

# Anthony C. Janetos

## Curriculum Vitae

### Business Address

Professor and Director  
The Frederick S. Pardee Center for the Study of the Longer-Range Future  
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### Education

Ph.D. (Biology), Princeton University, 1980  
M.A. (Biology), Princeton University, 1978  
A.B. (Biology), *Magna cum Laude*, Harvard University, 1976

### Experience

**2013-Present: Professor and Director, The Frederick S. Pardee Center for the Study of the Longer-Range Future, Boston University.** Directs an interdisciplinary, university-wide research center focused on the evolution of the human condition over periods of decades to centuries. Sponsors graduate student research fellowships on interdisciplinary approaches to problem-solving. Oversees publication programs of the Center, from issue briefs and white papers to seminar and conference volumes. Responsible for performing and directing research on interdisciplinary environmental issues.

**2006-Present: Director, Joint Global Change Research Institute.** Directs a team of researchers in environmental sciences and economics, focusing primarily on developing model frameworks for integrated assessment and analysis of global change. Responsible for initiating and developing new research areas in global change impacts and vulnerability assessment to complement existing strengths in technology assessment and greenhouse gas emissions scenarios. Responsible for program planning and associated development activities. Supervises more than 45 junior and senior technical staff. Performs personal research on ecological responses and adaptation to global change.

Represents the Institute in a variety of public and governmental forums. Serves as a lead author for IPCC, as a coordinator for a national assessment of climate change impacts on the US, and serves on a wide variety of oversight and advisory committees.

**2003-2006: Vice President, H. John Heinz III Center for Science, Economics, and the Environment.** Responsible for overall management and administration of Heinz Center research activities. Lead of strategic planning for the Heinz Center. Responsible for initiating and carrying out a program of policy and scientific research on global change issues, including both climate change and other biological global changes. Responsible for convening and working with an Advisory Committee for global change studies within the Heinz Center, and for providing new research directions for global change issues within the Center. Responsible for development activities. Serves as a Coordinating Lead Author in the Ecosystems Trends and Conditions component of the Millennium Ecosystem Assessment, as a Lead Author in IPCC Working Group II, and on various other external advisory committees.

### **Selected Other Positions and Responsibilities**

**2011-2013. Co-Convening Lead Author (with Henry Jacoby) Mitigation Chapter for the National Climate Assessment.** Responsible for synthesizing the state of knowledge of strategies for reducing emissions of greenhouse gases or increasing their sinks.

**2011-2013. Co-Chair, National Climate Assessment Indicators Working Group.** Responsible for development of a national framework for indicators of climate change, impacts, and response strategies.

**2011-2014. Chair, Long Term Ecological Research Program National Advisory Board.** Responsible for advice and oversight of the LTER network's research activities.

**2011-2012. Vice Chair, Science Steering Committee, IGBP Global Land Project.** Responsible for leading a small group of the steering committee in creating a synthesis of results and findings from more than a decade of research in land science.

**2011-2014. Member, National Academy of Sciences Board on Atmospheric Sciences and Climate.** Responsible for review and participating in BASC activities and panels.

**2011-2012. Member, NRC Committee on Mid-Term Review of NASA's Response to the Decadal Survey on Earth Observations.** Responsible, as part of an NRC committee, for reviewing and reporting on NASA's, NOAA's, and USGS's response to the NAS report on Decadal Survey for Earth Observations.

**2011-2014: Member, NSF Advisory Committee on Environmental Research and Education.** Responsible as part of a broader committee for advising the NSF on new directions in environmental research and education.

*2010-2013. **IPCC Co-Convening Lead Author: Regional Context.*** Chapter 21 in IPCC Working Group 2. Responsible for leading (along with Bruce Hewitson) a team of scientists charged with evaluating the literature on regional issues and providing a context for individual regional chapters in IPCC Working Group 2.

