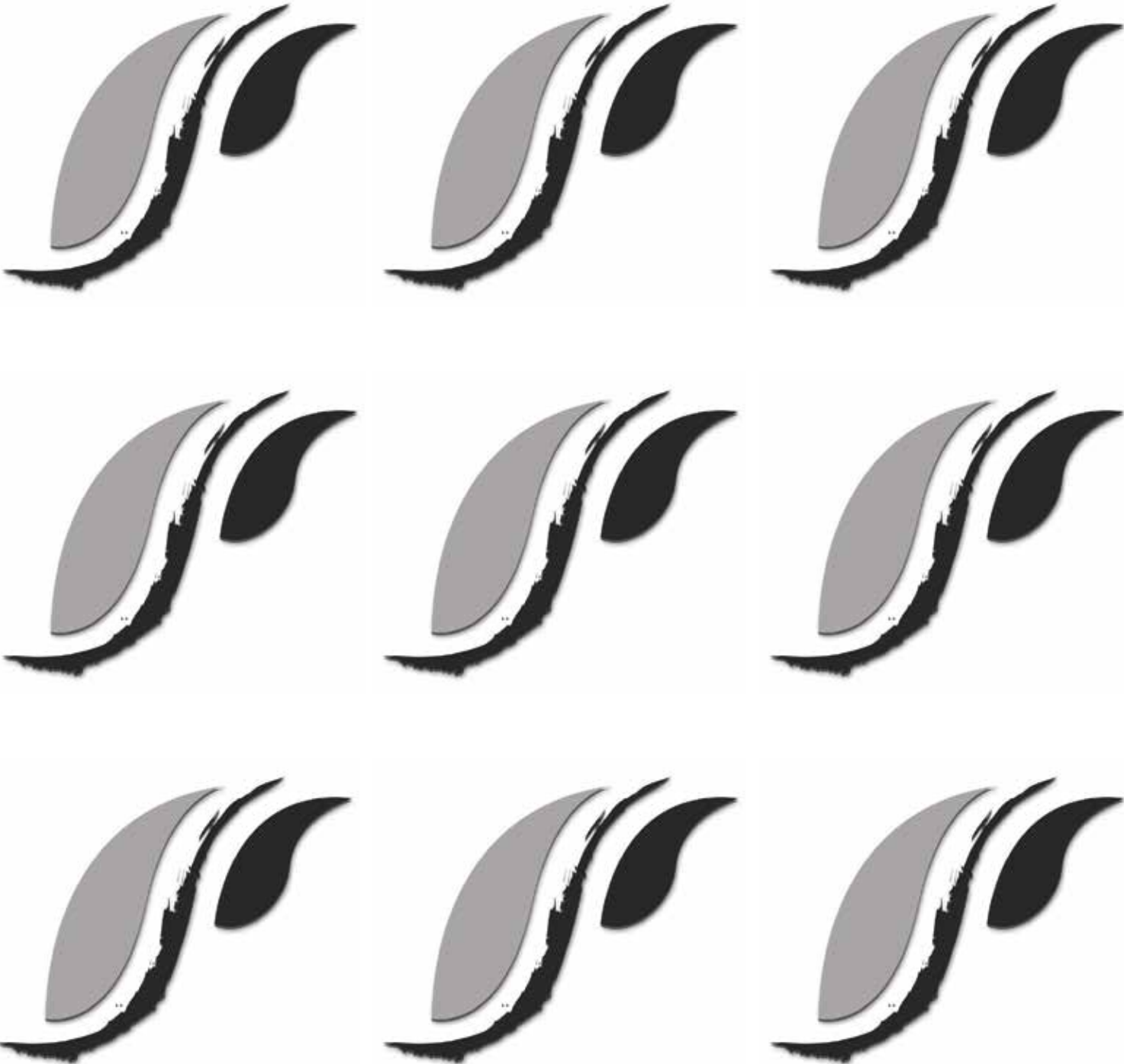


FREDERICK S. PARDEE CENTER FOR INTERNATIONAL FUTURES

JOSEF KORBEL SCHOOL OF INTERNATIONAL STUDIES | UNIVERSITY OF DENVER



ANNUAL REVIEW 2018-2019

A Letter From the Director

Dear Friends,

The goal of the Pardee Center is to build knowledge and understanding about our present and future. Whether we are building academic knowledge, informing public policy, exploring avenues for human development, fostering research networks, or training the next generation of analysts, we believe that we can expand the scope of what we know about what lies ahead. We believe that our integrated, data-driven approach can help us better understand how choices today improve sustainable human development in the future.

In pursuit of this goal, we have published reports for decision-makers across a variety of issue areas. Our work on African transformations furthered continental discussions about development choices at the founding of the African Union Development Agency. We produced three reports for USAID exploring trends in educational attainment, social violence, labor, and migration, for an audience of aid workers and policymakers. Our work exploring the impacts of conflict in Yemen funded by the UN Development Programme was referenced on the floor of the United States' Senate and in the UN Security Council.

We also worked to pursue our Center's vision by building academic knowledge. Barry Hughes published *International Futures: Building and Using Global Models*, a book marking

40 years of his scholarship, innovation, and leadership in the field (see page 19). We also published peer-reviewed work analyzing climate change, alternative pathways to human development, drivers of political instability, and new ways to measure sub-national gross domestic product, among other issue areas (contributing to nine journal articles). The addition of Professor Brian O'Neill to the Josef Korbel faculty and Pardee team (as Director of Research) has broadened our academic network as well. In March, Brian brought the Scenarios Forum to campus, a large academic conference focused on the interaction of climate and societal future scenarios (read more on page 7).

Better understanding the present and future means knowing that change and uncertainty are inevitable. That's why, during the next academic year, we are pursuing a strategic planning process to help us better refine the kind of influence we want to have on the world, as well as the ways we can use that influence to help people think more broadly, more systematically, and further into the future. You are invited to join us on this journey!

Yours in curiosity,

Jonathan D. Moyer



17 SPONSORED PROJECTS
WITH 13 CLIENTS

OVER \$2.1 MILLION IN
SPONSORED RESEARCH

4 COURSES TAUGHT BY
PARDEE CENTER FACULTY

7 NEW FULL-TIME
MEMBERS OF OUR TEAM

100 STUDENTS
EMPLOYED FROM
5 DU COLLEGES

UNDP

This year, we entered into a Memorandum of Understanding (MoU) with the United Nations Development Programme (UNDP), signaling a commitment to our ongoing partnership, built on strengthening the IFs platform for Sustainable Development Goal (SDG)-related analysis. In 2017, we collaborated with UNDP to develop an interface for analysis of SDG-related targets and indicators, which resulted in more accessibility for analysts—representing governments, civil society, and donors—who use IFs to understand the current state of affairs related to the SDGs in a country or region. Furthermore, there is now greater ability in IFs to forecast and evaluate potential progress toward development targets. In 2017 and 2018, we partnered with UNDP to produce a series of country-level reports while supporting capacity building of policymakers, development practitioners, and civil society through IFs training workshops. The purpose of the MoU is to strengthen our long-term partnership and institutionalize the joint efforts of the UNDP and the Pardee Center in providing policy guidance to UN member countries.

Brazil

Throughout the past year, Assistant Director of Research Operations Mickey Rafa and Senior Research Associate David Bohl led a project for the UNDP which facilitated the identification, collection, and incorporation of data on the states of Brazil into the IFs model. This work was an extension of a report produced by the Pardee Center in December 2017, *Sustainable Development Goals Report: Brazil 2030*, which uses IFs to analyze development priorities for Brazil. In October, Rafa led introductory trainings in Brasilia for participants from multiple agencies, states, and levels of government. Subsequent trainings in February and July 2019 sought to build capacity for using IFs to think about the long-term future at the state level. Scenarios developed by the Pardee Center research team will inform 27 UNDP reports prepared for state governors across the country.

