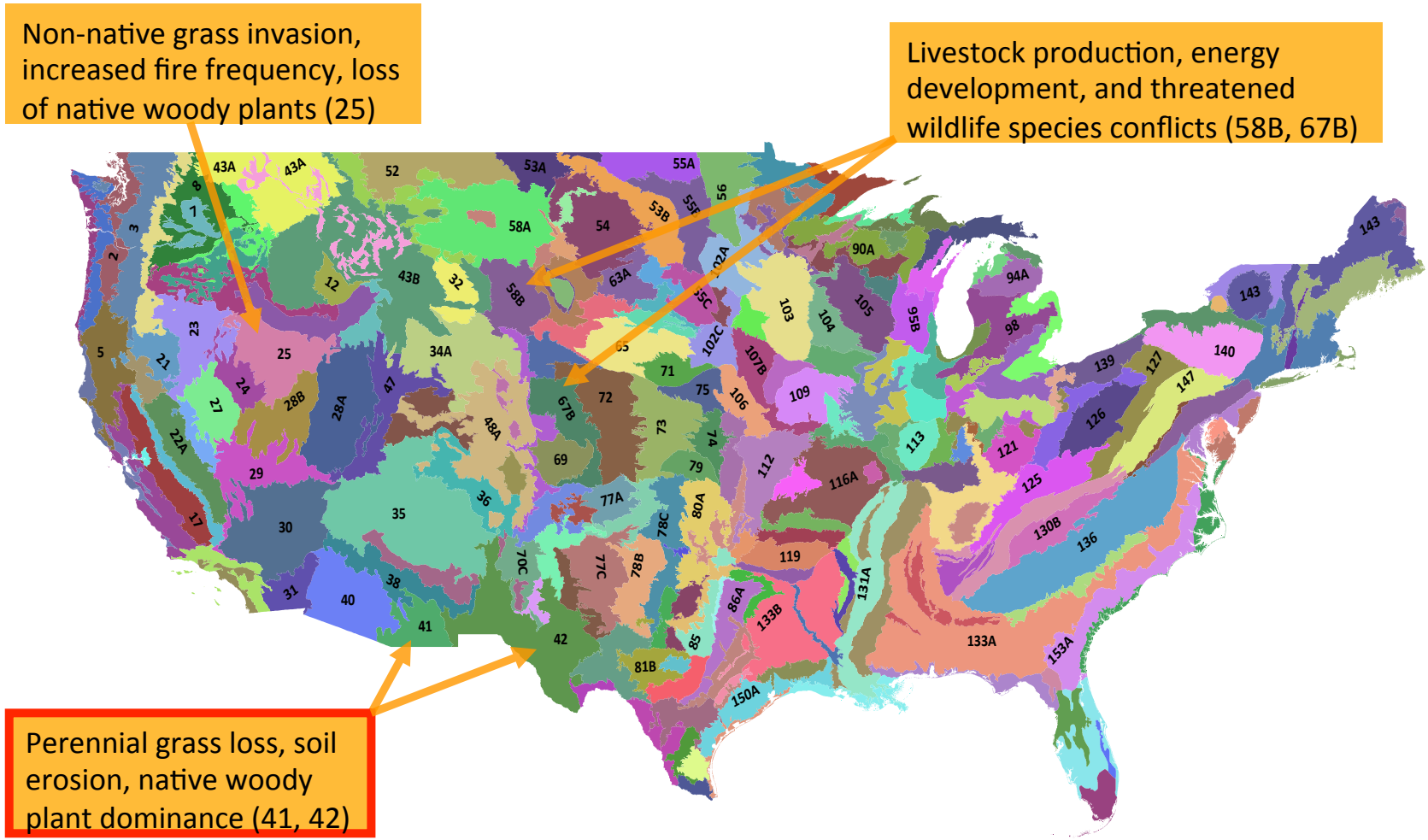
Prologue (4 slides) – Our program rationale

