



The Formation of Centers and
Institutes as the Nucleus for
Interdisciplinary Research: Success
Stories and Cautionary Tales

Committee on Research Institutions



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Interdisciplinary Centers: Keys to Success and Challenges

Jeffrey Hecker

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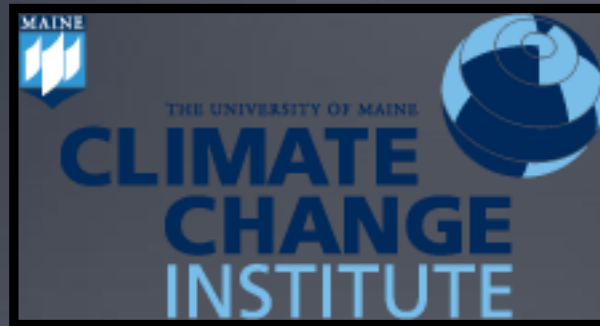
CCAS, 2011

Interdisciplinary Centers: Outline

- Introduce four interdisciplinary centers
- Keys to success
- Challenges



The Centers



Established in 1972 as the Institute for Quarternary Studies with five jointly appointed faculty (2 Biology, 2 Geology, 1 Anthropology)

2011 – there are 52 faculty and 38 graduate students involved in the CCI.

Faculty are jointly appointed (n = 15) or cooperating.

Last year brought in \$10.5M in external funding.

CCI is a “fully matured interdisciplinary research center”

THE CLIMATE CHANGE INSTITUTE is an interdisciplinary research unit organized to conduct research and graduate education focused on variability of Earth's climate, ecosystems, and other environmental systems and on the interaction between humans and the natural world.



Established in 1980

Currently faculty from Chemistry, Physics, Microbiology, Electrical Engineering, Mechanical Engineering, Chemical Engineering, and Computer Science.

12 faculty with joint or cooperating appointments.

7 Research Scientists or Engineers

UMaine's Laboratory for Surface Science & Technology (LASST) plays a major role in educating and training the next generation of scientists and engineers while carrying out interdisciplinary research projects and technology transfer activities in the areas of surfaces and interfaces, thin films, microelectronic devices, sensor technology, and nanotechnology.



Formed in 2000-01

Physics professor and dean worked together to secure \$1.23M earmark.

Two math and two physics faculty hired with expertise in science education.

Currently 16 faculty with cooperating appointments in center.

2009 received \$12.6 M NSF grant to form Maine Physical Science Partnership.

The Maine Center for Research in STEM Education (The Maine RiSE Center) provides an integrated approach to University-based research and professional development in science and mathematics education. The Center is a joint effort of the College of Liberal Arts and Sciences, College of Education and Human Development and College of Natural Sciences, Forestry and Agriculture. The activities of the Center bring together faculty from the science and mathematics disciplines with faculty from education. With this combination of resources, the Center is reevaluating and reforming introductory level science and mathematics courses, establishing new practices for K-12 science teacher preparation, and building infrastructure with teachers, schools, and administrators through out the state.

MAINE'S SUSTAINABILITY SOLUTIONS INITIATIVE



Connecting knowledge with action to strengthen our economic, social & ecological future

Formed in 2009.

Not yet a center – but creation of Center for Sustainability Solutions is goal.

Received 5-year \$20M grant from NSF to Maine-EPSCOR.

Collaboration with every institution of higher education in Maine.

30 UMaine faculty are involved in SSI

SSI Mission: To connect knowledge with action in ways that promote strong economies, vibrant communities, and healthy ecosystems in and beyond Maine. **Vision:** Create a Center for Sustainability Solutions that searches for, implements, and evaluates policies and practices that promote economic development while protecting ecosystem health and fostering community well-being. **Overall Research Goal:** Create a world-class sustainability science research program focused on the dynamics of social-ecological systems (SES), with an explicit goal of understanding and strengthening connections between knowledge and action (K-A).