Yemen

The report *Assessing the Impact of War on Development in Yemen* was launched in April of 2019. This report explores the impact of the war in Yemen during the four years since the 2015 escalation and what human development might look like if the fighting continues. Using the IFs modeling platform, we created a counterfactual scenario in which conflict in Yemen ended in 2015 rather than escalating into today's war, as well as three scenarios in which war in Yemen ends in 2019, in 2022, and in 2030. We find that the war has already set back human development decades. And that the victims of the war are increasingly Yemen's youngest, with children under five bearing an increasing size of the burden the longer conflict continues. Director Jonathan D. Moyer travelled to Beirut, Lebanon, and Amman, Jordan, in the spring to present the report.

The report was named "Document of the Week" by Foreign Policy and cited by UNICEF Executive Director Henrietta Fore in her address to the UN Security Council in May. Senator Bernie Sanders highlighted the report as the Senate prepared to vote on the Yemen War Powers Resolution on May 2, both in a Twitter video and on the Senate floor. Jonathan D. Moyer was interviewed about the report findings by Colorado Public Radio's Ryan Warner on May 14.

Additional reports about the impact of conflict in Yemen on development are planned for later 2019.



Egypt

In October 2018, Director Jonathan D. Moyer and Senior Research Associate David K. Bohl conducted a workshop and training for government officials and members of UNDP and Ministry of Planning in Cairo, Egypt. "Long-Term Forecasting with International Futures (IFs)" was an introduction to integrated analysis and the IFs model within a development context.

Our collaboration produced *Sustainable Development Goals Report: Egypt 2030* in November 2018 for the UNDP and these strategic partners: Ministry of Planning, Monitoring and Administrative Reform (MoPMAR), Central Agency for Public Mobilization and Statistics (CAPMAS), and the National Institute of Planning (NIP). The report explores Egypt's current development trajectory to 2030 across areas of human and economic development. It presents five alternative scenarios designed to help explore the impacts of different policy approaches. Using the IFs modeling platform, these scenarios are evaluated in terms of their ability to accelerate Egypt's development progress and help the country achieve the targets set by the SDGs.

In April 2019, four Pardee Center researchers conducted a high-level workshop and training for government officials, members of UNDP, MoPMAR, and other strategic partners. "International Futures (IFs) Capacity Expansion and Scenario Building Workshop," led by Senior Research Associate David K. Bohl, Research Associate Sarah Dickerson, and Research Fellows Taylor Hanna and Brendan R. Mapes, included hands-on training in the IFs model, summary findings from *Sustainable Development Goals Report: Egypt 2030*, and interactive work with scenarios. The goal of the workshop was to build capacity to understand the value and function of long-term, integrated forecasting, while situating scenarios within the current political and economic context.

Mexico

In September 2018, Senior Research Associate David K. Bohl and Research Fellow Taylor Hanna conducted a three-day workshop and meetings with the UNDP at the Centro de Investigación y Docencia Económicas (CIDE) in Mexico City. Our collaboration produced the December 2018 report *Sustainable Development Goals Report: Mexico 2030*, which presents four alternative scenarios designed to help explore the impacts of different policy approaches in Mexico. The workshop was designed to educate our partners at UNDP about an integrated, long-term, scenarios approach to development and planning.



Western Cape Government

In 2019, the Pardee Center produced a policy research paper for the Western Cape Government (WCG) that will directly inform the province's 2020 to 2024 strategic plan. The paper includes trends and scenario analysis to explore the efficacy of key policy levers in maximizing economic and human development in the province to 2040. Pardee Research Associate Alanna Markle led the paper's development, working closely with representatives from the WCG Department of the Premier, Chief Directorate: Policy and Strategy. This work follows seven years of ongoing engagement with the WCG's policy and strategy team to produce policy-relevant research at the sub-national level, and represents an important milestone in successfully integrating futures analysis into the province's policymaking process. In addition, the Pardee Center produced several issue-area papers and briefs for WCG in 2018 to 2019 on topics such as aging, the burden of disease, and future opportunities in trade and tourism.

Pardee Center Report Looks Into Africa's Future

By Alyssa Hurst, DU Marketing and Communications

In 1950, 30 percent of the global population was European. By 2030, 30 percent of the global population will be African.

"That's a huge transformation. An extra billion or so people," says Jonathan Moyer, Director of the University of Denver's Frederick S. Pardee Center for International Futures. "It means huge changes in the global system, and people should be aware of them and the magnitude of these changes."

Massive shifts like these present formidable questions — ones which Moyer and his team of researchers at Pardee aim to help answer. In fact, this is the very mission of the center, created in 2007 to improve the human condition through long-term forecasting and global trend analysis. The trajectory of Africa's demographic shifts and other transformations are outlined in a recently released report prepared by the Pardee Center in collaboration with African Union Development Agency (AUDA-NEPAD), which serves as the development arm of the African Union. The report was launched by the AUDA-NEPAD in Addis Ababa in front of influential figures in African politics, including Vera Songwe, head of the United Nations Economic Commission for Africa.

The Pardee Center's supporting role with the AUDA-NEPAD dates back to 2012 and promises to extend well into the future. "We are in conversations to formalize the partnership in a more concrete way," Moyer says. "Our role is to sit back and wait for guidance and instructions from them, because they are setting the agenda and we are filling a gap in that technical space."

Moyer hopes that the report will help guide the AUDA-NEPAD in its decision making over the next 50 years. "We want to build capacity to do analysis using the tools we

have here to help continental, regional and national governments better plan for development and to make choices that prioritize human capability improvements within the context of environmental sustainability," Moyer says. "That's the goal."

Pardis Mahdavi, acting dean of the Josef Korbel School of International Studies, home to the Pardee Center, considers this pairing of research and application critical to the school's mission. "The Pardee Center's partnership with the African Union Development Agency is an excellent example of the Korbel School's broader mission to bring academics and policy makers to the same table, and to marry research to real-world applications and solutions," she says. "We're striving to break down the walls between academics and practitioners, and this partnership is a good model for how this works. For our students, it's a unique opportunity to see how what they learn in the classroom plays out across the globe."

While predicting the future seems tricky, Moyer is confident Africa will see transformations in four areas, all discussed in the report: demographics, human development, technology and natural systems. "Some things are more certain than others," he says. "The demographic future is pretty certain. The massive population growth is happening. ... Human development is happening —that's persistent. Education will improve. Life expectancies will improve. Renewable energy growth is a persistent trend. The fact that climate change is happening is a persistent trend."

All of that exists within a framework of uncertainty, of course. Governance and choice remain unpredictable as ever, presenting a true wild card that could vastly impact the country's trajectory. And, with a booming population comes challenges related to education, health care and infrastructure. What's more, just as technological advancements like cell phones and ATMs can improve lives, others, like automation and robotics, threaten to reduce the number of jobs, even while accelerating development.

"Being aware of the big transformations that we are highlighting is important, but then also understanding that building government capacity, improving transparency and effectiveness, improving inclusion — these are all important drivers of the future of the continent," Moyer says. "Political decision makers, civil society and citizens will make the decision about where to go, so we are meant to play a background role in this space."

Without a doubt, though, says Moyer, Africa is a power on the rise. "Africa is going to be a giant economic block and a giant demographic block," he explains. "There's a huge amount of uncertainty still, but Africa will be bigger, wealthier and more developed."

And, Moyer adds, it has a slight competitive edge when it comes to sustainable development: "There isn't another region that developed with a continental organization like the AUDA-NEPAD that's trying to help guide the development. This is completely unique."



African Union Development Agency

This year, we continued and expanded upon our work with the African Union Development Agency (AUDA-NEPAD), the implementing arm for the African Union (AU) development agenda. Since 2015, we have collaborated with NEPAD to support the organization's efforts to develop a long-term growth and development plan for countries within the AU. Our team has provided a series of hands-on trainings and produced research and analysis on food security, continental transformations, and Agenda 2063 targets.

