

STRATEGIC PLAN 2013-2018 JULY 2013



Role of the Prairie Research Institute in Meeting the Needs of Society



EXECUTIVE SUMMARY

The Prairie Research Institute is a unique and world-class multi-disciplinary unit of the University of Illinois at Urbana-Champaign; it provides research, expertise, and data on the natural and cultural resources of Illinois to benefit the state's economy, environment, and people. There is no comparable entity in any other state or university. Science and solutions developed here are adopted throughout the world.

Institute researchers integrate scientific knowledge, field expertise, and collaborative partnerships to provide objective, business- and policy-relevant research and information. As specified in statute, the Institute is the research arm of the state of Illinois, and provides anticipatory research, long-term data collection, and a capacity for rapid deployment and response to sudden or unexpected circumstances.

In 2013, the Institute, in its various forms, marks 162 years of service and five years since its administrative transfer from state government to the University of Illinois. To assess alignment within the university and the status and needs of its staff and constituents, the Institute convened visioning sessions with staff, faculty, and external stakeholders and undertook a strategic planning process. The assessments show an urgent and enduring need for the Institute's research and services. This five-year strategic plan identifies immediate and longer-term measures that maintain and enhance the personnel, facilities, information, and other scientific assets that are fundamental to conducting this work at the scope, scale, and quality needed to meet these needs.

Specifically, the plan:

- Assesses the Institute's strengths, weaknesses, uniqueness, and value to its most important constituencies, including the state of Illinois, the University of Illinois, and public and private sector users of its research and data
- Identifies threats, opportunities, and trends related to the Institute's ability to carry out its mission now and in the future

- Specifies an integrated suite of goals, objectives, and strategies that address opportunities and deficits, organized into four overarching goals that encompass the Institute's output and operations:
 - Knowledge
 - Service
 - Visibility
 - Capacity
- Establishes a framework for implementation of the plan, including developing and allocating resources and monitoring progress

Key outcomes and components of the plan include:

- Increased scientific collaboration across units within the Institute and university, and with external partners. Expanded Institute-wide research themes will provide an enhanced framework for interdisciplinary collaboration and deployment of expertise
- Intensive, additional integrated effort to increase the visibility and awareness of the Institute's work and value among its constituents, including state legislators and industry
- A succession plan for senior administrative and scientific leadership, and increased focus on professional development across the Institute. A key component is an immediate call to establish a viable promotion and personnel classification system to fit the Institute's needs

Implementation of this Strategic Plan will be a concerted effort across Institute management and staff. It will require additional details, timelines, milestones, assignments, and oversight and will need to be a priority for all in order to be accomplished in a timely manner. To be fully realized, strong support from campus is needed and new grants and other sources of funding must be secured.

1. INTRODUCTION

The Prairie Research Institute marks its fifth year as part of the university on July 1. This Strategic Plan addresses the next five years, 2013-2018. The overarching objectives of the plan are to:

- Set direction and paths for the successful evolution of the Institute and Surveys over the next five years
- Address strategic issues critical to meeting the mission and pursuing the vision of the Institute
- Establish research priorities and ensure effective use of resources to meet the statutory requirements and service expected by the state and other constituents
- Align Institute and Survey management and staff around common goals and vision
- Support university and Urbana campus strategic direction where aligned with the Institute's strategic direction
- Further the understanding of the Institute as a strategic asset to the university and the state

Staff in the Office of the Executive Director (OED) coordinated the planning process and document preparation. A Core Team comprising the Survey Directors and senior scientific staff advised OED staff, met for discussion, and reviewed drafts.

We sought out and received input through visioning sessions with Institute staff, faculty and staff on the Urbana campus, and external constituents gathered in Chicago and Springfield. Institute staff also had the opportunity to complete an online survey. Visioning sessions and the survey were facilitated by the university office of the Associate Provost for Strategic Planning and Assessment. A summary of all stakeholder input can be found in Appendix 1. The questions addressed were:

- · What are the key strengths of the Institute?
- What are the real or perceived weaknesses or things that need to be changed?
- · What are the emerging issues or scientific

challenges on the horizon that the Institute should prepare to address? What do we do to prepare?

- What are the key success factors required to meet these challenges?
- What are the top five priorities among these issues?
- What other opportunities do you see for the Institute?

