Redesigning ASU: A Focus on Sustainability

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Outline for today’s talk

• Why study sustainability?
• Why focus on rapid urbanization?
• Why Phoenix? Why ASU?
• Why reorganize the university?
Sustainability:
Treating the Earth as if we intended to stay
Millenial Challenges (By 2015)

1. Eradicate poverty and hunger
2. Universal primary education
3. Seek gender equality
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria, and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for economic development
Challenge of global climate change

- (Slowly) growing recognition that climate crises are coming (quickly)
- Next generations “get it”
- They’re the market for a School of Sustainability
To build a sustainable world:

• Balance economic, social, & environmental systems
• Reconcile development and environmental goals
• Avoid irreversible commitments that constrain future
Why focus on rapid urbanization?

- More than half of the world’s population lives in cities
- World’s urban infrastructure must double in 35 years
- Little science input on how to make cities sustainable
- Climate change driven increasingly by urban activities
- Urban impact growing on all undeveloped lands
- Decision-making process not understood scientifically
Why study urban sustainability in Phoenix?

- 5th largest, 2nd fastest-growing city in USA
- Geography, climate, hydrology, history easy to model
- Several large federal environmental research projects
- Global relevance: drought, heat island, mass migration
- *If we can’t figure out how to make a well-off city work, we’ll never solve problems in developing world*
What are ASU’s urban research assets?

- CAP-LTER, one of two Urban LTERs
- Two urban ecology IGERTs (NSF)
- Agrarian-urban transitions (NSF)
- Decision Center for a Desert City (NSF)
- 100 Cities remote sensing (NASA)
- Urban Fluid Dynamics (ADEQ, EPA)
- Morrison Institute for Public Policy
- Nat. Ctr Excel. in SMART materials (EPA)
- Consortium for Science, Policy & Outcomes
CAP is one of only two Urban LTERs

*LTER network allows cross-site comparisons*

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**Phoenix**
- young city
- rapid growth
- arid climate
- rugged topography

**Baltimore**
- old city
- slower growth
- humid climate
- flat terrain
Underlying CAP-LTER research questions

How does urbanization alter city’s ecological context?
How does ecological context affect urban development?
CAP-LTER 200 Point Survey

Uniform data collected regularly
Analyze complex human impacts on cities

- Hydrologic modifications
  - Land cover changes
  - Manipulation of water source, amount, quality
  - Simplification of flow-paths

- Chemical modifications
  - Enhanced N, C deposition
  - Addition of pollutants
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Decision Theater: Making university research accessible to policy makers

Reception

Lobby

Boardroom

Theater
Decision Theater: Current Projects

- Water supply and demand
- Infrastructure planning
- Urban heat island
- Tracking air pollution
<table>
<thead>
<tr>
<th>Sponsor</th>
<th>Objective</th>
<th>Tools</th>
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<tbody>
<tr>
<td>Decision Center for a Desert City, National Science Foundation</td>
<td>Developing a Comprehensive Water Model for Phoenix</td>
<td>System Dynamic Simulation Model; GIS</td>
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Forecasting water supply and demand
Dynamic water supply and demand model
Decision Theater Application:
East Valley Water Forum

What are the effects of coordinating water withdrawal and recharge policies among different cities?

Global Institute of SUSTAINABILITY AT ARIZONA STATE UNIVERSITY
http://sustainable.asu.edu/
In the Fall of 2007, the first group of undergraduate and graduate students at the School of Sustainability will embark on a unique educational odyssey. These students are our future leaders in the struggle to achieve sustainability in the face of challenging environmental, economic, and societal needs.

The School of Sustainability, together with the Global Institute of Sustainability, will engage students in new academic and research programs that embody:

- Collaborative Learning
- Interdisciplinary Approaches
- Problem-Oriented Training

> About the School
> About the Global Institute of Sustainability

http://www.schoolofsustainability.asu.edu
School of Sustainability

Educating a new generation of leaders to address the environmental, economic, and social challenges of the 21st century through:

- collaborative learning
- interdisciplinary approaches
- problem-oriented training
School of Sustainability Degrees

Undergraduate
• Bachelor of Arts (B.A.) in Sustainability
• Bachelor of Science (B.S.) in Sustainability
• Minor in Sustainability

Graduate
• Master of Arts (M.A.) in Sustainability
• Master of Science (M.S.) in Sustainability
• Doctorate (Ph.D.) in Sustainability

Graduate Certificate Program
What are the challenges to institutional redesign for promoting sustainability?

- Sustainability problems require intense interdisciplinarity
- Pushing the limits of institutional flexibility
- Which degrees are better for which kinds of jobs?
- How to distribute resources (faculty lines, raises, T.A.s)?
- How much inter-institutional competition is healthy?
- Where should sustainability be housed?
Why are we encouraged that this experiment will work?

• Context: 14 schools launched at ASU in past 4 years
• Interdisciplinarity emphasized in internal reward system
• Builds on experience of five NSF IGERTs
• 2004 input from world’s leading sustainability experts
• Industrial partners looking for these kinds of graduates
• Students very enthusiastic about existing courses