



## Five-Year Strategic Plan: 2020–2025

Adopted June 2020

## Table of Contents

1. <i>Executive Summary</i> .....	1
2. <i>Pardee Center Vision, Mission, and Values</i> .....	5
3. <i>Introduction</i> .....	6
3.1 Our Work.....	6
3.2 Our History .....	6
3.3 Why a Plan Now .....	7
3.4 The Planning Process .....	8
4. <i>Overview of the Plan</i> .....	10
4.1 Context and Intended Outcome .....	10
4.2 Summary of Strategic Directions .....	10
4.3 Structure of the Remainder of the Report .....	12
5. <i>Goals for the Mission-Driven Work of the Center</i> .....	13
5.1 Introduction.....	13
5.2 Research portfolio (Goal #1).....	13
5.3 Client-based Work (Goal #2).....	16
5.4 Academic/scientific work (Goal #3) .....	18
5.5 The International Futures system (Goal #4).....	21
5.6 Education (Goal #5) .....	24
6. <i>Goals for Supporting Structures and Processes</i> .....	27
6.1 Introduction.....	27
6.2 Human resources, governance, and financial resources (Goal #6)....	27
6.2.1 Personnel component .....	27
6.2.2 Governance component.....	29
6.2.3 Resource component .....	30

6.3 Project management, communications, and organizational culture (Goal #7).....	31
6.3.1 Project management component.....	31
6.3.2 Communications component. ....	33
6.3.3 Organizational culture component.....	34
7. <i>Moderate Growth</i> .....	36
8. <i>Next Steps</i> .....	39
9. <i>Appendices</i> .....	40
9A. Examples of Recent Sponsored Projects.....	40
9B. Contextual Information: Funding and FTEs.....	42

## 1. Executive Summary

The Frederick S. Pardee Center for International Futures at the University of Denver's Josef Korbel School for International Studies completed a collaborative planning process between March 2019 and March 2020 to set strategic directions for the Center for the five-year period from 2020–2025.

The planning process affirmed the centrality of core components of the Center's current focus and approach for the coming five-year period—namely (1) understanding and modeling the interacting human, social, and natural system components of global change; and (2) encouraging and supporting strategic policy analysis. It also affirmed the continuing centrality of the International Futures system of models for that work—supplemented as appropriate with other analytic tools—over the 5-year planning horizon.

At the same time, the planning process identified goals and initiatives to facilitate a more strategic shaping of the Center's research portfolio and, importantly, to expand and improve the Center's participation in, and contributions to, academic and scientific communities. Our vision is to play a lead role as a maturing organization whose work combines, and is informed and strengthened by, both scientific and applied policy-relevant work related to sustainable development.

Our home in the Korbel School provides the foundation for our work which, in turn, aligns with many of the core issue areas of the School (security, inclusive economic growth, democracy, sustainability, and human rights). Around these themes, we share a commitment to producing research with impact, engaging students in a broad range of learning opportunities, and interacting with policy communities and other constituents in the public arena. A number of the strategic goals and subgoals in our plan reflect the connections we already share with the broader Korbel community, while others, especially Goals # 3, 5, and 8 are directed at strengthening and expanding them. We look forward, for example, to developing a close

*Plan adopted June 2020*

connection with the School's recently established Scrivner Institute for Public Policy.

The special strength of the Pardee Center resides in its integrated approach to understanding both (a) the interacting inputs to human, social, and natural system change, and (b) the consequences of change in any one of those arenas across all three. Our tools and our orientation encompass more variables in interaction than any other integrated assessment modeling system and they allow us to address a broad range of future-oriented questions clustered within three principal interrelated research areas or domains.

The first area is the future of human development. Research in this area involves attention to improving the condition of individuals in society, including their access to food, income, and education, as well as their ability to maintain good health. We understand that human development is also fundamentally important to the societies in which people live and to environmental sustainability.

The second area focuses on patterns of societal development and domestic and international cooperation and conflict. We study issues in a variety of dimensions, with special emphasis on labor, inequality, conflict and state fragility, including simulating the effects of conflict on development, and building data and tools to better analyze patterns of influence, power, and interdependence in the international system.

A third area focuses on the interaction between physical systems (infrastructure, agriculture, water, energy, and climate change) and human and social development.

In addition to these research foci on changes in human and sociopolitical systems, including their interactions with natural systems—and cutting across all of them—is our ongoing focus on research methodology. We

continually work to improve the scientific foundation of our tools, including not only the International Futures system but also through gathering data, building datasets, and the use of innovative data analysis and presentation tools. Building from these efforts, we try to continuously improve the quality of policy-related analyses and projections that characterize our work. And finally, we try to be ever-mindful of broad epistemological questions related to the utility of models and modeling enterprises in our quest to contribute to building knowledge for future wellbeing.

Beyond its focus on the substantive components of the Pardee Center's work, the planning process involved an assessment of the Center's governance, structure, and culture, with an emphasis on making changes appropriate to our growth in size and the increased diversity of interests and capabilities of our personnel.

The resulting plan has eight goals that together form a comprehensive and coherent plan for the Center to be a model DU research center conducting cutting-edge social science research that is collaborative, inclusive, and financially sustainable. We are appreciative of our home in the University of Denver's Josef Korbel School of International Studies and look forward to pursuing these strategic directions in cooperation with the Korbel School and our colleagues throughout the University.

The goals are:

Goal 1: To shape a research portfolio that allows the Pardee Center to best build knowledge for future wellbeing

Goal 2: To selectively expand our client-based work in a direction that enhances the Center's ability to support policy making

Goal 3: To expand and improve the Center's participation in and contributions to academic and scientific communities

Goal 4: To strengthen the International Futures system, linked to appropriate data and other Pardee tools, and to enhance its long-term viability

Goal 5: To enhance and increase students' learning experiences and professional development

Goal 6: To enhance the Center's organizational capacity and functioning vis-à-vis its human resources, its governance structure, and its financial resource base

Goal 7: To enhance the Center's organizational capacity and functioning vis-à-vis center-wide project management strategies and processes, a robust communications plan, and a respectful and supportive work environment and culture

Goal 8: To seek moderate growth congruent with research goals and opportunities within an environment of shared Center governance and decision-making and broader Korbel School and University support

---

This strategic plan was formally adopted in June 2020 following endorsement by Korbel School and University leadership. A companion implementation plan built on broad staff participation in action steps will guide the achievement of the goals over the coming 5 years.

## 2. Pardee Center Vision, Mission, and Values

***Vision:*** Increased knowledge for future wellbeing

***Mission:*** We build and use data and tools to analyze our complex world and the long-term dynamics of change in human, social, and natural systems. We share our resources with policymakers, academics, and others seeking to improve the ways we contemplate and plan for the global future.

***Values:***

Interconnectedness: Bringing together ideas and people to build knowledge

- We analyze the world as a deeply connected system by bringing together insights from multiple academic fields
- We interact with policymakers, academics, and students to build and support communities of users of our data and models and to broaden our own perspective

Understanding: Mapping and measuring how the systems of the world interact

- We strive to better understand, represent, and communicate how human, social, and natural systems dynamically interact
- We work to make our complex models transparent and intelligible

Integrity: Committing to openness, honesty, and trustworthiness

- From our modeling assumptions and tools to the way we work with others, we strive to be as open and accessible as possible
- We deliberately communicate the limitations of our work as well as its strengths

## **3. Introduction**

### **3.1 Our Work**

The work of the Frederick S. Pardee Center for International Futures focuses on modeling the future within and across human, social, and natural systems. We create and use data and analytic tools to better understand these systems, their relationships, and the patterns of continuity and change in them over time for geographic entities and clusters in the global system.