In September 2018, Martin Bwalya, Head of NEPAD's Comprehensive Africa Agriculture Development Programme, visited the Pardee Center in Denver. He spent a week meeting with our researchers as well as University of Denver officials interested in issues surrounding development in Africa. Mr. Bwalya gave a presentation to Korbel school students, faculty, and staff entitled, "Thinking about Long-Term Development Priorities in Africa: A View from NEPAD and the African Union."

February 2019 saw the publication of a new report by the Pardee Center and NEPAD, *Africa's Path to 2063: Choice in the Face of Great Transformation*. Director Jonathan D. Moyer attended the 32nd African Union Summit and the 37th Session of the AUDA-NEPAD Heads of State and Government Orientation Committee Meeting in Addis Ababa, Ethiopia.

The report uses IFs to take a long-term, macro, and integrated approach to thinking about four transformations underway in Africa: demography, human development and inequality, technology, and the environment. The analysis seeks to inform policy, investment, and development choices for Africa's pursuit of Agenda 2063 and the SDGs. The report is a collaboration between Dr. Jonathan D. Moyer, David K. Bohl, and Taylor Hanna from the Pardee Center, and Dr. Ibrahim Mayaki and Martin Bwalya from AUDA-NEPAD.



"The Pardee Center's partnership with the African Union Development Agency is an excellent example of the Korbel School's broader mission to bring academics and policy makers to the same table, and to marry research to real-world applications and solutions"



Scenarios Forum

Over 300 researchers, policymakers, foundation representatives, and business leaders from 41 countries convened on campus for the Forum on Scenarios for Climate and Societal Futures in March, a meeting on scenarios for climate and societal futures hosted by the Pardee Center and the International Committee on New Integrated Climate change assessment Scenarios (ICONICS). Scenarios outlined by Representative Concentration Pathways (RCPs) and Shared Socioeconomic Pathways (SSPs) formed the foundation of the discussion, and this interdisciplinary meeting brought together communities using those scenarios and others as basis for research and policy-making related to the future of our planet.

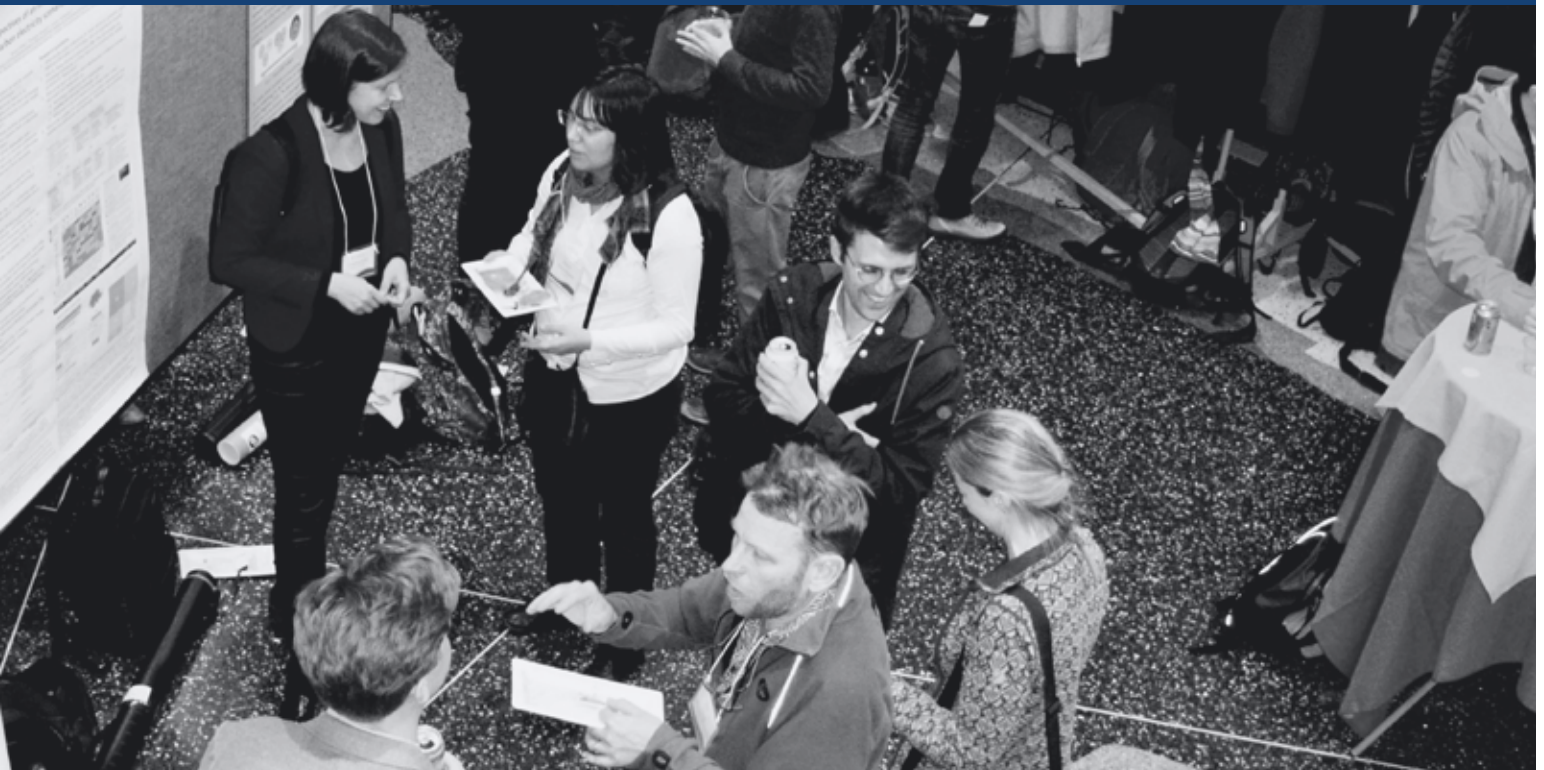
The goal of the meeting was threefold: to bring people together from different disciplines and communities using or developing scenarios; to take stock of how well the current scenarios are working; and to facilitate a link between the research and assessment communities that both use the scenarios, albeit to different ends, in their work. In addition to plenary sessions and dinners that brought all participants together, the Forum offered a series of discussions on topics ranging from governance to geoeconomics to the state of the oceans, all presenting research related to the scenarios.

Director of Research Brian O'Neill, who served as Chair

of the Forum's steering committee, commented that the meeting was particularly successful in uniting people from different disciplines who might never have otherwise connected, laying the groundwork for future collaboration. "There was a small existing community already, but this meeting really accelerated its growth and brought many new people together who don't often mix."

O'Neill was also encouraged by the cohesiveness of the meeting, despite the wide range of topics: "People found pretty much every presentation that they went to very interesting. But we also encouraged sessions to devote a lot of time to discussion, and to discuss not just the topic at hand but its relation to the themes of the meeting, which were the scenarios being used, whether they were working well, and what needed to be done to improve them."

The next step is synthesizing the feedback from the meeting and adjusting scenarios to better meet research needs. "We need to make the scenarios more suitable to looking at questions that go beyond climate change to other development challenges," O'Neill said. What is also clear is that this meeting will continue to happen at regular intervals, in various locations around the world, as more parties use the scenarios to answer big questions about the future impact of climate change.