Keys to Success

Keys to Success: It's Money That Matters

- Not too much and not too soon.
 - Base funding matters.
 - External funding matters more.
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Keys to Success: Leadership

- Passion for mission
 - Vision
 - Credible
 - Energetic and tireless advocate for center's mission
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Keys to Success: Participants

- Passion for the mission
 - “Like minded but not alike”
 - Recognize that mission is bigger than them (or their discipline)
 - Tolerance for ambiguity
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Keys to Success: Common Culture

- Importance of shared mission
 - Explicit values
 - Shared space
 - Rituals
 - Attention to process
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Keys to Success: Students

- Owning a degree program
 - Integrates mission with the university's mission
 - Students (particularly undergraduate) are less hung-up about disciplinary boundaries
 - Students can encourage best behavior
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Keys to Success: Joint Appointments

- Co-ownership of faculty line can protect faculty
 - Joint peer committee
 - Formalizing cooperating appointments
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Keys to Success: Support of Administration

- “but not too much”
 - Financial support
 - Operational support
 - Promotional support
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Challenges

Challenges: Promotion and Tenure

- Should pretenure faculty be involved?
 - Joint peer committees and MOUs
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Challenges:

Who's in and who's out

- How to make it easy for like-minded faculty to join the center?
 - How to get someone out who loses passion for mission, doesn't play nice, is miserable or unproductive?
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Challenges: Who gets credit?

- For grants
 - For publications
 - Who controls the money?
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Challenges: Are we big enough yet?

- Managing growth
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Challenges: Director for life?

- Strong leadership can invite complacency among participants.
 - Is there a mechanism for leadership change?
 - Is the next leader being developed?
 - Advancing the mission, not the leader.
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Concluding comments: Some thoughts about dean's role

- Be a spark, not a forest-fire.
 - “Fail fast, fail cheap” (and learn on the way).
 - It's true you can't herd cats, but they do like treats.
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An Interdisciplinary Center Case Study

Christopher McCord, Dean
College of Liberal Arts & Sciences
Northern Illinois University



Institutional Profile

NIU is a RU(H) with approximately 17,000 undergraduates, 6,000 graduate students

NIU became a university in 1957

Undergraduate/Graduate Colleges of Business, Education, Engineering, Health & Human Sciences, Liberal Arts & Sciences, Visual & Performing Arts

Research agenda focused primarily in CLAS, CEET

External Funding approximately \$15M/yr



Institute for Nano Science, Engineering and Technology



Founded in 2002 to leverage three synergies:

- Faculty strengths distributed across multiple departments
- Proximity of Argonne National Laboratory
- Dennis Hastert



InSET

- 24 faculty affiliates from NIU: Chemistry (6), Computer Science (1), Physics (9), Electrical Engineering (3), Mechanical Engineering (5)
- 5 affiliates from Argonne National Laboratory
- Facilities include clean room in CEET, individual labs in CHEM & PHYS
- Graduate student fellowship program funded by Vice President for Research



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- 24 faculty affiliates from NIU: Chemistry (6), Computer Science (1), Physics (9), Electrical Engineering (3), Mechanical Engineering (5)
- 5 affiliates from Argonne National Laboratory
- Facilities include clean room in CEET, individual labs in CHEM & PHYS
- External Funding: ~5 awards/yr, worth ~1M/yr
- Graduate student fellowship program funded by Vice President for Research



InSET History

- 2002: InSET created by entrepreneurial & charismatic emeritus faculty member in PHYS
- 2002 – 2006: InSET receives significant congressional earmark support, distributed by director to individual PI's
- 2004: InSET established as center reporting directly to VPR
- 2008: InSET targeted by VPR as multi-disciplinary research cluster, w/ focus on partnership & joint hires with ANL



InSET History

- 2008: VPR leaves NIU; Congressional earmarks recede
- 2009: Search for director fails, relations w/ ANL strained
- 2010: New VPR arrives, conducts external review of InSET & identifies narrower focus for mission & stronger benchmarks for success
- 2011: Hiring plan focused on joint hires w/ ANL moves forward



Some Lessons Learned

- Charismatic leaders and earmarks can both be valuable, but both need succession planning
- Know how to recognize success & failure
- Make sure you've got your act together before you engage with external partners; be realistic about what you can bring to such partnerships
- Have solid policies and practices for supporting joint hires, and for sustaining an interdisciplinary organization