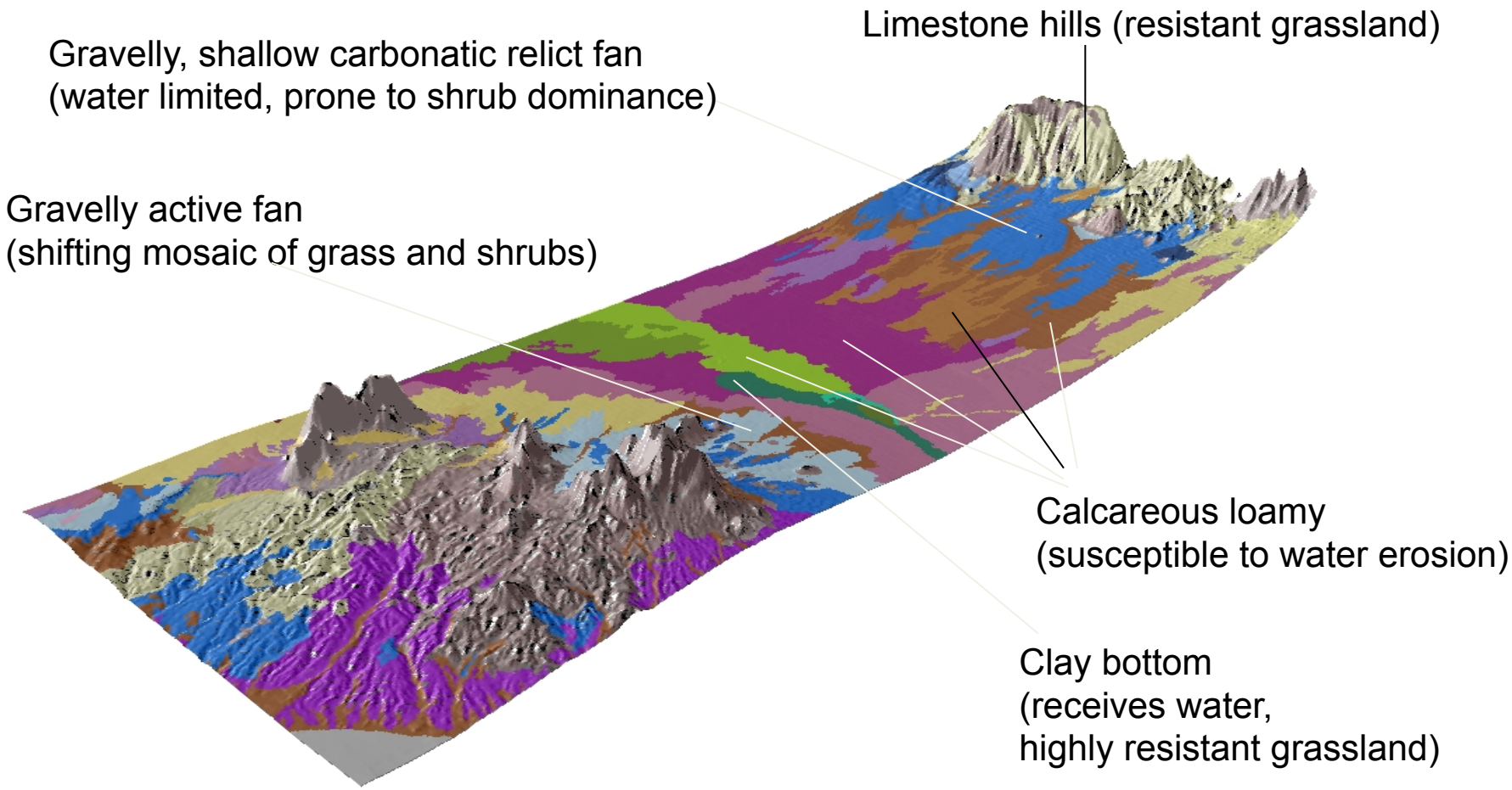


Because of our physical location at the interface of the Basin and Range and the Prairie Gateway, we have built a research program that can "bridge" across regions.