Pardee Center Participation in the Scenarios Forum:

- David K. Bohl: Endogenous Migration in the Shared Socio-Economic Pathways
- Melissa Bukovsky, Linda O. Mearns, Jing Gao, and Brian O'Neill: The Sensitivity of Regional Climate Projections to SSP-Based Land Use Changes in the North American CORDEX Domain
- Alison Delgado, Gokul Iyer, Brian O'Neill, Ian Kraucunas, Leon Clarke, and Kalyn Dorheim: A Framework for Sub-National Multi-Sector Dynamics Scenarios
- Jing Gao and Brian O'Neill: Spatially-Explicit Global Urban Land Expansion Scenarios Consistent with the Shared Socioeconomic Pathways
- Barry B. Hughes: Pursuing the SDGs: Integrated Scenario Analysis
- Leiwen Jiang, Steve Dahlke, Hamidreza Zoraghein, and Brian O'Neill: Multi-Scale Population Projections for the U.S. Consistent with the SSPs
- Jonathan D. Moyer and Brendan R. Mapes: The Future Adaptive Capacity of Governments across Shared Socio-Economic Pathways
- Brian O'Neill: Role and Use of Scenarios in the Integration across Special Reports and WG Reports
- Erich Striessnig, Jing Gao, and Brian O'Neill: Spatial Projections of Age-Structured Population in the US



Pacific Northwest Laboratory (PNNL): IM3

The Integrated Multi-sector, Multi-scale Modeling (IM3) project is a multi-institutional effort funded by the Department of Energy's Office of Science as part of the MultiSector Dynamics Research Program. It is focused on studying dynamic interactions among climate, energy, water, land, socioeconomics, critical infrastructure, and other sectors in the U.S. The project is developing a set of models that can be linked together to analyze the vulnerability and resilience of these coupled systems in the face of various types of potential stresses. Research Director Brian O'Neill is coordinating the population dynamics element of the IM3 project, which also involves Research Scientist Hamid Zoraghein and external collaborators at the Colorado School of Mines and the Population Council. The population team is developing and applying a new model of U.S. population at the state and grid-cell level and producing alternative scenarios of population growth and spatial distribution as influenced by domestic and international migration. These scenarios will integrate the potential influence of climate change on domestic migration, and more broadly will be used in the IM3 project to drive scenarios investigating resilience to stresses on energy and water systems in the western U.S.

USAID

The August 2018 publication of *Achieving Food Security in Uganda* marked the completion of a research project by Steve Hedden, Mickey Rafa, and Jonathan D. Moyer studying various interventions for improving food security in Uganda, in terms of both consumption and production. The report was featured at the Uganda Joint Agricultural Sector Annual Review and will inform policy and decision-making going forward.

In August 2018, Jonathan D. Moyer, Alex Porter, Andrew Scott, and José Solórzano visited Guatemala and Honduras in support of the Pardee Center's ongoing work in partnership with USAID Latin America and the Caribbean Office of Regional Sustainable Development (LAC/RSD) and Mathematica Policy Research. These research efforts seek to understand and explore trends in education systems, societal violence, labor market dynamics, and migration in Central America and the Caribbean. The project yielded three reports led variously by Dr. Sarah Dickerson and Alex Porter. *Central America and the Caribbean: Regional Education Report* examines the value of greater investment in education in the region. *Assessing the Honduran Education System: A Macro Analysis of Current Trends and Possible Futures* and its counterpart, *The Future of the Guatemalan Education System: A Macro Analysis of Education Quality and Quantity's Impacts on Development*, examine educational attainment in each country and investigate alternative future scenarios that may impact education and broader development indicators.





Minerva Research Initiative

Since 2014, Pardee Center researchers, in collaboration with others at the Josef Korbel School of International Studies, have investigated the puzzle of state fragility and the complex task of predicting political instability. Our work analyzing structural drivers of political instability continued in 2018-19 sponsored by the Minerva Research Initiative, a DoD-sponsored and university-based social science research program, whose objectives are to foster and improve the Defense Department's social science intellectual capital in order to address future security challenges and to build bridges between the DoD and the academic social science community.

Understanding when and how countries are likely to experience disruptive episodes of state failure and political instability is important for planning humanitarian interventions, investment, or acting strategically regarding foreign policy. Episodes of state failure are extremely rare and can dislocate millions and kill hundreds of thousands of people. Recent failures to predict political instability events associated with the Arab Spring and other conflicts have pointed to significant limitations in quantitative methods used to predict conflict.

Korbel School faculty and student researchers have gathered data, built new datasets, and constructed qualitative case studies around the drivers of political instability. These data were organized and analyzed using two tools: the IFs modeling platform and DataGator (a data aggregation tool also developed at the Pardee Center). Researchers operationalized a range of structural imbalances quantitatively

across various issue areas (economy, education, gender, governance, health, etc.) to evaluate how these measures relate to the historical onset of instability. The research supported analysis that demonstrates how significantly traditional models of political instability vary in their accuracy across time.

In February 2019, *The British Journal of Political Science* Published a peer-reviewed piece by Pardee Center Research Associate Drew Bowsby and Korbel School faculty Erica Chenoweth, Cullen Hendrix, and Jonathan D. Moyer. "The Future is a Moving Target: Predicting Political Instability" evaluates previous research and concludes that the drivers of instability are not constant over time; care must be exercised in interpreting prediction exercises as evidence in favor or dispositive of theoretical mechanisms.

In September 2018, Dr. Oliver Kaplan presented some of these findings and introduced his working paper, "Exploring Country Narratives of State Fragility and Failure," at the Annual Meeting of the Minerva Initiative in Washington, DC. Also in September, Dr. Jonathan D. Moyer spoke about the work in "Predicting International Affairs" at the 2018 Annual Meeting and Exhibition of the American Political Science Association in Boston, MA. In September of 2018, Institute for Security Studies researcher Dr. Julia Bello-Schunemann and Dr. Jonathan D. Moyer published a policy brief titled "Structural Pressures and Political Instability: Trajectories for Sub-Saharan Africa" followed by a briefing later in 2019 at the German Foreign Ministry.

Presentations, Conferences, Meetings, and Events

AUGUST 2018

Workshop and IFs Training

United Nations Development Programme (UNDP) and
Ministry of Planning

Cairo, Egypt

Jonathan D. Moyer and David K. Bohl

Food Security Report Featured at Annual Meeting

The Joint Agricultural Sector Annual Review (JASAR)

Kampala, Uganda

Steve Hedden, Mickey Rafa, Jonathan D. Moyer: Pardee
Center's report for USAID-Uganda, *Achieving Food Security
in Uganda*

Workshops and Meetings with USAID Latin America

USAID Latin America, Caribbean Office of Regional
Sustainable Development (LAC/RSD), Mathematica Policy
Research

Guatemala City, Guatemala and Tegucigalpa, Honduras

Jonathan D. Moyer, Alex Porter, Andrew Scott, José
Solórzano

SEPTEMBER 2018

Predicting International Affairs

Annual Meeting and Exhibition of the American Political
Science Association

Boston, MA

Jonathan D. Moyer

NEPAD Meetings and Presentation

Frederick S. Pardee Center for International Futures

Denver, CO

Martin Bwalya, Head of the Comprehensive Africa Agriculture
Development Programme, NEPAD (New Partnership for
Africa's Development): *Thinking About Long-Term
Development Priorities in Africa: A View from NEPAD and
the African Union*

Workshop and IFs Training

United Nations Development Programme (UNDP)

Mexico City, Mexico

David K. Bohl and Taylor Hanna

GEO-6 Meeting

United Nations Environment Programme (UNEP)

Cancun, Mexico

OCTOBER 2018

Pardee Methods Lunch: Tableau

Josef Korbel School of International Studies

Denver, CO

Mickey Rafa

Global Change Assessment Model (GCAM) Community Modeling Meeting

The Joint Global Change Research Initiative

College Park, MD

Steve Hedden

Korbel Research Seminar

Josef Korbel School of International Studies

Denver, CO

Brian O'Neill: *How much climate change is too much? The
'Reasons for Concern' about climate change.*

International Futures (IFs) Subnational Data Workshop

United Nations Development Programme (UNDP)

Brasilia, Brazil

Mickey Rafa and David Bohl

Club of Rome 50th Anniversary Summit

Rome, Italy

Barry Hughes

NOVEMBER 2018

Methods Lunch: Zotero

Josef Korbel School of International Studies

Denver, CO

Jonathan D. Moyer

Sustainability and Development Conference

University of Michigan

Ann Arbor, MI

Sarah Dickerson: *Maternal Psychological Well-being and
Offspring's Outcomes in Peru: A Quantitative Analysis*

Presentation of Demographic Forecasts

Western Cape Government Department of Human
Settlements

Pretoria, South Africa

Alanna Markle: *Planning for the Journey: Forecasting
migration-led population change with a case study on
education spending*

Annual Meeting of the Integrated Assessment Modeling Consortium

Seville, Spain

Barry B. Hughes, Brian O'Neill, Leiwen Jiang: *Adding
Spatial Age Structure to the SSPs: A case study for the
continental U.S.*

Earth & Environmental System Modeling PI Meeting

Bethesda, MD

Brian O'Neill: Sub-national scenarios

Brown Bag Lecture

Frederick S. Pardee Center for International Futures
Denver, CO

Dr. Christopher Rice, Acting Director of the U.S. Army
Future Studies Group: *Integrated Assessment and Planning
for Long-Term Security*

DECEMBER 2018

Workshop and Panel

Global Technology Summit
Bengaluru, India

David K. Bohl: *Technology and Society: Creating a Safer
World*

American Geophysical Union Fall Meeting

Washington, D.C.