Our flagship tool is the International Futures (IFs) modeling system which represents interacting models across multiple domains: agriculture, demographics, economics, education, energy, environment, gender, governance, health, infrastructure, international politics, and technology.

Our work with IFs and other tools builds and shares knowledge about historical patterns of development within and across these domains in order to analyze how they might unfold over long (10-50 year) future time horizons. While our analyses identify “likely” patterns of future development, we respect the deep uncertainty associated with projections of the future and our analyses typically include scenarios that frame and explore such uncertainty. Our research provides a platform for a structured dialogue with and within policy and scientific communities on the interactions that drive development outcomes and where policy priorities, synergies, and tradeoffs might lie.

Examples drawn from our recent projects appear in *Appendix 9A* and suggest the breadth of topics the Center has the capability to address.

### **3.2 Our History**

Barry Hughes began developing the IFs modeling system over 45 years ago as a faculty member at Case Western Reserve University. Since 1980 he has continued its development at the University of Denver’s Josef Korbel School

of International Studies. A meeting with Frederick Pardee at RAND Santa Monica in the early 2000s led to a relationship that enabled significant extension and enhancement of the IFs system and, in 2007, its institutionalization in a home of its own, namely the Frederick S. Pardee Center for International Futures at the Josef Korbel School.

At the time the Center was formed in 2007, it was staffed by 4 individuals, three of whom are still at the Pardee Center.<sup>1</sup> Over its first 5 years, the Center's work, generously funded by Mr. Pardee, focused on model development and the production of a 5-volume series titled *Patterns of Potential Human Progress*.

By the end of the 2019 fiscal year, the Center had grown to approximately 15 core FTEs, including three Korbel School faculty members with central roles in the Center.<sup>2</sup> Beyond the support from the Korbel School toward the faculty positions, the Center's direct expenditures in FY 2019 included approximately \$2.1 million funded from sponsored research and \$460,000 from endowment earnings. (*Appendix 9B* includes additional data about the growth of the Center and its current status.)

### **3.3 Why a Plan Now**

A number of factors make this an important time to evaluate Center strengths, opportunities, and challenges and to set strategic directions for the Center's future. They include:

---

<sup>1</sup> The three individuals who are still at the Pardee Center are Barry Hughes (the founding Director), Mohammad Irfan (then a Korbel School PhD candidate), and José Solórzano (then a recent DU computer science Master's degree graduate). The fourth person was Julius Gatune, a postdoc whose PhD was from the RAND Pardee Graduate School.

<sup>2</sup> The Korbel School faculty with core responsibilities in the Pardee Center are Jonathan Moyer (Center Director), Brian O'Neill (Director of Research), and Barry Hughes (Senior Scientist and Mentor).

- Sustained and rapid growth from a small “start-up” to a mid-size research center
- The need for a plan for continued maintenance and enhancements to the IFs system
- Opportunities for future growth and the need to respond thoughtfully to those opportunities
- A change in leadership in the Korbel School
- The implementation of the university-wide DU IMPACT 25 strategic plan that covers the period to 2025.

### **3.4 The Planning Process**

The Pardee Center initiated a strategic planning process in March of 2019 to address questions of the Center’s identity and research agenda, processes for organizational effectiveness, and assurance of a robust future for the International Futures simulation tool.

The planning process has been jointly led by Janet Dickson and Jonathan Moyer. Early input from all staff was provided via group meetings, individual interviews, and online surveys, and resulted in the updated and enhanced statement of the Center’s vision, mission, and values that appears on page 5 of this report.

These interactions with staff also identified five areas or “domains” as focal points for planning efforts and of individuals to lead those plans. The five initial areas and the individuals were Client-Focused Research (David Bohl); Project Management, Communication, and Culture (Whitney Doran); IFs and Other Tools (Barry Hughes); Academic Research (Brian O’Neill); and Human Resources, Governance, and Finance (Mickey Rafa). Education was subsequently added as an additional domain with both a curriculum

component (led by Keith Gehring with support from Jonathan Moyer) and a student component (led jointly by Whitney Doran and Mickey Rafa).

While each individual named above had primary responsibility within a single domain, they met as a group 11 times between August of 2019 and end of January 2020 in order to create plans with consistent and reinforcing components that together constitute an overall plan for the Center.

## **4. Overview of the Plan**

### **4.1 Context and Intended Outcome**

We aspire to be a model DU research center conducting cutting-edge research in a collaborative, inclusive and financially sustainable context. To that end, the intended outcome of the planning process is to assure a robust and sustainable portfolio of projects (a) aligned with Center vision, mission, and values, that (b) draws on our particular set of strengths and expertise, while (c) making positive and notable contributions to the work of clients and policy-makers, that also (d) contributes to scientific understanding of the interacting components of global change (e) within an inclusive and constructive work environment that supports professional development of all Center personnel.

The report that follows represents the completion of Phase 1 of the planning process—namely, the setting of strategic directions and goals for the Center’s mission-driven work and for structures and processes to support that work. Phase 2, already begun, is the translation of those goals into implemented action steps through which the goals will be achieved and by which annual progress will be tracked. This report focuses on Phase 1; Phase 2 will be the focus of a report anticipated by May 1<sup>st</sup> of this year.

### **4.2 Summary of Strategic Directions**

Eight strategic goals emerged from the planning process, one from each of the subject area domains and two (Goal #1 and Goal #8) from considering the individual plans in interaction. Subgoals were identified within each strategic goal to serve as the foundation for action steps in Phase 2 of the planning process.

The eight overarching goals and their subgoals (in parentheses) for the 2020-2025 period are:

Goal 1: To shape a research portfolio that allows the Pardee Center to best build knowledge for future wellbeing (project selection; active project development; personnel capacity; secondary project outcomes)

Goal 2: To selectively expand our client-based work in a direction that enhances the Center's ability to support policy making (scaleable IFs user base; public presence; innovation; scientific foundation)

Goal 3: To expand and improve the Pardee Center's participation in and contributions to academic and scientific communities (publications; personnel; funding; links and collaboration; internal activities)

Goal 4: To strengthen the International Futures system, linked to appropriate data and other Pardee tools, and to enhance its long-term viability (the model; personnel; processes; awareness, perception, and use)

Goal 5: To enhance and increase students' learning experiences and professional development (coursework; research opportunities; internships; alumni network)

Goal 6: To enhance the Center's organizational capacity and functioning vis-à-vis its human resources, its governance structure, and its financial resource base. (*Personnel:* recruitment; onboarding; professional development; career advancement. *Governance:* leadership team; assistant directorships; organizational structure. *Financial resources:* resource planning; pursuit of funding; resource stocks)

Goal 7: To enhance the Center's organizational capacity and functioning vis-à-vis center-wide project management strategies and processes, a robust communications plan, and a respectful and

supportive work environment and culture (*Project management*: research projects; Center governance and operations; student work. *Communications*: internal communications; client communications; Korbel School and the University of Denver; external communications. *Organizational culture*: inclusivity; shared values; collaborative work environment; culture of gratitude)

Goal 8: To seek moderate growth congruent with research goals and opportunities within an environment of shared Center governance and decision-making and broader Korbel School and University support (positions; space; DU and Korbel School role articulation; Korbel School research)

### **4.3 Structure of the Remainder of the Report**

Section 4 includes the goals that are most closely connected to the mission-driven work of the Center (research portfolio, client-based research, academic research, IFs, and education), while Section 5 includes the goals most closely connected to the internal structures and processes that support the mission-driven work (personnel, governance, and financial resources; project management, communications, and organizational culture). Section 6 presents a Pardee Center growth goal and Section 7 discusses next steps.