Major Land Resource Areas (MLRAs) of the continental USA distinguish broad differences in potential for goods and services, and types of ecological dynamics based on current climatic and biophysical boundaries



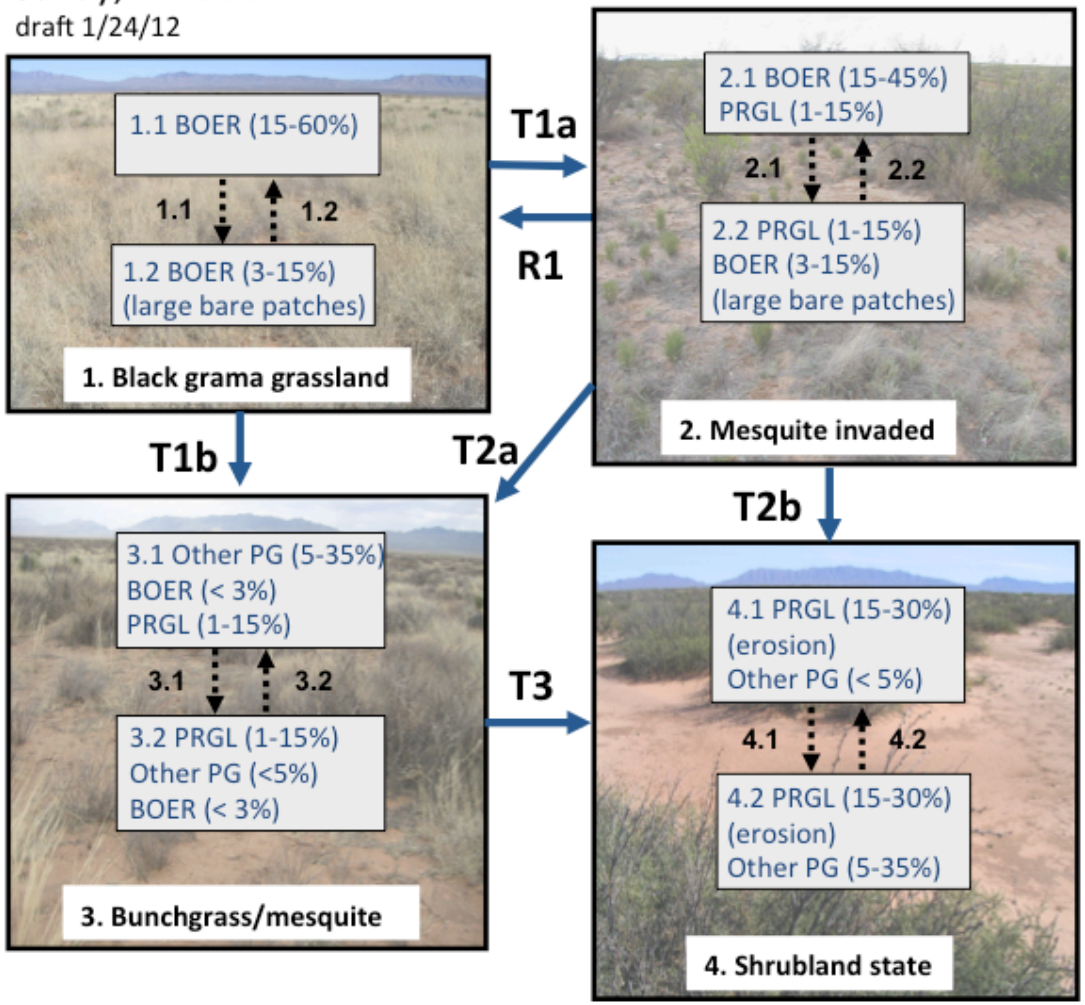
We still work to elucidate principles, but understand that they must be contextualized to locations…



