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Reorganizing Research Teams into Integrated Project Areas (IPA) for CAP2

Central Arizona — Phoenix Long-Term Ecological Research

CAP LTER

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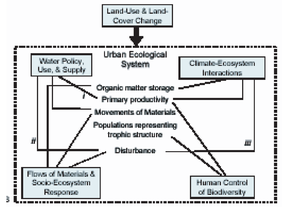
ABSTRACT

An innovative new approach to organizing research has been proposed for CAP2. Our experience in CAP1 taught us that for investigating the urban or 'designer' ecosystem, old categories must be integrated in new ways to facilitate interdisciplinary research. Therefore, the new CAP2 organization features groupings of researchers called "Integrative Project Areas (IPA)"; defined by the subject matter of our investigations, and "Working Groups," defined by the tools and approaches to the science. Each IPA intersects with one or more LTER core areas, but the new research organization aids in explicit inclusion of socioeconomic drivers and feedbacks. The five IPAs are: Land-Use and Land-Cover Change, Climate-Ecosystem Interactions, Water Policy, Use, and Supply, Fluxes of Materials and Socio-Ecosystem Response, Human Control of Biodiversity. Research teams and ongoing research projects are displayed for each Integrated Project Area and may also be reviewed at the CAP-LTER website (http://caplter.asu.edu).

INTEGRATED PROJECT AREAS

The new CAP2 organization features groupings of researchers called "Integrative Project Areas"; defined by the subject matter of our investigations, and "Working Groups," defined by the tools and approaches to the science. Relationships of IPA to the LTER core areas are shown in the figure below. I refers to landscaping experiments that focus partly on control of primary productivity through watering regimes; II the response of human water-management institutions to drought; and III the interaction of long-term climate trends and resilience of social institutions.



There is a great deal of overlap and sharing of talent among the IPAs and practical working groups (PWGs). Additional informal working groups are created to deal with immediate needs of specific projects.

PRACTICAL WORKING GROUPS

Informatics
Corinna Gries (International Institute for Sustainability)
Peter H. McCartney (International Institute for Sustainability)
Saritha Bhandarkar (International Institute for Sustainability)
Nancy B. Grimm (School of Life Sciences)
Nora Haenn (Anthropology)
Maik Netzband (International Institute for Sustainability)
Charles L. Redman (International Institute for Sustainability)
Cindy D. Zisner (International Institute for Sustainability)

Education and Outreach
Monica M. Elser (International Institute for Sustainability)
J. Marty Anderies (Life Sciences)
Nancy B. Grimm (School of Life Sciences)
James Hathaway (College of Liberal Arts and Sciences)
Ann Kinzig (School of Life Sciences)
Lauren Kuby (International Institute for Sustainability)
Kathryn Kyle (SCENE)
Charles L. Redman (International Institute for Sustainability)
Charlene Saltz (International Institute for Sustainability)
Brenda L. Shears (International Institute for Sustainability)
Milton Sommerfeld (Life Sciences)
Cindy D. Zisner (International Institute for Sustainability)

Long Term Monitoring
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Diane Hope (International Institute for Sustainability)
Nancy B. Grimm (School of Life Sciences)
Charles L. Redman (International Institute for Sustainability)
Cindy D. Zisner (International Institute for Sustainability)

Modeling
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Jianguo Wu (School of Life Sciences)
Nancy B. Grimm (School of Life Sciences)
Nora Haenn (Anthropology)
George D. Jenerette (School of Life Sciences)
Paul C. Johnson (College of Engineering and Applied Sciences)
Michael Kuby (Department of Geography)
Peter H. McCartney (International Institute for Sustainability)
John F. McIntosh (Herberger Center for Design Excellence)
Laura R. Musacchio (Dept of Landscape Architecture)
Elizabeth A. Wentz (Geography)

Long Term Experiments
Stanley Faeth (School of Life Sciences)
Diane Hope (International Institute for Sustainability)
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Knowledge Transfer
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Land-Use and Land-Cover Change

Land use and land cover define the context of the socio-ecosystem, and alterations in their patterns represent some of the most seminal changes to the system. We ask: How have land use and land cover changed in the past, and how are they changing today? How do land-use and cover changes alter the ecological and social environment in the city, and how do human perceptions of these changes alter future decision making? This understanding, in turn, sets the stage for all other IPA research.

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Elizabeth A. Wentz (Geography)

Joseph Feller (College of Law)
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Margot Kaye (International Institute for Sustainability)
Eric Keys (Department of Geography)
Ann Kinzig (School of Life Sciences)
Lauren Kuby (International Institute for Sustainability)
Laura R. Musacchio (Dept of Landscape Architecture)
Maik Netzband (International Institute for Sustainability)
Jean C. Stutz (Department of Applied Biological Sciences)
Jianguo Wu (School of Life Sciences)

Climate Ecosystem Interactions

Climate is an important driver of processes in most ecosystems. The spatial and temporal dynamics of human actions both deliberately (irrigation) and inadvertently (urban heat island) modify the urban climate. Studies of climate-ecosystem interactions will be conducted at multiple scales from single organism to regional. We ask: How does human-driven, local climate change compare with longer-term trends and/or cycles of climate in the region? How do regional drivers influence local climate as urbanization proceeds? What are people's perceptions of their local environment, including climate, and how does that affect their assessment of neighborhood or regional quality of life? What are the interactions among local management, local climate, net primary production (NPP) and vegetation processes?

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Hamdallah Bearat (Center for Solid State Science)
Corinna Gries (International Institute for Sustainability)
Nancy B. Grimm (School of Life Sciences)
Susanne Grossman-Clarke (International Institute for Sustainability)
Sharon Harlan (Department of Sociology)
Diane Hope (International Institute for Sustainability)
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Jeffrey Klopatek (School of Life Sciences)
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Charles L. Redman (International Institute for Sustainability)
Steve Swanson (Anthropology)
Joseph Zehnder (Geography / SCERP)
Cindy D. Zisner (International Institute for Sustainability)

Water Policy, Use, and Supply

Humans now appropriate 100% of the surface flow of the Salt River and are increasingly exploiting groundwater resources and surface waters from more distant basins (e.g., Colorado River). Controlled management and engineering shift the characteristic spatial and temporal variability of the hydrologic system. What are the ecological and economic consequences and potential vulnerabilities of those shifts? What institutional responses best address those vulnerabilities? Within this IPA, we examine landscape water management, water supply and delivery, riparian restoration, and resilience of the socio-ecosystem to waterrelated stress or catastrophe.

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Everett Shock (Geology/Chemistry/Biochemistry)
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Fluxes of Materials and Socio-Ecosystem Response

Material fluxes and biogeochemical linkages have been studied for decades in relatively undisturbed ecosystems, but not in urban ecosystems where human-generated fluxes of nutrients and toxins are coupled with nonhuman biogeochemistry. The main question driving the ecological research in this IPA is: How do urban element cycles differ qualitatively and quantitatively from those of nonhuman-dominated ecosystems? Nutrient, pollutant, and toxin element cycles drive our main sociological questions: What are the socio-spatial distributions of anthropogenic toxins and other pollutants in the CAP ecosystem, and what hazards to organisms (plants, animals, humans) result from these distributions? Do citizens and decisionmakers accurately perceive these hazards?

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Human Control of Biodiversity

Ecological approaches to studying human control of biodiversity have typically focused upon habitat loss and disturbance brought about by humans at high population densities. We will move beyond these approaches to ask: How do human activities, behaviors, and values change biodiversity and its components-population abundance, species distribution and richness, and community and trophic structure? In turn, how do variations in biodiversity feed back to influence these same human values, perceptions, and actions?

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