## **5. Goals for the Mission-Driven Work of the Center**

### **5.1 Introduction**

The planning process affirmed the centrality of core components of the Center’s current focus and approach for the coming five-year period—namely (1) understanding and modeling the interacting components of global change; and (2) encouraging and supporting strategic policy analysis. It has also affirmed the continuing centrality of the International Futures system of models for that work—supplemented as appropriate with other analytic tools—over that period.

At the same time, the planning process identified goals and initiatives to facilitate a more strategic shaping of its research portfolio and, importantly, to expand and improve the Center’s participation in, and contributions to, academic and scientific communities. We see the work with clients and an expanded presence in academic arenas as related at their core, with both drawing on representations of empirically-based drivers of change and their outcomes in human, social, and natural systems. Our vision is to play a lead role as an organization whose work combines, and is informed and strengthened by, both scientific and applied policy-relevant work related to sustainable development.

### **5.2 Research portfolio (Goal #1)**

To shape a research portfolio that allows the Pardee Center to best build knowledge for sustainable development and future wellbeing

*Discussion.* The nature of our tools, our view of how global change occurs, and the varying expertise and interests of Center personnel position us to actively seek projects across a wide range of topics. These factors, in combination with (a) recent Center successes in areas where we have comparative advantage, and (b) current and emerging trends in

development and futures-oriented research, led to the identification of a set of research questions as exemplars to guide active client-based and scientific project development. These research questions appear below, organized by major focal area:

- Human development
  - What are the long-term patterns of human development across countries and regions and how do changes in the dynamics across human, social, and natural systems impact sustainable human development?
  - How can progress toward the Sustainable Development Goals and successor goals be anticipated and accelerated, including analysis of trade-offs and synergies that most impact human wellbeing?
  - What is the future of income and wealth inequality around the world and how does it interact with the ability of societies to adapt to a changing climate or the vulnerability of societies to social instability?
- Societal development and domestic and international cooperation and conflict
  - What are the implications for patterns of cooperation and conflict if the world continues to move away from economic, institutional, and normative interdependence? How does the rise of China and India interact with an increasingly retreating West?
  - What are the future prospects for government capacity and state fragility? How can we better anticipate episodes of state fragility and model the impact of conflict on development?
- Natural systems in interaction with human and social development

- To what extent will climate change risks hinder progress on human development and what development and/or climate policies would best reduce such risks?
- Research methodology
  - What methods and approaches are best suited for long-term integrated model developments that can project dynamic patterns of continuity and change with increased accuracy?
  - What is the best way to characterize uncertainty in future societal and environmental outcomes and account for it in integrated analyses?
  - Why are some variables and systems more “knowable” and amenable to accurate projections than others over long future time-horizons?

Four subgoals identify processes in support of the desired research portfolio presented above:

- Project selection. *Center staff have a shared understanding of selection criteria regarding institutional, analytic, and resource fit of potential partners and projects.*
- Active project development. *We actively seek out projects and partners that align strongly with Center strengths and are responsive to emerging opportunities.*
- Personnel capacity. *The Center maintains a group of core staff, research aides, and extended support networks of faculty and contractors that can (1) efficiently and comfortably handle a base level of project needs, and (2) adapt to short-term changes in demand.*
- Secondary project outcomes. *Each project includes secondary objectives that benefit the Center in as many of the following ways as possible: (1) model enhancement, (2) analytical innovation, (3) internal*

*capacity building, (4) academic publication, (5) public exposure, (6) extending collaborative networks.*

*Discussion.* At any given time, the Pardee Center's portfolio of projects reflects some that were actively sought and some that came to the Center as unsolicited opportunities. While this will be true in the future as well, we will place a greater emphasis on active project development and also on a more formal process for evaluating the unsolicited opportunities that come our way while still attempting to retain flexibility.

Potential projects generated by Center priorities and/or by funding opportunities will be evaluated with specific reference to: (a) the question to be explored (the focus of the work is congruent with our vision, mission, and values; (b) the client or sponsor (there is compatibility between our mission and values and those of the client or sponsor); (c) analytic fit of the research (the project is a good fit for the tools we use and the expertise of our staff and affiliated personnel); (d) capacity (we have adequate financial and personnel resources to carry out the work in the timeframe allowed/negotiated); and (e) overall benefits to the Center (model enhancement, analytical innovation, internal capacity-building, academic publication, public exposure, extending collaborative networks). In addition, processes will be developed and implemented to provide more structured avenues for participation of Center staff as appropriate in evaluating potential projects.

### **5.3 Client-based Work (Goal #2)**

To selectively expand client-based work in directions that enhance the Center's ability to support policymaking within the framework provided by the Center's vision, mission, and values

The subgoals:

- A scaleable IFs user base. *The Pardee Center develops the on-demand tools and capacity to provide quality instruction on the use of the IFs system to a large audience without overburdening Center resources.*
- Public presence. *The Center's presence at high-levels within the policy-making community is expanded in terms of the number of domains the Center supports and the recognition of the Center as a provider of quality insight. As a public good, the work of the Center has increased exposure in media.*
- Innovation. *The Center will continue to push the boundaries of long-term policy research through the expansion of the IFs model into additional relevant issue spaces and by continually incorporating new methods and tools for analysis and the communication of our work.*
- Scientific foundation. *The analysis used in client-sponsored work of the Center will be increasingly supported by Center-led, peer-reviewed publications related to both results-based and methodological articles.*

*Discussion.* Innovative client-based research has been and will remain a core activity of the Pardee Center. We use data, academic research, and analytic tools to support development practitioners, analysts, and policymakers as they contemplate and plan for the future. Our work with them focuses on understanding what drives global change, strategic policy analysis, and policy trade-offs. In all that we do we strive to maintain rigor and integrity in our work within the context of ever-changing (and often urgently focused) client-oriented requests.

The Pardee Center began actively developing a significant portfolio of client-based projects in FY 2011. Working with a wide range of clients, our sponsored project volume first approached \$1.0 million in FY 2015 and then grew rapidly to just over \$2.1 million in FY 2019.

Over the past five years we have developed ongoing funded relationships with analysts and policymakers across a range of influential organizations, including the African Union Development Agency (AUDA-NEPAD), the United Nations (especially the United Nations Development Program), and the U.S. government (e.g., U.S. Agency for International Development, Department of Defense, and others). We seek a continued presence with these organizations for many years to come, and also the development of similar long-term relationships with other potential sponsors, including foundations with an interest in the issues we explore.

We also seek expanded reach and impact in two other arenas: (1) building a broader user-base for the IFs tool; and (2) gaining greater public awareness and appeal for our work and results. Both the significant learning curve required for practitioners and analysts to use IFs in depth and the difficulty in conveying complex model results for a general public require us to think of new ways of approaching both of these tasks.

#### **5.4 Academic/scientific work (Goal #3)**

To expand and improve the Pardee Center's participation in and contributions to the academic and scientific communities.

The subgoals:

- Publications. *The number and quality of peer-reviewed publications and their visibility to academic and scientific research communities are increased.*
- Personnel. *More diverse position types with clear connections to academic work are added to the Center's staffing pattern (e.g., research faculty, post docs, and/or PhD students doing dissertation work).*

- *Funding. Funding that supports academic work is increased through: (1) inclusion of academic components and outputs in client-based projects when possible; (2) pursuit of specialized funding sources that enable longer-term academically-oriented work; and (3) targeted commitment of a portion of internal resources such as endowment earnings and flowback from sponsored projects.*
- *Links and collaboration within DU. Engagement of and collaboration with Korbel faculty and other DU faculty is expanded on work related to Center goals and expertise.*
- *External links and collaboration. The Pardee Center's visibility to external colleagues (e.g., the Integrated Assessment Modeling community) and its engagement and collaboration with them are increased.*
- *Internal activities. Academically-oriented activities within the Center are strengthened and regularized, and there are clear expectations for participation of all Center staff (e.g., brown bag seminars) and/or student Research Aides as appropriate (e.g., training in systematic literature review techniques).*

*Discussion.* Because IFs is based on scientific studies of relationships between variables in and across human, social, and natural systems, the work of the Pardee Center has always had an academic foundation. However, in terms of funded projects (with the exception of the just-completed 5-year \$1.7 million Minerva grant to study state fragility) our work has emphasized the implications of such relationships for policy analysts and policymakers rather than for academic and scientific communities.