Mosaic organization repeats across MLRAs

Basic premise is that we can understand how “repeating units” within an MLRA respond to drivers…

Sandy; MLRA 42.2
draft 1/24/12



T1a. Mesquite establishment facilitated by seed transport by cattle, bare patches > 50 cm, and relatively wet springs
R1. Shrub removal via herbicide or fire followed by black grama recovery to > 15%
T1b, T2a. Black grama is reduced below ca. 3% cover by heavy grazing in drought
T2b, T3. At perennial grass cover < 5%, wind and storm events, trigger deep, spreading soil erosion

A working example of this basic premise…

The goal of the research unit based at the Jornada:

Develop ecologically based knowledge systems and technologies for management, conservation, monitoring, and assessment of western rangelands.

Thus, the title for our research project plan:

Management Technologies for Conservation of Western Rangelands

Our objectives (already underway)

Objective 1: Develop **data-driven approaches** in the production of ecological site descriptions that guide rangeland conservation and management practices within MLRAs of the western U.S.

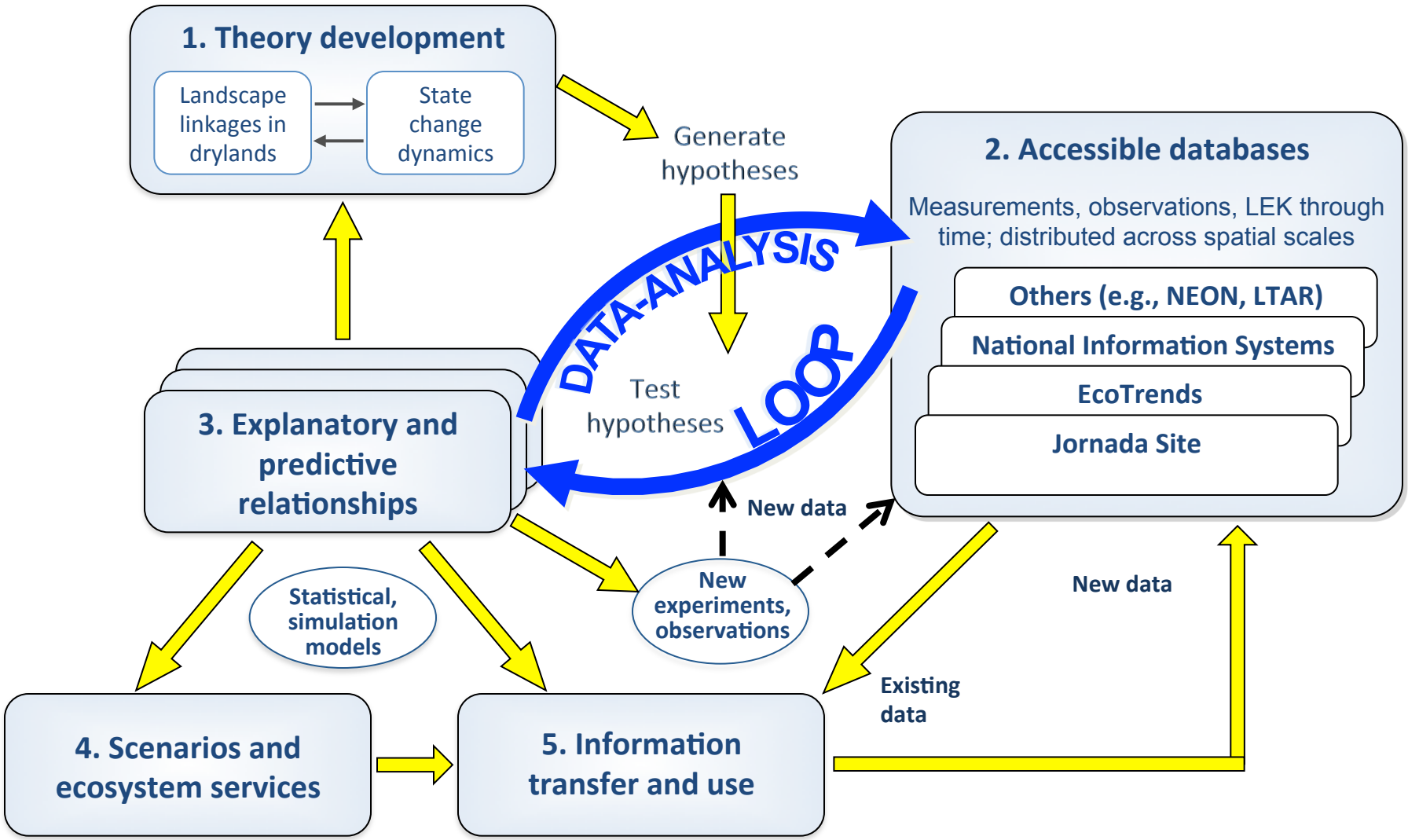
Objective 2: Improve techniques, including remotely sensed methodologies, for **rangeland monitoring and assessment** applicable to landscapes within MLRAs, and more broadly for regional and national scales of assessments.