*2010-2013. **Member, NRC Space Studies Board.*** Responsible as part of the Space Studies Board for advice and conducting studies on various aspects of the US Space Program, with particular attention to Earth observations.

*2009-2012. **Member, Science Steering Committee, IGBP Global Land Project.*** Responsible as part of a steering committee for scientific guidance and contributions to the understanding of the interactions of land-cover and land-use change, human decisions about energy and land-use, and the provision of ecological services from the land.

*2007-present. **Chair of Steering Committee, Global Observations of Forest Cover.*** Responsible for overall coordination and oversight of international program on generating observations of forest cover and other land-cover and land-use changes. GOFC is also a panel within the program of Global Terrestrial Observing System.

### **Selected Honors and Awards**

Fellow, Ecological Society of America, 2012

Laboratory Fellow, Pacific Northwest National Laboratory, 2010

Fellow of the American Association for the Advancement of Science, 2007

National Associate of the National Academy of Sciences, 2005

## Fellowships and Grants

US Department of Energy funding to PNNL/ Joint Global Change Research Institute: Integrated Assessment Models and Research (Co-PI with Jae Edmonds) (\$9,000,000 over 3 years) (3 mo effort/yr)(renewed 2012-2015).

US Department of Energy funding to PNNL/Joint Global Change Research Institute: Integrating Integrated Assessment Models with Earth System Models (Co-I) (\$12,000,000 over 4.5 years, joint proposal with Oak Ridge National Laboratory and Lawrence Berkeley National Laboratory) (1 mo effort/yr).

US Department of Energy funding to PNNL/ Joint Global Change Research Institute: Integrated Assessment Models and Research (\$2,000,000) (2 mo effort/yr)

US Department of Energy funding to PNNL/Joint Global Change Research Institute: Regional Integrated Assessment Modeling (PI's: Kathy Hibbard, Benjamin Preston, Anthony Janetos) (\$9,000,000 over 5 years; joint proposal with Oak Ridge National Laboratory) (1 mo effort/yr)

NASA funding to University of Maryland: Integrated Assessment of Coupled Human-Forest Dynamics (PI's: George Hurtt and Anthony Janetos) (Total NASA Funding: \$978,571, JGCRI total amount: \$391,305) (1 mo effort/yr)

NASA funding to University of Maryland: Integrated Assessment Modeling of Major Forest Disturbances (PI's: George Hurtt and Jae Edmonds) (Total NASA Funding: \$1,490,208, JGCRI total amount: \$260,869) (0.5 mo effort/yr)

US Department of Energy funding to the Joint Global Change Research Institute: A Research Agenda for Incorporating Impacts and Adaptation Strategies into Integrated Assessment Models (\$2,200,000)

US Department of Energy funding to the Joint Global Change Research Institute: A Research Agenda for Incorporating Impacts and Adaptation Strategies into Integrated Assessment Models (\$300,000)

US Department of Agriculture grant to the University Corporation for Atmospheric Research (UCAR): Leading the Climate Change Scientific Assessment Product 4.3, Climate Change Impacts on US Ecosystems (\$500,000; co-PI with David Schimel; \$80,000 subaward to JGCRI/PNNL).

World Resources Institute grant to the Heinz Center: Policy Implications of the Millennium Ecosystem Assessment (\$5,000).

Surdna Foundation grant to the Heinz Center: Threshold Responses to Global Change, 2005-2006 (\$75,000)

Renewal grant from Surdna Foundation 2006-2007 (\$75,000)

Heinz Endowment matching grant to the Heinz Center: Threshold Responses to Global Change (\$75,000)

Renewal of Heinz Endowment matching grant 2006-2007 (\$75,000)

Switzer Foundation grant to the Heinz Center for support of postdoctoral researcher, 2005-2006 (\$30,000)

Heinz Endowment matching grant to the Heinz Center for support of postdoctoral researcher, 2005-2006 (\$40,000)