While the current plan does not envision a shift away from policy-oriented research and applications, it does signal a deliberate and focused pursuit of (1) academically-oriented projects; (2) explicit connections between our client-based work and academic outcomes; and (3) participation in a variety

of peer-reviewed venues. We will be significantly assisted in these efforts through the Director of Research position added to the Pardee Center in fall of 2018. The position is occupied by Brian O’Neill, an integrated assessment modeler with close ties to the international scientific research community who joined the Korbel School faculty as a tenured full professor at that time.

The heightened focus on academic projects extends to the IFs tool. While IFs development and enhancements to it have been grounded in scientific processes, much of its development is not documented in scientific publications. Components of this plan are dedicated to increasing staffing and funding so that such documentation can become a regular part of model development and interaction with the broader scientific and academic modeling communities.

The desire to increase our participation in academic and scientific communities is based on our belief that academically focused work and more applied research in support of policy making can improve each other. It is also motivated by our being part of the Korbel School and the University of Denver (with the resources, opportunities, and at least implied responsibilities that entails), and the common core provided by IFs and the other tools we use whether we are engaged in applied policy research or in scientific exploration.

Many projects will be appropriately focused more (and some exclusively) toward one type of work or the other and individual researchers will have varying interests in client-based vs. academic work. We will support that diversity of preferences through both professional research and academic research tracks. We want to remain a home for both generalists and specialists who sometimes work separately on projects, sometimes work together as teams, and sometimes shift roles in response to research needs and opportunities. We will celebrate both types of work and we see them

and the people who carry them out as equal partners in our mission-driven work.

### **5.5 The International Futures system (Goal #4)**

To strengthen the IFs system, linked to appropriate data and other tools of the Pardee Center, and to enhance its long-term viability

The subgoals:

- The model. *There is a systematic plan for evolving model improvements and development that is responsive in a balanced fashion both to the needs of funded projects and to internally specified priorities, with special attention both to linkages among models in the system and the ability to exogenously drive them.*
- Personnel. *The modeling team is increased in size and includes both personnel with sophisticated technical capabilities and individuals whose work focuses on theoretical and conceptual components and relationships.*
- Processes. *The modeling team is integrated productively with the broader Pardee Center team, as well as selectively with the Korbel School, the broader DU community, and others with interest and capacity.*
- Awareness, perception, and use. *Documentation and publications that convey the strengths of the model structure and of auxiliary datasets and tools are regular activities associated with the modeling team and other Center personnel as appropriate.*

*Discussion.* In one sense IFs is “simply” an enabling tool that supports the mission-driven work of the Center. More accurately however, IFs is an ever-evolving product of research into the variables that drive development and the outcomes of varying developmental paths—in other words, its

maintenance, further development, and dissemination are core aspects of the Center's mission to increase knowledge for future well-being.

At least four major thrusts are expected to drive IFs development over the next five years. They are:

- Completion of a software migration from Visual Basic 6 (VB6) to Visual Studio.NET. While begun and largely completed in 2019, full completion of the migration and issues it raises (e.g., changes in supporting software and installation creation and the movement of model developers to the new software) will continue through most of 2020.
- Movement of IFs code from being officially (*de jure*) open source to being so in practice (*de facto*). Constraining factors have been (1) the necessity in the past that developers use non-supported VB6; (2) the expense of third-party objects used by IFs; (3) the absence of updated instructional support for code use; and (4) the absence of Pardee Center policies and procedures for support for users and requirements of users for provision of code changes.
- Addressing known model system weaknesses. The current model development work plan identifies many small issues, but also some larger ones. For instance, work has never been completed on representation of the formal labor market and its connection to labor informality and to the representations of education and inequality. Similarly, work on the impacts of climate change and water system constraints on other models has been highly preliminary.
- Developing the ability to specify key variables exogenously. Much work with integrated assessment model systems (IAMs) benefits from the ability to exogenously drive component models, thereby controlling projections and focusing on exploring their forward impacts (as in the projection of carbon emissions and climate change

using specified economic and demographic projections). Further, the use of separate, often soft-linked models within IAM suites, while greatly complicating integrated analysis, both facilitates exogenous control and allows swapping in of alternative issue-area models. The IFs system could benefit from (a) elaboration of the set of key variables that can already be exogenously overridden (such as population and GDP); and/or (b) complete separation of component models with capability to substitute others from inside or outside of the Pardee Center (model modularization). The former can be accomplished selectively in the next 5 years; the latter would be a major effort of comparable and probably greater magnitude than model migration. A decision as to whether to undertake the latter in the coming five years requires considerable further discussion as we move into the period.

Not only is there an ambitious agenda with respect to directions for model developments; there is also significant work that needs to be done to determine and implement the processes through which future model development will take place—that is, the size and constellation of the modeling team, the relationship between conceptual and technical modeling processes across Center personnel, and the role of the modeling team in project selection and scoping. These issues take on special importance given the expected retirement of Barry Hughes some time during the coming 5-year period. These discussions have begun but will need to be a focus of continued planning.

Curriculum materials, model documentation, and publications advance not only the awareness, perception, and use of the IF system but also contribute to other strategic goals, such as work with clients, increasing the Pardee Center's presence in academic and scientific communities, and contributing to the education of DU students.

## 5.6 Education (Goal #5)

To enhance and increase students' learning experiences and professional development through coursework, research opportunities, internships, and post-graduate experiences

The subgoals:

- Curriculum. *Faculty affiliated with the Pardee Center provide expanded offerings to DU graduate and undergraduate students as well as on-line courses for external audiences.*
- Research opportunities. *The Center seeks continued funding from sponsors to support student Research Aides in a supportive environment that facilitates academic learning, professional development, and personal growth.*
- Internships. *The Center has a formalized process for matching highly qualified students with internship opportunities that develop through the Center's work with clients and partners.*
- Alumni network. *Research Aides who have graduated become part of a formalized Pardee Center alumni network that fosters continued connections with each other and with the Center and its work.*

*Discussion.* From the beginning of the development of the International Futures software, its founder viewed it first and foremost as an educational tool. That, combined with the Pardee Center's home in the Korbel School, reinforce student learning and development as one component of the Center's mission-driven work.

Presently two courses in the Korbel School's curriculum are offered annually that focus on global modeling via the IFs system. Jonathan Moyer teaches the graduate level *International Futures* course and Keith Gehring teaches the separate *International Futures* course for undergraduate students. Brian

O'Neill teaches two courses (although not based on IFs) that deal with long-term process-based quantitative modeling of human-natural systems (*Climate, Science, and Society*; and *Quantitative Analysis of Global Environmental Change*), and Dale Rothman (a Pardee Center faculty affiliate) teaches *Systems Thinking for Social Sciences* which covers basic systems principles that translate into key issues pertinent to developing and understanding simulation models.

We are proposing two curricular initiatives with respect to Pardee/Korbel offerings. One is to split the current graduate level course into two offerings: one would be a hands-on quantitative course ("Building and Using Quantitative Models") and the other would focus on future trends for users of modeling data and forecasts ("Grand Challenges"). The second proposed initiative is the development of an on-line curriculum leading to a "micro-certificate" for an external audience of professionals; we envision 4-5 courses on topics such as global trends, scenarios of global change, model building, and use of IFs. The on-line curriculum would also be adapted for use in training with clients and sponsors and in conjunction with classroom-based instruction for Korbel School students.