At the request of the Vice Chancellor for Research, this is a high-level strategic plan to guide direction and leadership and demonstrate strategic alignment with campus. Further details will be covered in an implementation plan.

2. VALUE PROPOSITION

The Prairie Research Institute is a world-class multidisciplinary unit of the University of Illinois that provides a unique balance of research, expertise, and data on the natural and cultural resources of Illinois to benefit the state's economy, environment, and people. There is no comparable entity in any other state or university. Institute scientists and engineers pursue basic and applied research and provide objective, integrated, practical advice to public and private sectors. Our researchers encompass a wide breadth of expertise and draw upon over 160 years of collections, records, and data sets. The Institute and Surveys are known in Illinois, nationally, and internationally for anticipating issues, being responsive, and producing timely, actionable, objective research and information of the highest quality.

The Institute has pursued its mission since 1851. With the same visionary leaders¹ and intellectual tradition as the subsequent Morrill Act of 1862, this mission remains vital and relevant today. The way that mission is fulfilled has evolved and will continue to evolve to utilize advances in science and technology and meet ever-changing needs. The economy, environment, and the public all benefit when decision-makers and citizens have accurate, actionable knowledge about natural and cultural resources. Organizing this expertise and data collection in the Prairie Research Institute ensures that scientific capacity, service, and data coverage is delivered in a cost-effective and integrated manner.

The Prairie Research Institute fulfills critical roles for the three constituencies it serves: the state of Illinois; the University of Illinois; and the scientists, agencies, local governments, industries, and public who utilize and benefit from its products and services.

1. State of Illinois

The Institute and Surveys were established with statutory requirements to provide timely,

Figure 1: Role of the Prairie Research Institute in Meeting the Needs of Society



There is continuing public need for organizations that bridge the gap between the producers and users of scientific knowledge. University science is typically confined to the science domain. Organizations such as Cooperative Extension occupy the boundary between science and user domains, but have little independent research capacity. The Prairie Research Institute integrates science/research and "boundary" functions to deliver targeted, relevant science. Adapted from Turnhout, E., Hisschemoller, M., & Eijsackers, H. 2007. Ecological indicators: Between the two fires of science and policy. Ecological Indicators 7:215–228f

credible, relevant, objective science to inform resource management decisions in Illinois. In addition, agencies such as the Illinois Department of Transportation and Department of Natural Resources contract with the Institute for missioncritical research and assessments. Effectively, we are the research arm of the state of Illinois. In FY2012, \$15.8 million in General Revenue Funding expenditures leveraged \$64.6 million in grants, contracts, and other funding, for a total of more than \$80 million, a 4:1 direct return on the legislature's investment.

Institute projects and programs deliver science and services tailored to decision-makers, saving lives, dollars, and resources. In addition, Institute scientists, data, and collections act as a reservoir of knowledge and expertise that can be rapidly deployed to inform and respond to unforeseen and evolving resource issues such as natural disasters,

¹ Jonathan Baldwin Turner, the father of the Morrill Act, was the inaugural president of the Natural History Society of Illinois, parent entity of the Prairie Research Institute's Illinois Natural History Survey.

(flood, drought, invasive species), economic development opportunities (e.g., FutureGen), or policy developments (legislation, regulation).

2. University of Illinois

In the spring of 2013, the Urbana campus adopted a vision statement:

Together, we will be the preeminent, public research university with a land grant mission and global impact,

and the following shared goals:

- Scholarship, discovery, and innovation
- Transformative learning experiences
- Societal impact.

The Prairie Research Institute aligns strategically with the University's vision and goals and adds unique, essential value. We exemplify the land grant mission. The Institute's projects garner national and international attention, and our potent and measurable impacts at the local and state levels address the university's goal of societal impact by providing direct service to the state. The Institute's diverse clients and stakeholders offer new partnerships for the university. Our expertise in applying science to societal problems; experience with industry and economic development projects; well-established network of constituents throughout state and local government and the private sector; extensive scientific physical collections and databases; and ability to employ hundreds of students, offer additional complements to the academic and educational strengths of the University.

With an enduring mission to address societal challenges, Institute researchers are already active in the six focal areas identified in the University's Campus Visioning process: energy and the environment, health and wellness, social equality and cultural understanding, education, information and technology, and economic development.