EPA grant to the Heinz Center: Indicators of Ecological Effects of Air Quality, 2005-2008 (\$250,000)

DOE purchase order to the Heinz Center for support on Interagency Working Group for Global Earth Observations, 2004-2006 (\$25,000)

NOAA grant to the Heinz Center for support on Interagency Working Group for Global Earth Observations, 2004-2006 (\$167,000)

Millennium Ecosystem Assessment grant to the Heinz Center for Rapid Assessment of Global Land-Cover Change (\$50,000)

Scientific Committee on Problems in the Environment (SCOPE) grant to the Heinz Center for Forest Management and Conservation in an Information Age, 2003-2003 (\$20,000)

NASA Landsat Global Data Working Group, 2001-2002 (\$137,000)

### **Selected Publications (Last 5 years)**

Julius, Susan H., Jordan M. West, Daniel Nover, Rachel Hauser, David Schimel, Anthony Janetos, Margaret Walsh, Peter Backlund. Climate change and US natural resources: advancing the nation's capability to adapt. Accepted. *Issues in Ecology*.

Turner, B.L. II, Anthony C. Janetos, Peter H. Verburg, Alan T. Murray. Land system architecture: Using land systems to adapt and mitigate global environmental change. In press. *Global Environmental Change*.

Jones, Andrew D., William D. Collins, James Edmonds, Margaret S. Torn, Anthony C. Janetos, Katherine V. Calvin, Allison Thomson, Louise P. Chini, Jiafu Mao, Xiaoying Shi, Peter Thornton, George C. Hurtt, Marshall Wise. In press. Greenhouse gas policy influences climate via direct effects of land-use change. *Journal of Climate*. doi: <http://dx.doi.org/10.1175/JCLI-D-12-00377.1>

Hibbard, Kathy and Anthony C. Janetos. 2013. The regional nature of global challenges: a need and strategy for integrated regional modeling. *Climatic Change*. doi: 10.1007/s10584-012-0674-3

Janetos, Anthony C, Elizabeth Malone, Ariane de Bremond, Erin Mastrangelo, and Karen Hardee. 2012. Linking climate change and development goals: Framing, integrating, measuring. *Climate and Development* 4: 141-156. DOI:10.1080/17565529.2012.726195.

Russell, Lynn M., Philip J. Rasch, Georgina M. Mace, Robert B. Jackson, John Shepherd, Peter Liss, Margaret Leinen, David Schimel, Naomi E. Vaughan, Anthony C. Janetos, Philip W. Boyd, Richard J. Norby, Ken Caldeira, Joonas Merikanto, Paulo Artaxo, Jerry Melillo, and M. Granger Morgan. 2012. Ecosystem Impacts of Geoengineering: A Review for Developing a Science Plan. *Ambio* 41: 350-369. DOI: 10.1007/s13280-012-0258-5.

Janetos, Anthony C., Robert S. Chen, Deke Arndt, Melissa A. Kenney (Coordinating Lead Authors), Daniel Abbasi, Tom Armstrong, Ann Bartuska, Maria Blair, Jim Buizer, Tom Dietz, David Easterling, Jack Kaye, Michael Kolian, Michael McGeehin, Robert O'Connor, Roger Pulwarty, Steve Running, Richard Schmalensee, Robert Webb, Jake Weltzin, Sandra Baptista, Carolyn A.F. Enquist, Jerry Hatfield, Mike Hayes, K. Bruce Jones, Chad McNutt, Walt Meier, Mark D. Schwartz, Mark Svoboda (Contributing Authors). 2012. National Climate Assessment Indicators: Background, Development, and Examples. Technical Input Report for the National Climate Assessment. Washington, DC. March 2012.

Janetos, Anthony C, William Collins, Don Wuebbles, Noah Diffenbaugh, Katharine Hayhoe, Kathy Hibbard, George Hurtt. 2012. Climate Change Modeling and Downscaling: Issues and Methodological Perspectives for the US National Climate Assessment. NCA Report Series, Volume 7. Washington, DC. March 2012.