In addition to its contributions to Korbel School courses, the Pardee Center provides significant research opportunities for student Research Aides. In the past, large-scale funded data projects enabled us to hire large numbers of students (over 100 over the course of the 2019 fiscal year). While numbers in the 60-70 range are more likely in future years, we continue our commitment to provide substantive research opportunities for a large cadre of students.

Research Aides are grouped in resource teams based on their interests in combination with Center needs (data gathering; literature review; data analysis and visualization; communications). Through an organized mentoring and project management system, Research Aides develop

research skills, function as members of a team and as leaders, and have the opportunity to interact with Pardee Center faculty and professional researchers and with Pardee Center clients. They enrich our work, expand the scope of what we are able to accomplish, and represent a link to the broader University of Denver community, and we, in turn, play a significant role in launching them on their career paths.

Also with respect to career paths, from time to time opportunities for student internships, either prior to or after graduation, have become available through the Center's relationships with project sponsors and partners. Over 20 students have interned with a variety of organizations, including the Army Strategic Studies Group; Creative Associates (Washington, DC); the Institute for Security Studies (Pretoria, South Africa); the International Center for Tropical Agriculture (Cali, Columbia); UNDP Brazil; UNDP New York Headquarters; USAID Uganda; and the Western Cape Government (Cape Town, South Africa). While we expect the number of such internships will remain modest, we will develop a more formalized procedure for matching highly qualified Research Aides with future internship opportunities.

Post-graduation, many Korbel School alums who worked with the Pardee Center as students have stayed in touch as they come back to Denver to visit, as they seek jobs, and as their careers develop. A more formal alumni network would be beneficial to them and to the Center (and the Korbel School more broadly), and we plan to form, implement, and maintain such a network.

## 6. Goals for Supporting Structures and Processes

### 6.1 Introduction

Many of the internal structures and processes of the Center have not kept pace with the increased size and breadth of its projects and personnel but instead remain essentially those that characterized the Center in its early, far smaller, and more homogenous form. Examples include a flat organizational structure with functions and supervisory responsibilities that remain highly centralized at the director level. Thus, a very significant part of the current planning effort, beginning with input from the individual interviews with all Center staff, has focused on identifying structures and ways of operating that are appropriate to the organization currently and as it continues to mature over the coming five-year period. One set of initiatives relates to human resources, financial resources, and the Center's governance structure. A second and related set focuses on project management, communications, and the culture of the Center.

### 6.2 Human resources, governance, and financial resources (Goal #6)

To enhance the Center's organizational capacity and functioning vis-à-vis its personnel, its governance structure, and its financial resource base

#### 6.2.1 Personnel component

The overall purpose of the personnel component is to enable the Center to attract and retain a team of highly qualified research and support personnel.

There are four subgoals for this component:

- Recruitment. *Qualified applicants for Pardee Center positions are sought through a variety of means that reflect our commitment to diversity and inclusion as well as the nature of the background and level of expertise required for the work.*

- Onboarding. *All new employees are integrated into the Pardee Center in an effective and coherent manner through a suite of onboarding materials and activities for new employees and their supervisors.*
- Professional development. *Staff pursue a variety of professional development activities throughout the year through an annual budget earmarked for professional development.*
- Career advancement at the Center. *Through formalized career advancement paths with clear experience and job requirements, all staff are aware of and encouraged to pursue opportunities for advancement within the Pardee Center.*

*Discussion.* For the first decade of the Center's existence, its research staff were predominantly recent Korbel School graduates who had worked with the Center during their tenure as MA students. About two years ago we began a greater focus on external recruitment in an effort to diversify our research team in terms of academic preparation, professional experience, research interests, skill sets, gender, and ethnicity. We sought and followed advice from DU's Office of Human Resources & Inclusive Community by posting job announcements across a variety of channels to encourage diverse applicants. There were some bumps in the road both for our new external hires and for Center leadership. For example, we had not recognized the very steep learning curve that "outside" recruits would experience in developing competence using the IFs software (our prior experience had been with Korbel School grads who had learned how to use IFs when they were students).

We remain committed to casting a wide net in our recruitment efforts by posting positions both internally and externally, including on job boards that are targeted for diverse audiences. We are now also committed to, and have begun to develop, formal processes to encourage the success and retention of qualified staff. One is an onboarding program that includes working with experienced team members to develop competence with IFs as well as a

more general orientation to the Center and its work, the Korbel School, and DU. Another is an emphasis on professional development and defined tracks for career advancement at the Center. In summary, we want to hire the best candidates and then do our part to make their careers with us productive and rewarding.

### 6.2.2 Governance component

The overall purpose of the governance component is to establish an organizational structure and processes appropriate to a mid-sized research center with a broad project portfolio and an increasingly diverse staff in terms of academic backgrounds, research interests, and expertise. There are three subgoals for this component:

- Leadership team. *A leadership team is formed by the director and meets regularly to discuss matters of urgency and strategic priority with a mutually understood role for input into decision-making.*
- Assistant directorships. *The Center has a robust organization of assistant directors with distinct delegated authorities and responsibilities.*
- Organizational structure. *Reporting lines are clear and rational, with supervisory responsibility dispersed across the organization.*

*Discussion.* The initiatives in this domain focus on creating a work environment with more shared leadership, responsibility, and decision-making. In combination, they are intended not just to relieve the bottlenecks that are all but inevitable in a highly centralized organization as it becomes larger and more complex, but also to recognize and further develop the talent that resides in Center staff. It will also allow the director to focus on providing overall vision and leadership within the organization and on further developing external awareness about the Center and opportunities to engage in desired research projects.

Because of their centrality to the Center's effectiveness moving forward, steps to implement the governance initiatives are already underway. Job descriptions have been developed for three new Assistant Director positions (one for analytics, one for model development, and one for operations) and the Center is working with Dean Mayer's office and the university's Human Resources department for approval and implementation. Further, the strategic planning domain group has functioned as an ad hoc leadership team during this planning period, thus serving as an "incubator" or model for the leadership team (with membership to be determined) that will be formed to provide ongoing support to the director.

### 6.2.3 Resource component

The overall purpose of the resource component is to assure the long-term financial health of the Center. There are three subgoals for this component:

- Resource planning. *Resource planning (financial and human) is thoughtful and rigorous, and this information is used actively in the selection, assignment, and management of projects.*
- Pursuit of funding opportunities for sponsored projects. *The Center has processes in place to identify and pursue funding opportunities in a strategic manner for both client-based work and academic research.*
- Resource stocks. *The Center leverages its existing fungible resources to align with its medium to long-term needs and also has a strategy for growing its resource stocks over time.*

*Discussion.* The bulk of the Center's resource stocks are made possible by the very generous gifts that Fred Pardee has provided to the Center, including \$8.7 million in endowment. The formula that the University uses for distribution of endowment earnings currently results in about \$400,000 added annually to an account that is available for our discretionary expenditures and another portion directed back into the endowment to increase the corpus (and hence its future expendable earnings). The Center

enjoys a strong continuing relationship with Mr. Pardee, and he has indicated that we will receive a future gift from his bequest.

Other fungible stocks are generated by flowback to the Center (a return of a portion of indirect cost recovery from the Center's sponsored projects<sup>3</sup>) and some degree of expenditure flexibility in fixed price contracts. In addition, we have been able to create a reserve fund of approximately \$760,000 from unspent gift operating accounts. Our goal with respect to these resource stocks over the coming five years is twofold: (1) to pursue avenues to increase them; and (2) to use them in targeted ways (including as a buffer against funding downturns or other contingencies) that help the Center achieve its strategic goals.