Objective 3: Evaluate effectiveness of historic, current, and new grassland restoration practices for dominant ecological sites within specific MLRAs of New Mexico, Arizona, Oregon, and Wyoming.

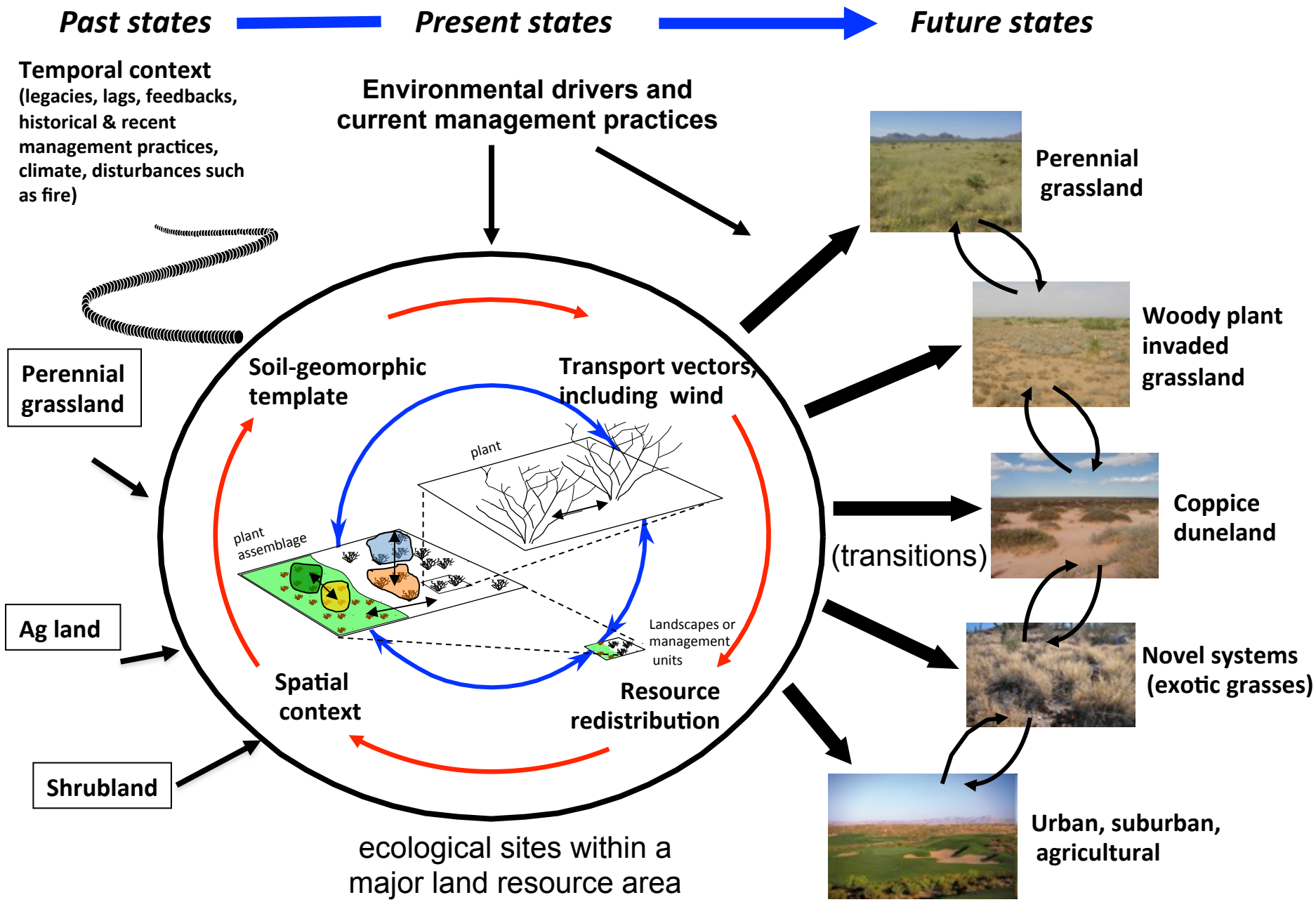
Objective 4: Evaluate livestock management practices suitable for conserving and restoring rangelands within MLRAs of the southwestern U.S.