3. Public and private sector clients and the public

The Institute's defining characteristic is its researchers' ability to integrate scientific knowledge, field expertise, and collaborative partnerships to provide objective business- and policy-relevant research and information. By engaging with industry, local governments, and other decision-makers, we produce science that can be used immediately to improve understanding, inform decisions, and manage the state's resources. Signature historic² and continuing³ accomplishments have firmly established the Institute's reputation for objectivity, excellence, innovation, and service. Institute scientists and stakeholders agree that its most highly valued services are anticipatory research, long-term data collection, and capacity for rapid deployment and response to sudden or unexpected circumstances.

² e.g., developing what became the national network of Doppler radar, pioneering and managing modern agricultural pest control. See prairie.illinois.edu for capsule histories of the Surveys.

³ e.g., Illinois Basin – Decatur carbon sequestration project, Asian carp, water supply planning. See prairie.illinois.edu/ pdf-files/annual-rept-fy12.pdf for an extended summary of current work.

3. SITUATION ANALYSIS

The Prairie Research Institute comprises the Illinois State Scientific Surveys, which are applied research, data, and service organizations established by the state of Illinois beginning in 1851. The State legislature and the university established the Prairie Research Institute in 2008 when the scientific Surveys were administratively transferred from the Illinois Department of Natural Resources to the University of Illinois Urbana-Champaign campus. Within the university, the Prairie Research Institute is located in the Office of the Vice Chancellor for Research.

The Institute employs 1,000 scientists and support staff, including 140 PhDs and more than 250 students each year. They work at 40 locations on campus and in the Champaign-Urbana area and in more than 30 facilities and field stations around the state. The Prairie Research Institute is the largest institute on campus in terms of staffing and budget. Of these staff, 194 FTEs are paid on state appropriations, and they provide critical leadership and support for the science and service functions of the staff. The remaining staff are funded directly or indirectly on grants, contracts, and gifts.

Over the course of the next five years, senior leadership and key scientist retirements are anticipated across the Institute, including most of the Scientific Surveys. Succession planning is therefore of paramount importance.

The 2008 creation of the Institute and transfer to the University of Illinois opened up opportunities for increased collaboration and integration among the Surveys, and between the Institute Figure 2: Office of Vice Chancellor for Research Institutes, Staffing Levels



OVCR Institutes

Staff FTEs and Hourly Headcounts, FY08-FY12

Figure 3: Office of the Vice Chancellor for Research Institutes, Grant and Contract Expenditures, FY2008-12. The Prairie Research Institute's substantial grants and contracts with Illinois state agencies are a relatively unique funding stream within the University.



and the university. One objective of this strategic plan is to identify and plan measures that build on Institute strengths and complement university strengths, to more effectively pursue shared Institute and university goals.

In the past two years, the university and the Urbana campus have undergone significant changes in leadership, including a new Vice Chancellor for Research, who oversees the Institute, presenting an opportunity for a fresh consideration of the Institute's current and future role as a major asset within the university.

State general revenue funding for the Institute has declined by half since its inflation-adjusted peak in the early 1970s. Growth in grant and contract funding has more than offset that loss, but state general revenue funding is fundamental to the Institute's ability to meet its statutory mandates and to provide what its scientists and stakeholders agree are its most highly valued services: anticipatory research, long-term data collection, and capacity for rapid deployment and response to sudden or unexpected circumstances. State funding is also critical to meet the match requirements of the many federal contracts that come through the state to the Institute. This strategic plan calls for a suite of objectives and strategies aimed at maintaining a broad mix of scientific expertise and securing the necessary resources through a range of communication, policy, and development strategies.

The Institute is fortunate that state appropriations have remained constant over the past five years. This level of support cannot be assumed to continue without the widespread support of decision-makers across the state for the value of the responsive and relevant service and applied research of the Institute.

Strengths, Weaknesses, Opportunities, Threats

Informed by the staff, faculty, and stakeholder visioning process, we developed a "SWOT Analysis" summarizing strengths, weaknesses, opportunities, and threats. A summary appears as Appendix 2 and was used to develop and shape the goals, objectives, and strategies.