### **6.3 Project management, communications, and organizational culture (Goal #7)**

To enhance the Center's organizational capacity and functioning vis-à-vis project management strategies and processes, a robust communications plan, and a respectful and supportive culture

#### 6.3.1 Project management component

The overall purpose of the project management component is to effectively organize how Center personnel work together to complete projects on time and with desired outcomes.

There are three subgoals for this component:

- Research projects. *Project management strategies and processes are developed and applied to all research projects to ensure quality*

---

<sup>3</sup> The Korb School policy for distribution of flowback funds is one-third to the unit generating the funds, one-third to support the development of research across the School, and one-third as a Dean's discretionary pool. The Pardee Center generated just over \$260,000 in flowback funds in FY 2019.

*research outputs and successful relationships with clients and sponsors.*

- Center governance and operations. *Project management strategies and processes are developed and applied to internal Center governance and administrative functions to support collaboration across the organization and streamline operations.*
- Student work. *The existing project management structure that supports work led by Research Aides is developed further, with emphases on training opportunities, professional development, and leadership.*

*Discussion.* Focused on effective deployment of personnel and other resources, project management will facilitate and guide the activities that are necessary for successful implementation of our plan. We will follow an “agile project management” approach that adapts a template of formal processes and steps to the needs of individual projects depending on such things as personnel capacity and the complexity or simplicity of the project.

Formal project management processes are already being used with the Center’s Diplometrics project and with student Research Aide teams. Going forward, they will be used with all Pardee Center research projects and also with more complex aspects of Center governance and operations (for instance, in the implementation of this strategic plan).

For research projects, this will extend to a more formal process even in the pre-contract phase. Input will be sought from the Director of Research and the Assistant Directors of the functional areas (analytics, model development, research operations, and Center operations) for collective awareness, buy-in across those who will be central to project success, and enhanced shaping of projects prior to finalized contracts. An example of such shaping will be exploring opportunities to include an academic component

in client-sponsored work and/or laying the foundation on the front end for generating a publication or participating in other peer-reviewed venues related to the project.

### 6.3.2 Communications component.

The purpose of the communications component is to contribute to an internal Pardee Center sense of community and to external awareness of, and connections with, the work of the Center.

There are four subgoals, each focusing on a different audience or target, coordinated through an annual strategic communications plan:

- Internal communications. *Internal communications are clear, regular, and predictable in scope, and include contextual content (as well as “information”) to build a shared awareness about Center activities, opportunities, choices, and issues.*
- Client communications. *Client engagement and other communications with clients are improved and extend beyond their current scope to encompass follow-up processes after project completion.*
- Korbel School and the University of Denver. *The Center has and implements a communications plan focused on engaging the Korbel School and the broader University of Denver communities in the work and activities of the Center.*
- External communications. *The Center effectively uses communications best practices to share information about the Center and our work with audiences external to the University of Denver, including through our website and other online media.*

*Discussion.* During the period of the Center’s rapid growth, internal communications were more ad hoc and “siloeed” than is our intent moving forward. Subject to issues of confidentiality and reasonable discretion (as well as avoiding overload), we want all staff to receive full information and

the same information. For example, through regular staff meetings all staff should be aware of ongoing and potential Center work, decision-making issues and roles, and the Center's financial status and outlook.

In terms of other audiences, we particularly want to use communication to increase our connections with the Korbel School and the broader University of Denver communities, both in terms of awareness and also, even more important, as active partners in a variety of activities and pursuits.

### 6.3.3 Organizational culture component.

The purpose of the culture component is to assure a work environment where employees feel welcome, supported, and able to meaningfully engage in the Center's mission. The culture component has four subgoals:

- *Inclusivity. Center staff, and those with whom they interact, are sought and celebrated for their individual and differing strengths, perspectives, and approaches.*
- *Shared values. Center leadership, in partnership with all staff, develop, effectively communicate, and embrace shared values expressed through respectful and supportive collegial relationships.*
- *Collaborative work environment. The way work is organized as well as deliberate and engaging opportunities for socializing encourage staff to collaborate on projects and to develop appreciation for the contributions of staff with whom they may not work closely.*
- *Culture of gratitude. Staff are recognized for their contributions and any performance issues are addressed through constructive feedback.*

*Discussion.* The individual interviews with all staff early in the planning process included this open-ended question: "What three things would you not want to see changed at the Pardee Center?" Almost universally the first thing people said revolved around regard for their co-workers, the absence of a competitive environment among staff, and appreciation for the

helpfulness and thoughtfulness they experienced from their colleagues. Almost as frequently they said they appreciated the opportunity to engage in meaningful work aligned with their values. It is on this very strong foundation that we are endeavoring to further build the Center's "culture of gratitude."

We know that our rapid growth over recent years without corresponding changes in organizational structures and processes, and without adequate onboarding for new staff hired through external recruitment, was challenging for staff, new and old alike. Our "start-up" culture did not provide clarity about professional development or research expectations; it also resulted in a system that was sometimes characterized by bottlenecks alternating with periods of intense activity.

All of the goals and subgoals in this plan that relate to personnel, governance, project management, and communications have direct connections to the working environment and cultural milieu of the Center. Coupled with inclusive practices and a genuine attitude of respect, our goal is to further build a foundation that reinforces patterns of inclusion, appreciation, and collegiality in all that we do.

## 7. Moderate Growth

### 7.1 Pardee Center Growth (Goal #8)

To seek moderate growth congruent with research goals and opportunities within an environment of shared Center governance and broader Korbel School and DU support

The subgoals are:

- Positions. *The Center is able to use, as appropriate, new position types (e.g., postdoctoral fellows and research faculty) to contribute to the breadth and depth of its research.*
- Space. *The Center has adequate offices and other work and meeting spaces to support a productive work environment.*
- DU and Korbel School role articulation. *Roles and responsibilities central to the relationship between the Pardee Center, the Dean's suite, and DU central administration are clarified, including connections to important functions and services in the broader DU community.*
- Korbel School research. *The Pardee Center and other research units and projects at the Korbel School are integrated through cross-cutting structures and processes and a culture of support and inclusion.*

*Discussion.* By moderate growth we mean an increase from the projected approximately \$2.0 million in funded projects in FY 2020 to around \$3.3 million in FY 2024 and in core FTEs from 15 to 20–22.

Throughout the strategic planning process, we rejected the idea of deliberate near-term large-scale growth and, in fact, began the process without a growth goal of any size. The drivers and benefits of moderate growth, however, became clear as the process proceeded. They include:

- An increased focus on academic research will require new types of positions, such as postdoctoral fellows and research faculty. While the numbers of personnel in such positions will be small in the near-term (and perhaps longer), they need to be incremental so that our policy-related work with clients is not diminished. Our strategy is to build-out scientific work while maintaining work with clients rather than substituting one for the other.
- In order to continue to develop and enhance the IFs system, we anticipate the addition of one or more new positions to the modeling team.
- We already receive unsolicited or “serendipitous” requests to engage in funded work. If our efforts are successful with respect to Goals 1, 2, 3, and 4, we expect a greater number of such opportunities will come our way for significant work that is central to our mission and interests and congruent with our strengths. We want to be able to selectively pursue some of these opportunities.
- Because our work is broadly interdisciplinary in nature, we need researchers whose backgrounds and expertise range across many disciplines and fields. Some areas of expertise can be well satisfied through teams that include Korbelt faculty and other faculty affiliates or policy specialists. Even so, we are very much on the small side for an organization of our type.