Objective 5: Develop mechanistically based **predictions of vegetation state changes** and site-based **wind erosion susceptibilities** for landscapes within selected MLRAs under alternative land use-climate change scenarios.

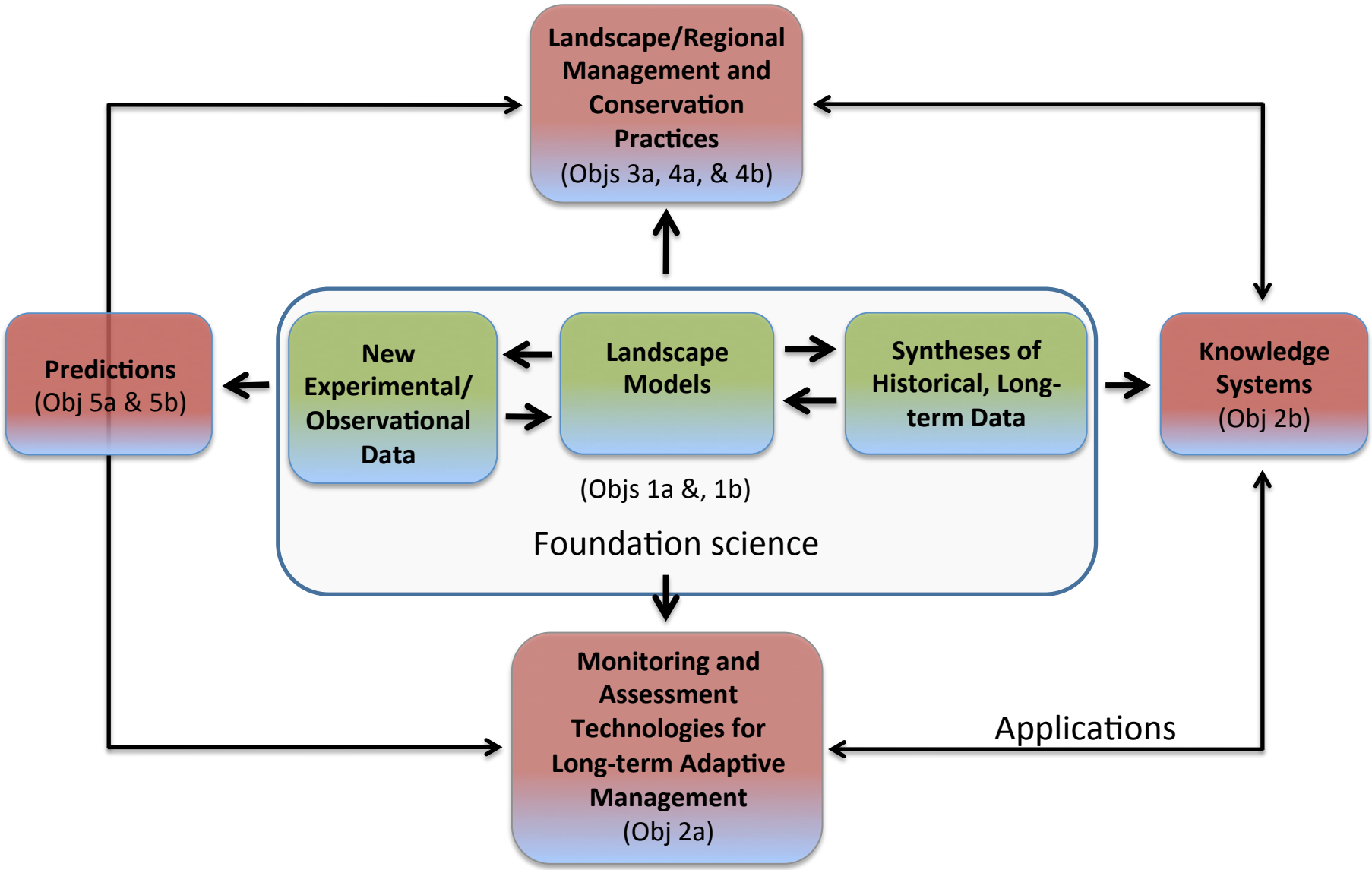
Our data-strategic scientific method



Our conceptual framework



Our emphases on both foundation science and its applications



~24 Specific Cooperative Agreements

Asombro Institute for Science Education
Bureau of Land Management, Las Cruces Office, Santa Fe State Office,
Washington DC National Office
Department of Defense, Ft. Bliss, TX. Holloman Air Force Base, NM,
White Sands Missile Range, NM
Inner Mongolian Agricultural University, Hohhot, China
Barry Levine, Portland, Oregon
Malpai Borderlands Group, Douglas, AZ
Millenium Challenge Corporation, Washington, DC
National Institute of Agriculture, Argentina
Natural Resource Conservation Service, Sanat Fe State Office,
Washington DC National Office
New Mexico State University
The Nature Conservancy, Santa Fe, NM
The Other Firm, Athens, Alabama