Scientific Priorities

The Institute's research and services address a range of societal needs that cluster around seven themes: advancing clean energy, managing water resources, supporting agriculture, protecting the public, stewarding natural and cultural resources, and guiding transportation development. Additional scientific challenges and emerging issues that were raised by the Core Team and visioning sessions include climate change and its impacts; groundwater quantity, quality, and use; biodiversity; alternative energy; land stewardship; "Big Data"/ data visualization; and public policy development. See Appendix 1.

4. PRAIRIE RESEARCH INSTITUTE FIVE-YEAR STRATEGIC GOALS

This section outlines goals, objectives, and strategies that the Prairie Research Institute will deliver through implementation of the strategic plan. For clarity and organization purposes, the integrated research and services provided by our scientists and support staff have been partitioned between goal 1 (knowledge) and goal 2 (service). In this context, "service" encompasses scientific activities such as monitoring, data collection, and curation as well as providing assessments, decision support, and targeted advice. Goal 3 (visibility) includes a suite of objectives related to making the Institute and its work more visible and better understood. A large part of that visibility and understanding arises directly from our scientists' and staff's work with constituents and partners reflected in goals 1 and 2. With a new organizational structure and a new administrative home, visibility and understanding also require the proactive and coordinated effort at communications reflected in goal 3. Goal 4 is where objectives and strategies related to staffing, leadership, administration, facilities, equipment, and funding of the Institute are addressed.

Goal 1. Knowledge

Enhance scientific knowledge through research applied to scientific and societal challenges

Objectives:

- Anticipate and meet the scientific needs of our constituents
 - Sustain and enhance the Institute's core research and expertise
 - Define priorities based on mandates, constituent needs, and emerging issues
 - Enhance interdisciplinary research across the Surveys
 - Better serve the Chicago Metropolitan area
- Improve and expand research through collaboration
 - Expand relationships with faculty, researchers, and students on the Urbana campus and at other universities

- Support bioengineering, biomedical, and other campus research strengths by providing broader environmental and public health and safety contexts
- Leverage connections with UIC to expand Chicago work and with UIS to expand participation in public policy
- Expand relationships with potential clients and partners in government, private sector, and non-governmental organizations
- Collaborate with national and international research units
- Provide more opportunities for postdoc positions
- Develop an adjunct program for Institute staff in other campus units and for campus faculty in the Institute
- Increase graduate and undergraduate participation in Institute research
- Provide more opportunities to students to conduct master's- and PhD-level theses/ research projects
- Increase student employment opportunities (including fellowships and assistantships) that provide basic and applied research experiences on the Urbana campus
- Enhance coordination of Institute-wide research themes that bring to bear the combined strengths of the Surveys, such as
 - Energy assessing conventional and new energy sources and technologies, including ones that reduce environmental impacts, energy efficiency and conservation practices, deployment of renewables, and water supply for energy applications
 - Water Management state-wide planning for supply and quality as well as flooding and drought, climate change impacts, aquatic invasive species, river ecology, sedimentation, water treatment technologies and practices

- Climate Adaptation assessing impacts of and responses to societal demands for water, energy, land, and other infrastructure; shifts in agricultural production; and changes to terrestrial and aquatic habitat for fish and wildlife; adapting transportation, water and wastewater infrastructure to extreme weather, flood, and drought hazards
- Data integration developing the infrastructure to allow integrated analysis of large biological, geological, hydrological, climatological, archaeological, historical, and socio-economic data sets

Goal 2. Service

Build on the Institute's extensive data, information, and service to support science, policy development, and decision-making

Objectives:

- Anticipate and meet the data, information, and service needs of our diverse constituents
 - Enhance interdisciplinary data, information, and service across the Surveys
 - Improve delivery of data, information, and service tailored to the needs of our diverse constituents
 - Refine the delivery model for meeting local needs
 - Increase the accessibility of Institute data and collections through digitization, web-based and mobile technology, and other data stewardship initiatives
- Improve and expand data, information, and service through collaboration
 - Expand relationships with faculty, researchers, and students from the Urbana campus and other universities
 - Leverage connections with UIC to expand Chicago work and with UIS to expand participation in public policy
 - Expand relationships with potential clients and partners in government, private sector,

and non-governmental organizations

• Collaborate with national and international research units

Goal 3. Visibility

Enhance visibility and understanding of the Institute

Objectives:

- Take a more active role in campus initiatives and with faculty and researchers in allied disciplines
 - Work with OVCR to facilitate the Institute's role and participation
 - Improve contacts with individual faculty and campus programs
 - Contribute to campus efforts to expand applied research activity
 - Share expertise to become the recognized campus resource for basic and applied research, data, and service in natural and cultural resources
 - Establish relationships with and provide expertise and services to top administrators who manage natural and cultural issues for the campus and university
- Develop a strategic communications and marketing plan for the Institute
- Develop an Institute-wide strategic vision for outreach, public engagement, and public education that serves the state's diverse population
- Develop an external affairs plan including constituent relations (director position being filled)
- Explore creation of a public Science Center in Champaign-Urbana with allied partners to share our scientific work and information year-round, provide science education, and promote science careers
- Increase professional activity beyond campus
 - Participate in more professional societies
 - Increase scientific publishing across the Institute

Goal 4. Capacity

Ensure effective staffing and leadership, efficient administration, modern facilities and equipment, and adequate funding to support the work of the Institute

Objectives:

- Develop a staffing system that supports the unique nature of the Institute
 - Increase diversity among Institute staff where underrepresented
 - By December 31, 2013, obtain executive-level university approval of a functional staffing system that addresses classification, promotion, and career path issues within the Institute
 - Establish a professional development program across the Institute including mentoring
 - Review and update annual performance review and work plan process
- Ensure an optimum level of stability, evolution, and growth for the Institute
 - Develop a succession plan for Executive Director, Associate Executive Director, and Director positions
 - Develop a succession framework across the Institute
 - Incorporate leadership development opportunities into the operational and organizational structure of each Survey
 - Conduct assessments of each Survey and major initiatives on a regular basis
- Deliver a high level of administrative service while improving efficiency
 - Review technical and IT service and support
 - Periodically review the shared services approach to administration

- Secure stable, diverse, and growing funding for the Institute
 - Maintain base funding from the state
 - Expand dedicated state funding
 - Work with the Office of the Vice Chancellor for Institutional Advancement to develop Institute advancement programs
 - Work with the Office of Corporate Relations to develop an industrial research partners program and other initiatives
 - Expand grant and contract funding
- Provide essential facilities and equipment to produce outstanding science
 - Modernize scientific equipment and maintain and expand monitoring networks
 - Establish proper facilities for storage and utilization of the Institute's world-class physical collections

5. ALLOCATING RESOURCES

Budgets (Funding the Institute)

A realistic and flexible funding plan is needed to sustain core programs, allocate existing resources, enhance capabilities, and undertake and incentivize new efforts as envisioned in this plan over the next five years. Cost estimates of these strategies and appropriate funding sources will be identified by the implementation team. Goals and strategies include:

- Continuation of existing state appropriations, including special funds
- Maintenance of ICR at least at the current allocation (44%) to the Institute
- Increased grant and contract funding from local, state, and federal partners
- Continued campus support including for spousal hires and postdoc programs
- Participation in campus advancement programs to increase private funding
- Creation of one or more new revenue streams
- Savings from administrative efficiencies and other initiatives

We anticipate base funding of \$15.8 million from GRF. Increased costs for raises and operations necessitate additional funding to maintain current staffing and programs.

During the annual budget process, the Executive Director will determine commitments of funding, space, and staff for each of the strategies identified in this plan.

Sources

• Efficiencies and reallocations – some funds will be pooled to match OVCR funds for seed funding of research and for multidisciplinary research projects addressing priority topics, including energy, water, climate adaptation, and data and information. ICR and other funds will also be allocated to address other aspects of this plan, including upgrading of facilities, modernizing equipment, and addressing data collection and curation needs.

- University administration reallocations includes requests to support hiring of strategic postdoc positions, matching funds for seed funding research projects, and assistance with non-recurring investments in research equipment, facilities, and start-up packages for joint hires
- Partnerships includes joint funding of initiatives (e.g., CyberGIS) and strategic hires
- Grants and contracts large, innovative research efforts across the Institute and with partners will be facilitated and supported in order to secure new sources of funding. Some existing large grants are winding down (e.g., new Mississippi River Bridge and Illinois Basin – Decatur geologic carbon sequestration with ADM), which may result in decreases in existing grant funding if other opportunities are not realized.
- Philanthropy targeted to funding endowed scientific positions, modernizing scientific equipment and monitoring networks, research experiences for students, and outreach activities

Estimated costs of actions

To be established as a part of the funding plan

Staffing

A staffing plan will be created that identifies key areas for investment and hiring of research staff.