There is a reason that growth of the Center appears as Goal 8 rather than as an earlier goal. For growth of any amount to be internally viable we need to be well on the way to implementing Goals 1 through 7. More distributed governance structures and processes (part of Goal 6) and Center-wide project management (part of Goal 7) are of special importance, and both are already being implemented.

For best outcomes we also need a carefully crafted closer relationship with the Korbel School's administration, faculty, research units, and projects. Best outcomes also require broader DU support (for example, appropriate additional space as needed) and recognition of how the Pardee Center "fits" in the University (for example, how it can contribute to multiple strategic initiatives in the DU IMPACT 2025 plan, especially those dealing with international impacts, research and scholarship, social policy research, preparing students for careers and lives of purpose, and knowledge bridges).

## **8. Status and Next Steps**

The work leading to this report focused on setting strategic directions for the Pardee Center for International Futures for the 2020-2025 period. This phase was completed with the adoption of the eight strategic goals following endorsement by Korb School and University leadership.

We are now moving to implementation of action steps that will allow us to achieve the goals. A comprehensive implementation plan has been developed to guide these efforts. The implementation plan has identified specific action steps and is assuring the coordination of activities across domains, determining appropriate sequencing and timing, and identifying individuals and assembling teams with responsibility for the various components. The implementation process will include an annual evaluation of progress toward our goals and any needed adjustments in either goals or action steps will occur as part of that process.

## 9. Appendices

### 9A. Examples of Recent Sponsored Projects

#### 9A.1 African Union Development Agency (AUDA; formerly NEPAD)

Collaboration in support of Agenda 2063, AUDA's long-term growth and development plan for countries within the African Union. The research reports have covered a range of topics, including long-term continental transformations, food security in Africa, and (currently) analysis of the conditions for success of the Continental African Free Trade Agreement. Our work has included technical training for AUDA personnel, the creation of methods-based analyses related to the Agenda 2063 targets, and the clustering of African countries based on their development contexts and outcomes.

#### 9A.2 Minerva Research Initiative, Department of Defense (DoD)

Minerva projects fund university-based social science research on areas of strategic importance to U.S. national security policy, in this case the drivers of political instability. Our work focused on the identification of structural imbalances that make countries prone to political instability (for example, a high level of human development but poor governance). The analyses were informed in part by security data-building and analytic work carried out as part of the Center's long-term Diplometrics project.

#### 9A.3 United Nations Development Programme (UNDP)

Analysis in support of long-term development planning with a variety of United Nations Development Programme (UNDP) offices and technical groups, including training in the use of the International Futures modeling system. Our work with UNDP began with invited research contributions to their 2011 and 2013 *Human Development Reports*. More recently it is focusing on analyses and forecasts of progress toward the Sustainable

Development Goals at national and subnational levels, including two flagship reports on the impact of the war in Yemen since the war's escalation in 2015.

#### 9A.4 United Nations Environment Programme (UNEP)

Contributions to the 4<sup>th</sup> and 6<sup>th</sup> editions of UNEP's *Global Environment Outlook (GEO)* series, whose purpose is to understand the current state of, and trends with respect to, the environment, including policies to meet environmental and sustainable development objectives. Two Pardee Center researchers contributed to Chapter 9 in *GEO4* ("The Future Today"), and various Center personnel were either lead or contributing authors to Chapters 21, 22, and 24 in *GEO6* (Part C: Outlooks and Pathways to a Healthy Planet with Healthy People).

#### 9A.5 U.S. Agency for International Development (USAID)

Development trends analyses with and for a variety of USAID country and regional missions to inform development programming. Analyses since 2015, including at subnational levels, have used both the IFs system and other development analytics to inform USAID's 5-year Development Cooperation Strategies at both regional and country levels. As an example, our trends analysis directly influenced USAID's 5-year strategy for budgeting, planning, and resource allocation for Uganda and an ongoing analysis of key development indicators at the subnational level.

#### 9A.6 Western Cape Provincial Government

Collaboration with the Western Cape Provincial Government of South Africa since 2011 in support of strategic policy analysis and long-term development planning related to the agency's OneCape 2040 visioning document. A key component of this work has been adapting and extending the country-level IFs system to produce subnational analyses and forecasts. We have produced provincial level policy analyses and conducted a series of IFs trainings and

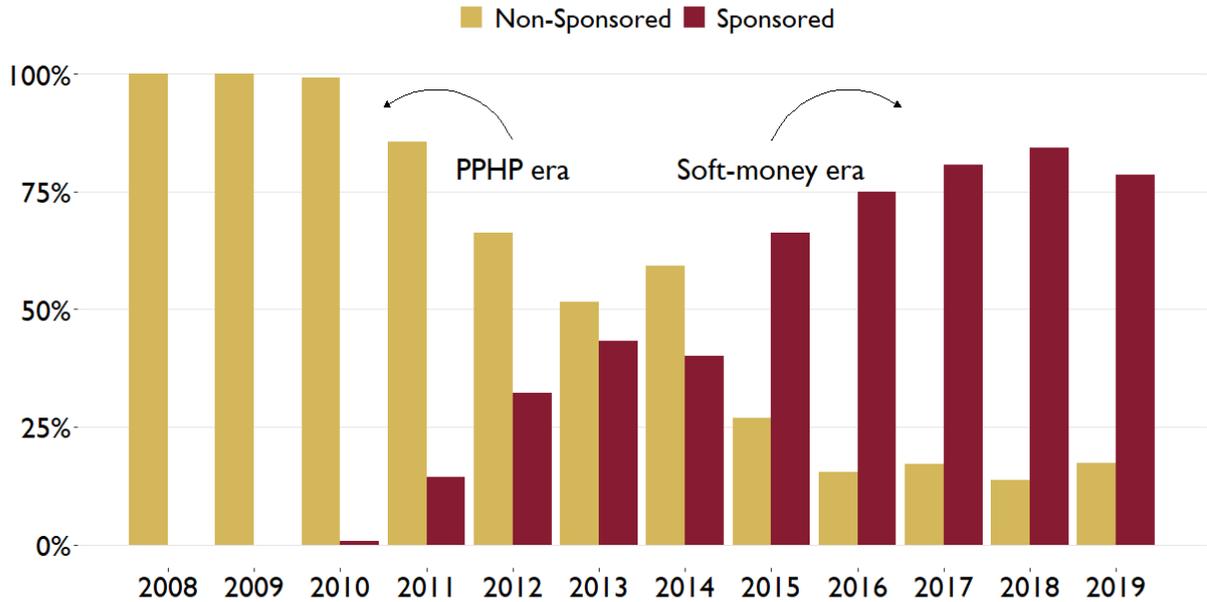
foresight workshops for provincial government officials. An IFs-focused team, which includes former Pardee Center research assistants, now exists within the Western Cape Provincial Government.

### **9B. Contextual Information: Funding and FTEs**

This section highlights historical trends in funding and staffing at the Pardee Center to provide context to the five-year Strategic Plan. Figure 1 shows the shares of sponsored and non-sponsored funding across time and identifies a transition from gift funding to sponsored project funding. Prior to 2010, there was no sponsored research funding and the Center was entirely reliant on gift funding from Frederick S. Pardee to support the development of the Patterns of Potential Human Progress volume series. In 2011 and 2012, Center leadership embarked on a new effort to fund Pardee research through sponsored projects. Moving through the 2010's, Pardee funding increasingly was sourced from sponsored work, with over 75% of funding coming from sponsored projects from 2016-2019.

## Non-sponsored vs. Sponsored Funding

Percent of total annual spending by fiscal year



Scenarios Forum 2019 considered sponsored funding  
Sponsored funding includes small revenue not administered by ORSP

Figure 1: Non-sponsored vs. Sponsored funding share.