Brian O'Neill: *The Use of Shared Socio-Economic Pathways
(SSPs) in Integrated Human-Environment Research*

Brian O'Neill: *Population, Sustainable Development, and
Climate Change Policy; The use of Shared Socio-Economic
Pathways (SSPs) in integrated human-environment research*
Hamidreza Zoraghein: *U.S. State Level Futuristic Population
Downscaling at 1 KM Resolution under SSPs for Integrated
Assessment Modeling*

JANUARY 2019

Lead Author Meeting of the Sixth Assessment Report

The Intergovernmental Panel on Climate Change (IPCC)
Durban, South Africa

Brian O'Neill: *Convening Lead Author, Key risks across
sectors and regions*

Lead Author Meeting of the Sixth Assessment Report

The Intergovernmental Panel on Climate Change (IPCC)
Vancouver, B.C., Canada

Brian O'Neill: *Convening Lead Author, Key risks across
sectors and regions*

Korbel Research Seminar

Josef Korbel School of International Studies
Denver, CO

Barry B Hughes: *International Futures: Building and Using
Global Models*

Southern Political Science Association Annual Meeting

Austin, TX

Austin S. Matthews and Yann Kerevel: *The Electoral
Competitiveness of Working Class Candidates in Germany*

FEBRUARY 2019

IFs Training and Showcase of Subnational Data

United Nations Development Programme (UNDP)

Brasilia, Brazil

Jonathan D. Moyer, David K. Bohl, Henrique Estides Delgado

Report Launch at 32nd African Union Summit

Heads of State and Government Orientation Committee
Meeting

New Partnership for Africa's Development (NEPAD)

Addis Ababa, Ethiopia

Jonathan D. Moyer: *Africa's Path to 2063: Choice in the
Face of Great Transformation*

Posner Center Symposium 2019

Posner Center for International Development
Denver, CO

Mickey Rafa and Sarah Dickerson: *Development Analytics
and Foresight with International Futures*

MARCH 2019

Scenarios Forum 2019

University of Denver

Denver, CO

Brian O'Neill: *Conference Chair*

Brown Bag Lecture

Frederick S. Pardee Center for International Futures
Denver, CO

Dr. James Ward, visiting scholar from University of South
Australia: *Planetary Boundaries: Living within Limits*

CMIP6 Model Analysis Workshop

European Commission Horizon 2020 project PRIMAVERA;
European Climate Prediction System

Barcelona, Spain

Brian O'Neill: *WCRP Working Group on Coupled Model-
ling (WGCM) CMIP Panel*

Inter-Departmental Scenario Workshop

Western Cape Government

Capetown, South Africa

Alanna Markle and Dale van der Lingen



Presentations, Conferences, Meetings, and Events

APRIL 2019

Arab Forum for Sustainable Development

United Nations Development Programme (UNDP)
Beirut, Lebanon

Jonathan D. Moyer: *Inclusion, Empowerment and Equality as Pathways to Peace and Development*

Report Launch

United Nations Development Programme (UNDP)
Amman, Jordan

Jonathan D. Moyer: *Assessing the Impact of War on Development in Yemen*

IFs Trainings for Army Fellows

U.S. Army Future Studies Group
Arlington, VA

Jonathan D. Moyer and Collin Meisel: *The Discernible Future: Using the International Futures Tool to Examine Transformations in Physical, Demographic, and Social Systems and Their Effects on National Security*

Migration Consultation

International Organization for Migration and Statistics
South Africa
Pretoria, South Africa

Alanna Markle: *The Centrality of Migration to Population Trends in the Western Cape and Estimated Impacts on Service Delivery Budgets to 2030*

IFs Capacity Expansion and Scenario Building Workshop

United Nations Development Programme (UNDP) and Ministry of Planning, Monitoring and Administrative Reform (MoPMAR)
Cairo, Egypt

David K. Bohl, Sarah Dickerson, Taylor Hanna, Brendan R. Mapes

Annual Meeting of the Population Association of America

Austin, TX

Hamid Zoraghein and Leiwen Jiang: *Subnational Urbanizations Projections for China, India and the United States*

MAY 2019

Report Cited on U.S. Senate Floor

War Powers Resolution Vote
Washington, D.C.

Senator Bernie Sanders: *Assessing the Impact of War on Development in Yemen*

Report Cited in Address to United Nations Security Council

UN Headquarters
New York, NY

UNICEF Executive Director Henrietta Ford: *Assessing the Impact of War on Development in Yemen*

Interview: Colorado Matters

Colorado Public Radio
Denver, CO

Jonathan D. Moyer interviewed by Ryan Warner: *The State of Yemen's Civil War*

Strategic Planning Kick-Off Meeting

Frederick S. Pardee Center for International Futures
Denver, CO
Pardee Center Staff and Faculty

JULY 2019

The Impact of War on Development: The Case of Yemen

United Nations Development Programme (UNDP)
New York, NY

Jonathan D. Moyer: *Assessing the impact of conflict in Yemen on SDG achievement*

Site Visit: Asian Demographic Research Institute

International Institute for Applied Systems Analysis
Shanghai, China
Brian O'Neill

Lead Author Meeting of the Sixth Assessment Report

The Intergovernmental Panel on Climate Change (IPCC)
Kathmandu, Nepal

Brian O'Neill: *Convening Lead Author, Key risks across sectors and regions*



The Diplometrics Project

Diplometrics aims to enhance understanding of the international system by gathering, creating, and curating quantitative data on a wide range of state interactions. The project also seeks to develop new insights about relations between states and the other subnational, transnational, and supranational actors that constitute the global system. Unlike some quantitative international relations programs, Diplometrics is not aimed at a single research question or puzzle—such as on the onset of great power war or the emergence of state cooperation—but rather supports broad-based data gathering efforts to better map the past, present, and potential future structures of the international system.

Diplometrics began as a data building and analysis project in 2011, creating data on the Global Power Index (GPI), Diplomatic Representation, International Governmental Organizations (IGOs), and Multilateral Treaties. Since then, the Diplometrics project has expanded significantly to include non-state actors, foreign travel by

heads of government and state, diplomatic capacity, cultural affinity, and soft-power projects among numerous other data initiatives.

Hundreds of students and several full-time staff members have contributed to the Diplometrics project in meaningful ways. One team of researchers has coded a dataset to include the major military equipment holdings for more than 150 countries from 1960 to 2015 across all domains and major weapon types. These data will allow users to compare country military capabilities, makeup, specializations, and potentially create power projections between states. Another team has created the Country and Organization Leader Travel (COLT) database, which covers travel for 213 countries and five international organizations (IOs) from 1990 to 2017. The COLT dataset will help measure diplomatic relations, participation in the international system, bilateral relations between countries, and signals of foreign policy intent.