Space/Facilities

Existing space utilization will be reviewed in terms of adequacy, needs, and opportunities, including modernization, facilitating multidisciplinary collaboration, consolidation of field offices, reduction in rental costs, and collaboration, in particular, with Cook County and UI Labs.

6. IMPLEMENTATION

Implementation of this Strategic Plan will be a concerted effort across Institute management and staff. It will require additional details, timelines, milestones, assignments, and oversight. It will need to be a priority for all in order to be accomplished in a timely manner.

Once the Strategic Plan is agreed upon, an Institute-wide Implementation Plan will be set with action plans for specific goals and strategies.

An Implementation Team will be established for development and oversight.

APPENDIX 1. SUMMARY OF INPUT FROM ALL STAKEHOLDERS

Summary of input of all stakeholders from campus faculty and staff, external, and Institute staff visioning sessions and Institute staff survey prepared by the facilitator, Stig Lanesskog, Associate Provost for Strategic Planning and Assessment

Strengths

Unique mission

Depth of expertise

Perceived objectivity

Amount and time series of data/collections

Level of responsiveness/willingness to be helpful

Reputation, especially with external stakeholders

Ability to leverage resources across Institute units

Weaknesses

Increase awareness of the Institute and its units

Improve collaboration/coordination across Institute units

Define the role of the Institute central organization

Increase focus on local issues

Develop a sustainable funding model

Strengthen partnerships with university

Develop succession planning/career pathing at all levels

Invest in facilities and maintenance of collections/ data

Scientific Challenges/Emerging Issues Climate change and its impacts

Ground water quantity, quality, and use

Biodiversity

Alternative energy

Land stewardship

"Big Data"/data visualization

Public policy development

Priorities

Align the priorities of the Institute units

Better communicate about the Institute, its value and impact

Improve connection with campus

Enhance staff recruitment and professional development

Address succession planning

Develop a sustainable funding model

Maintain mission of the Institute while increasing the focus on local issues

Key Success Factors Improve communication and visibility

Better engage with external stakeholders, including legislators and other public "champions"

Balance the "purity" of the science performed with the reality of the need to generate revenues

Clarify the role of the Institute within the university

Align the priorities of the Institute units

Align incentives to the priorities

Address succession planning and internal HR needs

APPENDIX 2. SWOT ANALYSIS

Internal Factors

Strengths

Quality and breadth of staff expertise

Long-term reputation for high-quality, objective service and science for the state

Recognized expertise in applying science to realworld problems

Long-standing, nationally significant environmental monitoring projects

Well-established relationships throughout state and local government and the private sector

Extensive scientific physical collections and databases

Unique laboratories and research technologies

Hundreds of active field-study sites across the state

Part of a world-class research university

Opportunities for efficiency and cost effectiveness through continued integration

Advisory board

Weaknesses

Reliance upon state funds given highly uncertain political/fiscal climate. State contracts generate less overhead/ICR.

Succession planning across the Institute

Maintaining and growing quality scientific staff in the face of demographic, budget, and retention issues

Maintaining adequate support staff (lab, shop, IT, administrative staff)

Poor perception/understanding among faculty

Titling/promotion path ill defined

Transitioning information systems, data and analysis, and collections to leverage new technologies Dispersed and aging facilities; collections facilities scattered and inadequate; some equipment and technology dated

Location well outside Chicago region

External Factors

Opportunities

Increased partnerships with University of Illinois faculty and students

New funding sources: Institute alumni, major donors, corporations, foundations

Expand political support across the state through expanded service and outreach

Coordinate and grow interdisciplinary work among the Surveys

Increased utilization of Institute data resources: collaboration with NCSA

Increased support of Chicago urban redevelopment and sustainable economic development efforts through coordinated, interdisciplinary work across the Surveys

Explore new museum/science center to help fund curation/storage of collections

Threats/Challenges

Recent rapid growth of grants and contracts may not be sustainable over time (e.g., stimulus-funded and large, one-time projects)

University establishment of UI Labs (Chicago) and Applied Research Institute (Champaign) may divert resources/attention/projects/clients

Prospect of decreased federal research funding in reaction to national budget issues