Van Vuuren, D.P., Riahi, K., Moss, R., Edmonds, J., Thomson, A., Nakicenovic, N., Kram, T., Berkhout, F., Swart, R., Janetos, A., Rose, S.K., Arnell, N. 2012. A proposal for a new scenario framework to support research and assessment in different climate research communities. *Global Environmental Change* 22: 21–35.

Hurtt, GC, LP Chini, S Frolking, R Betts, J Feddema, G Fischer, JP Fisk, K Hibbard, RA Houghton, A Janetos, C Jones, G Kindermann, T Kinoshita, K Klein Goldewijk, K Riahi, E Shevliakova, S Smith, E Stehfest, AM Thomson, P Thornton, DP van Vuuren, Y Wang. 2011. Harmonization of Land-Use Scenarios for the Period 1500-2100: 600 Years of Global Gridded Annual Land-Use Transitions, Wood Harvest, and Resulting Secondary Lands. *Climatic Change* 109: 117-161. DOI: 10.1007/s10584-011-0153-2

Thomson AM, KV Calvin, LP Chini, G Hurtt, JA Edmonds, B Bond-Lamberty, S Frolking, MA Wise, and AC Janetos. 2010. Climate mitigation and the future of tropical landscapes. *Proceedings of the National Academy of Sciences* 107(46):19633-19638 doi/10.1073/pnas.0910467107.

Hibbard, Kathy, A.C. Janetos, D.P. van Vuuren, J. Pongratz, S.K. Rose, R. Betts, M. Herold, J.J. Feddema. 2010. Research priorities in land use and land cover change for the Earth system and integrated assessment modeling. *Int. J. of Climate* 30(13):2118-2128.

Doi/10.1002/joc.2150

Janetos, A.C. Ecosystems. In: Karl, Thomas R., J.M. Melillo, T.C. Peterson (eds). 2009. Global climate change impacts in the United States. US Global Change Research Program.

Janetos, Anthony C., L. Clarke, W. Collins, K. Ebi, J. Edmonds, I. Foster, H.J. Jacoby, K. Judd, L. Leung, R. Newell, D. Ojima, G. Pugh, A. Sanstad, P. Schultz, R. Stevens, J. Weyant, T. Wilbanks, M. Knotek, E. Malone. 2009. Science challenges and future directions: climate change integrated assessment research. Dept. of Energy. Washington, DC. 80 pp.

Wise, Marshall, K. Calvin, A. Thomson, L. Clarke, B. Bond-Lamberty, R. Sands, S. Smith, A. Janetos, and J. Edmonds. 2009. Implications of limiting CO<sub>2</sub> concentrations for land use and energy. *Science* 324: 1183-1186.

Janetos, A.C. 2008. Tipping points, adaptation, and the need for leadership. In: *Coping with Climate Change, Proceedings of a National Summit*. Eds: R. Bierbaum, D. Brown, J. McAlpine. Univ. Mich. Press. Ann Arbor, MI.

CCSP. 2008. The effects of climate change on agriculture, land resources, water resources, and biodiversity. A Report by the US Climate Change Science Program and the Subcommittee on Global Change Research. P. Backlund, A. Janetos, D. Schimel, J. Hatfield, K. Boote, P.Fay, L. Hahn, C. Izaurralde, B.A. Kimball, T. Mader, J. Morgan, D. Ort, W. Polley, A. Thomson, D. Wolfe, M. Ryan, S. Archer, R. Birdsey, C. Dahm, L. Heath, J. Hicke, D. Hollinger, T. Huxman, G. Okin, R. Oren, J. Randerson, W. Schlesinger, D. Lettenmaier, D. Major, L. Poff, S. Running, L. Hansen, D. Inouye, B.P. Kelly, L. Meyerson, B. Peterson, R. Shaw. U.S. Environmental Protection Agency, Washington, DC. USA. 362pp.