Since 2011, the Diplometrics Project has been funded by:

U.S. National Intelligence Council

U.S. Army Future Studies Group

U.S. Army Research Office

U.S. Department of Defense Minerva Research Initiative

Diplometrics in the News

The Pardee Center's Diplometrics project was cited in the Economist's March 7, 2019 cover story entitled *The new scramble for Africa: And how Africans could win*. The project's work related to Diplomatic Representation illustrates what the article explains to be "the biggest diplomacy-boom ever," with countries like China, Turkey, and India allocating incredible resources to strengthen ties with countries throughout Africa.

Reports

Achieving Food Security in Uganda

By Steve Hedden, Mickey Rafa, and Jonathan D. Moyer.
Frederick S. Pardee Center for International Futures,
USAID-Uganda

August 2018

A study of various interventions for improving food security in Uganda, in terms of both consumption and production.

Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II, Chapter 29

By Jeremy Martinich, Benjamin DeAngelo, Delavne Diaz, Brenda Ekwurzel, Guido Franco, Carla Frisch, James McFarland, and Brian O'Neill.

Global Change Research Program

November 2018

A congressionally mandated report on the state of science relating to climate change and its physical impacts. The authors conclude that without more significant mitigation efforts, there will be substantial damages caused by climate change on the U.S. economy, human health, and the environment.

Sustainable Development Goals Report: Egypt 2030

By David K. Bohl, Taylor Hanna, Andrew C. Scott, Jonathan D. Moyer, and Steve Hedden.

United Nations Development Programme (UNDP)

November 2018

An integrated look at five alternative scenarios designed to help explore the impact of different policies on economic and social development indicators in Egypt in terms of their ability to accelerate progress toward achieving many of the targets set in the UN's Sustainable Development Goals (SDGs) and Egypt's Sustainable Development Strategy (SDS).

Sustainable Development Goals Report: Mexico 2030

By Taylor Hanna and David K. Bohl.

United Nations Development Programme (UNDP) Bureau for Policy Programme Support

December 2018

An exploration of Mexico's current development trajectory to 2030 across areas of human and economic development. Using the IFs modeling platform, four scenarios are evaluated in terms of their ability to accelerate Mexico's development progress and help the country achieve the targets set by the United Nations' Sustainable Development Goals (SDGs).

Africa's Path to 2063: Choice in the Face of Great Transformation

By Jonathan D. Moyer, David K. Bohl, and Taylor Hanna, in collaboration with Ibrahim Mayaki and Martin Bwalya.

Frederick S. Pardee Center for International Futures, the African Union, and New Partnership for Africa's Development (NEPAD)

February 2019

An integrated approach to thinking about four transformations already taking place in Africa: demography, human development and inequality, technology, and the environment. The analysis seeks to inform policy, investment, and development choices for Africa's pursuit of Agenda 2063 and the United Nations' Sustainable Development Goals (SDGs).

Sixth Global Environmental Outlook (GEO)

United Nations Environment Programme

March 2019

Contributions by Pardee Center researchers:

Steve Hedden, Coordinating Lead Author (Chapter 21); Lead Author (Chapters 22 and 24).

Jonathan D. Moyer, Lead Author (Chapter 21); Contributing Author (Chapter 22).

Barry B. Hughes, Contributing Author (Chapters 21 and 22).

A collaboration between 250 scientists and experts from 70 countries, the report demonstrates that urgent action is required to mitigate the externalized costs of human development and provides analysis of synergies and trade-offs in achieving global environmental targets.

Assessing the Honduran Education System: A Macro Analysis of Current Trends and Possible Futures

By Alex Porter, David K. Bohl, Sarah Dickerson, Barry B. Hughes, Mohammad Irfan, Jonathan D. Moyer, Kanishka Naryan, Andrew Scott, and José Solórzano.

USAID and Frederick S. Pardee Center for International Futures

April 2019

An examination of Honduran educational attainment and test scores across levels (and their drivers), placed within a regional and global context, as well as an investigation of alternative future scenarios that may impact education and broader development indicators.

Assessing the Impact of War on Development in Yemen

By Jonathan D. Moyer, David K. Bohl, Taylor Hanna, Brendan R. Mapes, and Mickey Rafa.

United Nations Development Programme and Frederick S. Pardee Center for International Futures

April 2019

An exploration of the impact of the war in Yemen during the four years since the 2015 escalation and a study of what the country might look like if the fighting continues.

Central America and the Caribbean: Regional Education Report

By Sarah Dickerson, Barry B. Hughes, Mohammad Irfan, Jonathan D. Moyer, Kanishka Naryan, Alex Porter, Andrew Scott, and José Solórzano.

USAID and Frederick S. Pardee Center for International Futures

April 2019

A study of the value of greater investment in education in Central America and the Caribbean and an assessment of education's impacts on various aspects of development, such as emigration, GDP, GDP per capita, poverty, and violence.

The Future of the Guatemalan Education System: A Macro Analysis of Education Quality and Quantity's Impacts on Development

By Alex Porter, David K. Bohl, Sarah Dickerson, Barry B. Hughes, Mohammad Irfan, Jonathan D. Moyer, Kanishka Naryan, Andrew Scott, and José Solórzano.

USAID and Frederick S. Pardee Center for International Futures

April 2019

An examination of Guatemalan educational attainment and test scores across levels (and their drivers), placed within a regional and global context, as well as an investigation of alternative future scenarios that may impact education and broader development indicators.

Journal Articles

"Global Warming Policy: Is Population Left out in the Cold?"

By John Bongaarts and Brian C. O'Neill.

Science

August 2018

An appeal to the climate change community to place more import on population policy in assessment of potential adaptation and mitigation responses designed to reduce risks from global warming.

"Economic and biophysical impacts on agriculture under 1.5 degrees C and 2 degrees C warming"

By Xiaolin Ben, Yaqiong Lu, Brian C O'Neill, and Matthias Weitzel.

Environmental Research Letters

November 2018

An evaluation of the difference in global biophysical and economic impacts related to agriculture between 1.5 and 2.0 degrees celsius warming.

"Alternative Pathways to Human Development: Assessing Trade-Offs and Synergies in Achieving the Sustainable Development Goals"

By Jonathan D. Moyer and David K. Bohl.

Futures

January 2019

An investigation of how achievable the Sustainable Development Goals (SDGs) are across different policy pathways: technology, lifestyle change, and decentralized governance.

"Estimation and Mapping of Sub-national GDP in Uganda Using NPP-VIIRS Imagery"

By Xuanton Wang, Mickey Raza, Jonathan D. Moyer, Jing Li, Jennifer Scheer and Paul Sutton.

Remote Sensing

January 2019

A proposal for using a new enhanced light intensity model (ELIM) to estimate the gross domestic product (GDP) for sub-national units within Uganda.

"Half a Degree and Rapid Socioeconomic Development Matter for Heatwave Risk"

By Simone Russo, Jana Sillmann, Sebastian Sippel, Monika J. Barcikowska, Claudi Ghisetti, Marek Smid, and Brian O'Neill

Nature Communications

January 2019

A projection of indicators of global heatwave risk associated with global warming of 1.5 and 2.0 degrees celsius global warming.

"The Future is a Moving Target: Predicting Political Instability"

By Drew Bowlsby, Erica Chenoweth, Cullen Hendrix, and Jonathan D. Moyer.

British Journal of Political Science

February 2019

A reassessment of Goldstone's predictive model of state-level political instability; the authors find that the drivers of political instability are not constant over time and suggest that care must be exercised in interpreting prediction exercises as evidence in favor or dispositive of theoretical mechanisms.

"Mixed-Member Electoral Systems, Best Loser Results, and the Descriptive Treatment of Women"

By Yann P. Kerevel, Austin S. Matthews, and Katsunori Seki.

Electoral Studies

February 2019

An examination of the extent to which best loser laws impact the election of women using candidate data from sub-national legislatures in Mexico, Germany, and Japan's House of Representatives.