Figure 2 shows the absolute volume of research funding across time broken down by source. The overall volume of sponsored funding has increased significantly, driving increases in the Center’s budget, which exceeded \$1 million in FY 2015, \$2 million in 2017, and nearly \$2.7 million by 2019. The projected FY 2020 budget is about \$2.3 million.

## Sponsored vs. Non-sponsored Funding: Total Funding

Total annual spending by fiscal year

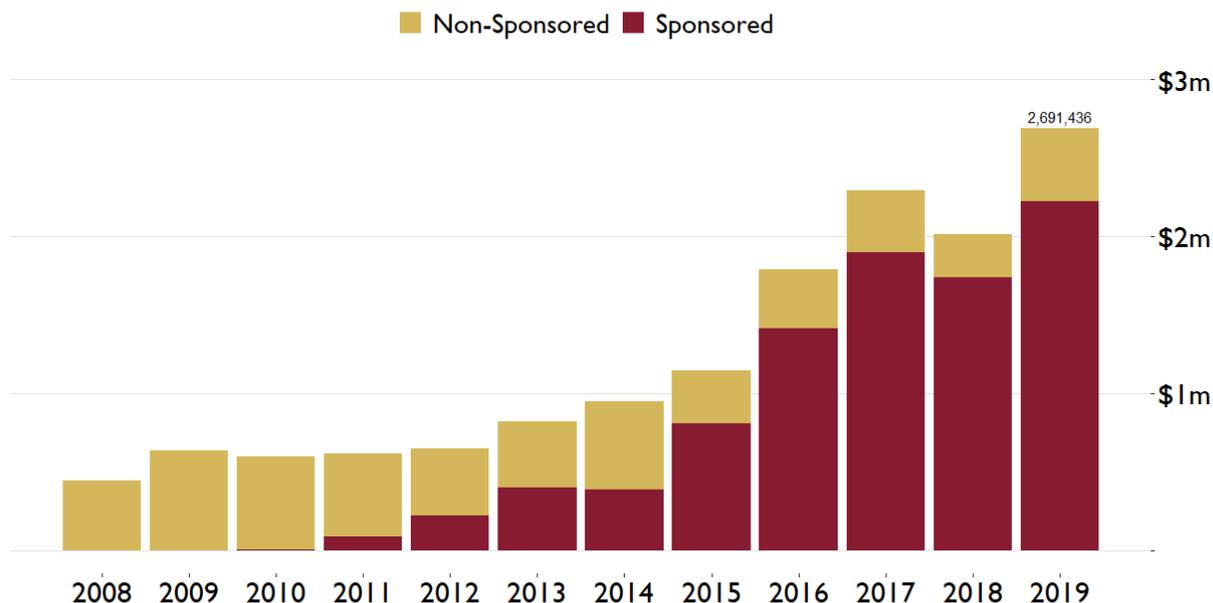


Figure 2: Sponsored vs Non-sponsored funding total.

Figure 3 turns attention from the annual flow of spending on personnel and research to the financial stocks that the Pardee Center maintains. From the period 2004-2012, overall financial stocks grew significantly through savings from gifts supporting the PPHP series, at one point exceeding \$1.3 million. As the Center moved from a gift-funding model to a sponsored research model, the source of center stocks shifted. Over the past six years the center has grown and diversified its fungible resource stocks. We maintain residual funding from the earlier gift period at \$765,000 and we have grown our stock of flowback, endowment earnings distribution, and closeout funding to \$1.5 million in 2019. We project that we will end FY 2020 with fungible stocks of \$1.6 million.

The Center also has non-fungible resource stocks in the form of an \$8.7 million endowment from Mr. Pardee.

# Resource stocks by fiscal year

Based on year-end values

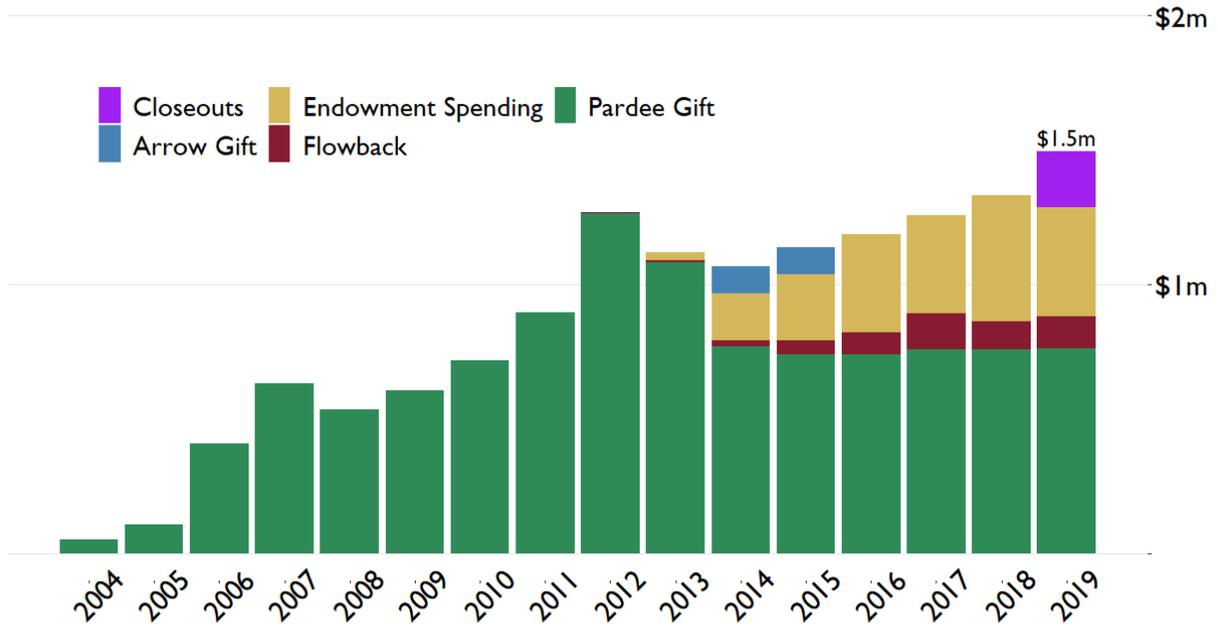


Figure 3: Resource stocks by fiscal year.

Table 1 shows the number of sponsored projects across time which, with some ebb and flow, have remained between 13-19 projects on an annual basis. The duration of the projects also has varied, from a few months to more than 8 years.

Table 1. Sponsored research projects over time (2020 is projection through fiscal year-end)

	Fiscal Year				
	2016	2017	2018	2019	2020
Sponsored Research Projects	14	13	14	17	19

Table 2 shows the number of full-time personnel based on FTEs across time. The Center has more than doubled the number of full-time employees between 2014 and 2018.

*Table 2. Full-time personnel over time (2020 is projection through fiscal year-end)*

	Fiscal Year						
	2014	2015	2016	2017	2018	2019	2020
FTEs	6.3	7.7	10.1	11.5	12.1	14.7	13.3

Since FY 2017, the Pardee Center has employed a large number of students (the majority are Korbel graduate students, though we have an increasingly large INTS undergraduate population as well as students from across campus). From 2016-2020, we have employed 474 students (counting on an annual basis, so some students who work for two years would be double-counted) with an average employment of 97.8 students over the course of each year.

In addition, the center has collaborated with a number of Korbel faculty. The majority of collaborations are captured when faculty outside of the Center receive a course release or overload payment for their contribution on a project. Since 2016 we have collaborated with an average of 3.4 Korbel faculty per year.

*Table 3. Korbel student and faculty collaborations (2020 is projection through fiscal year-end)*

Category	Fiscal Year				
	2016	2017	2018	2019	2020
Students	88	115	100	101	85
Korbel Faculty Collaborations	5	4	3	3	2