- ***We have a wide range of partners in implementing our research program***

Today's program

	Our Science Program (9-10:20am)	
9:00	Program overview	Kris Havstad
9:20	Jornada-based foundation science	Deb Peters
9:40	Conservation effects assessments	Brandon Bestelmeyer/Jeff Herrick
10:00	Networked activities	Havstad/Peters
10:20	BREAK	
	Technologies and Applications (10:40am-2:40pm)	
10:40	Ecological site descriptions	Joel Brown (NRCS)
11:00	Database for inventory, monitoring and assessment	Ericha Courtright
11:20	Field guides/vegetation state mapping	Laura Burkett
11:40	Unmanned aerial systems	Al Rango
12:00	LUNCH W/ STAFF	
1:00	Remote sensing applications	Caiti Steele
1:20	Landscape toolbox	Jason Karl
1:40	Novel livestock practices	Dean Anderson
2:00	Predictive models	Peters
2:20	Data portals for landscapes and projects	Scott Schrader
2:40	BREAK	The Cart Lady!!
	Outreach (3-4pm)	
3:00	Asia, South America, and Africa research projects	Herrick/Bestelmeyer/Havstad
3:20	Asombro Institute for Science Education	Stephanie Bestelmeyer (Asombro)
3:40	Land management center (proposed)	Herrick/Karl
4:00	Wrap Up	Dan Upchurch