Journal Articles

"The use of the Community Earth System Model in human dimensions climate research and applications"

By Emily K. Laidlaw, Brian C. O'Neill, and Ryan D. Harp.
WIREs Climate Change
March 2019

An examination of trends in societally relevant research that uses one of the world's leading earth system models, concluding that research that applies the model to human dimensions of the climate change issue is growing twice as fast as research limited to the physical sciences alone.

"Understanding food systems drivers: A critical review of the literature"

By Christophe Bene, Steven D. Prager, Harold A.E. Achicanoy, Patricia Alvarez Toro, Leal Lamotte, Camia Bonilla Cedrez, and Brendan R. Mapes
Global Food Security
May 2019

A critical review of the drivers of food systems, including methodological and conceptual issues, and a discussion of the links between drivers and transitional changes within food systems.

Conference Papers

"The Electoral Competitiveness of Working Class Candidates in Germany"

By Yann P. Kerevel and Austin S. Matthews
Southern Political Science Association Annual Meeting
January, 2018

An examination of how professional class status affects the likelihood of party nomination and electoral success for party candidates in regional and national German elections.

Newspapers/Blog Posts

"On Hype and Hyperwar"

By Collin Meisel and Jonathan D. Moyer
Mad Scientist Laboratory
April 4, 2019

A realistic look at consequential trends likely to transform the Future Operational Environment in the coming decades, such as persistent demographic and economic shifts among great powers and the developing world.

"Preparing for China's Rapid Rise and Decline"

By Collin Meisel and Jonathan D. Moyer
War on the Rocks
April 15, 2019

An argument for thinking now about the decline of the Chinese economic system and how strategists can prepare to respond in the future.

"What Happens to Kazakhstan's Dictatorship Now That Its Dictator Has Quit?"

By Austin S. Matthews.
April 25, 2019

The Monkey Cage

An examination of leadership transitions within authoritarian regimes and an assertion that the regime in Kazakhstan will likely survive due to formal institutions put in place by the previous leader.

Books

International Futures: Building and Using Global Models

By Barry B. Hughes
Elsevier Academic Press
2019

Extensive coverage of one of the most advanced systems for integrated, long-term, global and large-scale forecasting analysis available today, the International Futures (IFs) system. Key elements of a strong, long-term global forecasting system are described, i.e. the formulations for the driving variables in separate major models and the manner in which these separate models are integrated. The heavy use of algorithmic and rule-based elements and the use of elements of control theory is also explained.

Policy Briefs

Structural Pressures and Political Instability: Trajectories for Sub-Saharan Africa

by Julia Bello-Schünemann and Jonathan D. Moyer.
September 2018

Institute for Security Studies (ISS)

A report on five models of instability within the International Futures system, which show that the risk from demographics and poor development has eased and will reduce further.

Strategic Foresight Policy Brief: Population and Disease Dynamics' Implications for Direct and Indirect Health Costs to 2030

By Eunice Mogusu and Alanna Markle.

WCG Strategic Foresight: Department of the Premier, Western Cape Government and Frederick S. Pardee Center for International Futures

October 2018

A look at upward pressures on health spending from 2018 to 2030, as well as the economic impacts of the province's burden of disease.

Xcel Energy Carbon Emissions Targets and Limiting Warming to Less than 2.0 Degrees Celsius

By Brian O'Neill and Steve Hedden.

Frederick S. Pardee Center for International Futures

March 2019

An evaluation of Xcel Energy's recently announced goals for carbon emissions reductions and consistency with targets in the Paris Climate Agreement to limit warming to 2.0 degrees celsius or less.

The Silver Dividend: Assessing the Risks and Opportunities of Population Ageing in the Western Cape to 2040

By Alanna Markle and Dale van der Lingen.

WCG Strategic Foresight: Department of the Premier, Western Cape Government and Frederick S. Pardee Center for International Futures

May 2019

An exploration of anticipated growth in the Western Cape's older adult population from 2018 to 2040 and evaluation of the potential for the province to achieve an economic boost, or 'silver dividend', by implementing policies and programs facilitating active aging.

Strategic Foresight Policy Brief: Future Opportunities in Trade and Tourism with the N11 and BRICS

By Alanna Markle.

WCG Strategic Foresight: Department of the Premier, Western Cape Government and Frederick S. Pardee Center for International Futures

June 2019

An overview of key indicators for future trade and tourism potential with the N11 countries, comparing their 2040 trajectories to three BRICS countries, Brazil, Russia, and India.





U.S. Army Future Studies Group

Since 2016, the Pardee Center has worked with the U.S. Army Future Studies Group (AFSG) to help military leaders think about long-term social, political, demographic, technological, and economic trends. In collaboration with AFSG Director Dr. Christopher Rice, our goal is to help the U.S. Army evaluate and plan for the future, particularly in the area of social systems. We build data, conduct analyses, and train Army fellows in IFs and integrated assessment modeling approaches to thinking about--and preparing for--the future. Led by Research Associates Austin Matthews and Collin Meisel, and managed by Whitney Doran, our ongoing work with the AFSG includes scenario development, further incorporation of military geography-relevant variables into IFs, and development of reach, anti-access/area-denial, and overall military capabilities indices.

International Futures by Barry Hughes

In March 2019, *International Futures: Building and Using Global Models* by Barry B. Hughes was published by Elsevier Academic Press (and Science Direct). The volume has two purposes: (1) to explain the International Futures (IFs) model system, and (2) to place it in the context of the larger environment of global modeling. It thereby is commentary on the state of the enterprise of building and using global models, its strengths and challenges.

Founding Director of the Pardee Center and developer of IFs, Dr. Hughes is John Evans Professor at the Korbel School and now serves as Senior Scientist and Mentor to the Center. His principal interests are in global change, computer simulation models for economic, energy, food, population, environmental, and socio-political forecasting, and policy analysis. The fundamental concerns that synthesize these interests are developing effective responses to long-term global change and improving the human condition.

Climate Change Expert Joins Korbel's Pardee Center

By Alyssa Hurst, DU Marketing and Communications

As a kid, Brian O'Neill was already asking the big questions. He wondered what Earth would be like billions of years in the future and envisioned our sun as a red giant well into its lifecycle.

Although he hasn't yet tackled Earth's very distant future, he can tell you what it might look like in, say, 50 years.

O'Neill joined the University of Denver's Frederick S. Pardee Center for International Futures in September. The center is affiliated with the Josef Korbel School for International Studies and known around the world for its work on long-term forecasting and global trend analysis. In addition to his work at DU, O'Neill will continue work as convening

lead author for a chapter in the Intergovernmental Panel on Climate Change's Sixth Assessment Report.

International studies may seem an unusual fit for someone with a background in journalism and earth system sciences, but his current position fosters the necessarily interdisciplinary nature of his work.

O'Neill's research, which builds on past work at the National Center for Atmospheric Research and Austria's International Institute for Applied Systems Analysis, addresses global climate change through integrated assessment. "The broad style of work I do is mostly longer-term, mostly larger-scale," he says. "I particularly focus on global environ-

mental change — mainly climate and societal changes that are relevant to figuring out how serious the climate change issue is and what kinds of things we might be able to do about it.”

According to O’Neill, most environment issues go through a couple of stages of questioning. Stage one scopes out the problem. “Do we have to worry about this?” he says. “Then, when everyone is convinced we need to do something about it, the work shifts to ‘like what?’ What do we know about which options would be effective? Under what conditions?” That’s the meat of O’Neill’s work.

Some of his research focuses on actionable solutions, but he also addresses potential risks of both climate change and its proposed solutions. “There is still a lot we don’t know about what the risks are,” O’Neill explains. “There’s a recent report that came out last fall on how big of a difference it would make if we had 1.5 degrees of warming versus 2 or 3. That answer depends on a large number of things, [like] what are the societal conditions we are assuming will exist when we experience these amounts of warming. If everyone is rich and well-educated and healthy, then you get a completely different risk than if the opposite is true.”

His work sets out to reveal those possible future scenarios, like an accurate and well-researched magic eight ball. “We don’t know what the future is going to hold. It’s uncertain,” he says. “It’s unfortunate we don’t know, but we have to make decisions anyway. So, how do we take into account that uncertainty as best as possible to make effective decisions given that we don’t know how the future is going to turn out?”

Essentially, he says, this work characterizes uncertainty. For example, if researchers want to know what the future of urbanization might look like and how that could affect climate change, O’Neill dives in: “What is a rapidly urbanizing world? How do we know that? What numbers should we use for the high end and the low end? What does a high end mean? Is it the most urbanization we could possibly imagine? What is that even based on?”

Niche though this work may be, O’Neill is not the only one



tackling it. Ten years ago, he joined a group of like-minded researchers from around the world to outline a set of future scenarios to be used by the entire climate science community. “If every study assumes something different about income, population, urbanization, level of technology, it’s very difficult to draw a synthetic conclusion even about a simple, straight-forward question,” O’Neill explains. “If everyone uses the same assumptions, then you can put their results together, and they are comparable in some way.”

Those scenarios have been in use for five years now. And for the first time, the originators and science community are coming together to address them, in what’s been dubbed the Scenarios Forum, scheduled for later this month. The forum will bring more than 300 attendees to DU, where they will address how well the scenarios have served the community so far, and where room for improvement might exist. Once the forum is off O’Neill’s plate, he’ll be focusing more on the campus community, including teaching his first classes this April. “What I’m looking forward to doing more of at DU ... is focusing on the interactions between climate change, the risks it generates and development issues,” he says. “That is something I think is a real strength here — and a real opportunity for me to add to this interdisciplinary area of work.”

Whitney Doran

Whitney Doran earned her M.A. in International Development from the Korb School in 2013 and joined our staff as Project Manager in 2017. In the interim, she served as a Peace Corps Master's International Student and worked as a Community and Youth Development Volunteer in Vanadzor, Armenia. At the Pardee Center, Whitney supervises the Diplometrics project, oversees a large and robust team of student research project aides, and manages the creation and accuracy of millions of data points.

While in the Peace Corps, Whitney conducted research on male migration and female labor markets in Armenia. She first took an interest in the Pardee Center's work on human development and stability versus conflict during her graduate studies. Whitney is proficient in Eastern Armenian, has a working proficiency in Spanish, and is currently learning Russian. In her free time, she enjoys reading, traveling, and long-distance running.

We are grateful to Whitney for helping the Pardee Center organize and push the Diplometrics project ahead. She has instituted processes related to training and project team structures that continue to improve efficiency and quality. Her dedication to professional development for our student researchers is especially admirable; she and her deputy, Alexandra McCollister, have provided RA training, hosted career development workshops, and built collegiality through a series of professional and social events.



Sarah Dickerson

Sarah Dickerson joined us in August of 2018 after earning her Ph.D. in Public Policy from the University of Maryland. In 2012, she completed her M.Sc. in Political Economy of Late Development at the London School of Economics. At the Pardee Center, Sarah has worked on reports for USAID that examine education quality and attainment in Central America and the Caribbean. She has also worked on a research project that explores the relationship between climate change and different aspects of development in sub-Saharan Africa. Prior to working at the Pardee Center, Sarah completed her predoctoral fellowship at the Brookings Institution and consulted for the World Bank and the Carter Center. She also worked in South Africa, where she managed projects that promoted social entrepreneurship in townships outside of Johannesburg.



Project Leads

Inaugural for the 2018/19 academic year, the Project Lead position was created at the Pardee Center to elevate Research Aides who demonstrated leadership and mentorship capabilities within the various projects. Project Leads assumed more responsibilities on their particular projects by overseeing the successful completion of client deliverables, cleaning and vetting of Research Aide-coded data, conducting of formal team meetings, answering content-based questions, and on-boarding and training of new team members.

Through the efforts of Project Leads, the Pardee Center has increased its efficiency and the quality of datasets produced. A new cohort of Project Leads will fulfill the roles of graduating students. We appreciate the contribution of our graduates and look forward to working with our newly selected Project Leads!

Graduating Project Leads

- Alexandra McCollister – Deputy Project Manager
- Scott Lawless – Military Inventory Project Lead
- Zayd Al-marayati – Military Inventory Project Lead
- Dusty Wood – Military Inventory Project Lead
- Katie Hughes – Diplomatic Services Project Lead
- Michael Dendinger – COLT Project Lead
- Ellie Bremer – Data Team Project Lead

Austin S. Matthews

Austin S. Matthews joined us as a Research Associate in September 2018, after receiving his Ph.D. in Political Science from Louisiana State University, with a focus on comparative politics and international relations. His research specializations include authoritarian institutions, state violence, and the politics of Central and Eastern Europe. Austin was the recipient of a U.S. Department of State Title VIII Fellowship in 2016, which he used to acquire critical languages training in Bosnian/Croatian/Serbian. He has been published in Electoral Studies and presented original research at numerous academic conferences. His work at the Pardee Center focuses on issues of international cooperation and conflict such as: foreign influence, formal security agreements, and state sovereignty.



Anajulia Barney

Anajulia Barney joined us in March 2019 as our new Contract and Business Administrator. She manages business and administrative functions for the Pardee Center, including payroll, human resources, grants and contracts processes, and financial reporting. Anajulia hails from Ciudad Juárez, Chihuahua, México and earned her B.B.A. in Human Resources Management from New Mexico State University. She is bilingual in English and Spanish; in her free time she enjoys reading, cooking, hiking, and skiing.



Hamidreza Zoraghein

Research Scientist Hamidreza Zoraghein joined us in July 2018 after working at the National Center for Atmospheric Research (NCAR), where his research focused on studying the socio-economic impacts of environmental change. At the Pardee Center, Hamid will continue this research and broaden its scope, using the massive socio-economic information the IFs model offers. His other responsibilities include advancing the use of quantitative analysis—including predictive modeling techniques and geospatial analytic tools—and providing strategic input on IFs model development.



Taylor Hanna

Taylor Hanna joined our staff as a full-time Research Associate in June 2019. Taylor has been part of the Pardee Center since 2017, when she entered her M.A. program as a research project aide and our first AMG/Pardee Scholar. After graduating in 2018, Taylor worked as a Research Fellow and continued to make significant contributions across a wide range of projects.

Most recently, Taylor co-authored *Assessing the Impact of War on Development in Yemen*, our report for UNDP, as well as a follow-up report to be released in July. She also co-authored *Sustainable Development Goals Report: Mexico 2030* and *Sustainable Development Goals Report: Egypt 2030*, while playing an important role in training sessions for the UNDP in both Mexico and Egypt. She has a proven track record of excellent contributions to our work and we are happy to have her in this new role.

Taylor is from Austin, Texas and obtained her B.A. in Sociology from the University of Texas at Austin. She earned her M.A. (Global Finance, Trade, and Economic Integration) from the Korbel School in 2018. When asked about her hobbies, Taylor reports that she spends her free time evangelizing about breakfast tacos, inadvertently killing houseplants, and, of course, hiking.



Collin Meisel

Collin Meisel began working with the Diplometrics project in October 2018, analyzing a host of issue areas relevant to international politics. Prior to joining the Pardee Center, Collin researched issues related to chemical, biological, radiological, and nuclear terrorism at the National Consortium for the Study of Terrorism and Responses to Terrorism's (START) Unconventional Weapons and Technology division. Before START, he served for eight years as a Security Forces member in the U.S. Air Force, which included leading and advising security teams for Special Air Missions transporting the Vice President of the United States, First Lady, Secretaries of State and Defense, and other national and military leaders domestically and abroad. Collin's recent work at the Pardee Center has included using multivariate regression methods to support the construction and historical validation of bilateral forecasts for shared international governmental organization membership and bilateral trade. He has also supported the U.S. Army Future Studies Group in its exploration of probable scenarios for the future strategic and operational environment, and he is currently laying the groundwork for forthcoming indices of military capabilities, anti-access/area denial, and nation-state reach.







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