Backlund, P., A. Janetos, D.S. Schimel, J. Hatfield, M. Ryan, S. Archer, and D. Lettenmaier. 2008. Executive Summary. In: *The effects of climate change on agriculture, land resources, water resources, and biodiversity. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research*. Washington, DC. USA. 362 pp.

Backlund, P., D. Schimel, A. Janetos, J. Hatfield, M. Ryan, S. Archer, and D. Lettenmaier, 2008. Introduction. In: *The effects of climate change on agriculture, land resources, water resources, and biodiversity. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research*. Washington, DC. USA. 362 pp.

Janetos, A., L. Hansen, D. Inouye, B.P. Kelly, L. Meyerson, B. Peterson, and R. Shaw, 2008. Biodiversity. In: *The effects of climate change on agriculture, land resources, water resources, and biodiversity. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research*. Washington, DC. USA. 362 pp.

Schimel, D., A. Janetos, P. Backlund, J. Hatfield, M. Ryan, S. Archer, D. Lettenmaier, 2008. Synthesis. In: The effects of climate change on agriculture, land resources, water resources, and biodiversity. A Report by the U.S. Climate Change Science Program and the subcommittee on Global Change Research. Washington, DC. USA. 362 pp.

Janetos, A.C. 2008. Where Will Ecosystems Go? In: Sudden and Disruptive Climate Change: Exploring the Real Risks and How We Can Avoid Them. M. MacCracken, F. Moore and J.C. Topping, Jr. (Eds.). Earthscan Books. London, UK.

Janetos, A.C. 2008. Looking back and ahead in ecosystems: reflections on the lessons of the Millennium Ecosystem Assessment. Millennium Ecosystem Assessment: Implications for Global Sustainable Development Policy. M. Munasinghe, J. Ranganathan, and F. Irwin, (Eds.). Edward Elgar Publishing Ltd. Cheltenham, UK.

### **Selected Invited Seminars and Presentations (Last 3 years)**

*Approaches to Modeling Impacts: Snowmass 2013*. Energy Modeling Forum. Snowmass, CO. July 2013.

*Update on National Climate Indicators System*. National Climate Advisory and Developmental Advisory Committee Meeting. Washington, DC. July 2013.

*Scientific Assessment: Policy Communication Successes and Failures*. Hertog Global Strategy Lecture. Columbia University. New York, NY. June 2013

*What to Expect from Climate Impacts Science and Assessment*. AMS Workshop on Climate Information Needs for Financial Decision-Making. Washington, DC. May 2013

*Climate Impacts*. SESYNC Workshop on Sustainable Global Climate Scenarios. Annapolis, MD. May 2013.

*An Overview of Accomplishments of GOF-C-GOLD*. GOF-C-GOLD Program Symposium. Wageningen University, Netherlands. April 2013.

*Mitigation in the National Climate Assessment*. National Climate Assessment Symposium. American Meteorological Society Annual Meeting. Austin, TX, January 2013.

*Progress in Integrated Assessment Modeling*. DOE Town Hall. American Meteorological Society Annual Meeting. Austin, TX, January 2013.

*Developing a System of National Climate Assessment Indicators to Track Climate Change Impacts, Vulnerabilities, and Preparedness*. NEON User Working Group Conference. Washington, DC. November 2012.

*Using an Integrated Assessment Model to Understand Tradeoffs in Ecosystem Services: Energy, Water, Land.* EcoSummit Conference. Columbus, OH. October 2012.

*Integrated Earth System Modeling and Implications for Earth Observations.* Earth and Environment Seminar. Boston University. Boston, MA. September 2012.

*Human-Earth System Interactions and Impacts on the Water Cycle.* Department of Energy Workshop on Integrated Modeling and Science of the Hydrologic Cycle. Washington, DC. September 2012.

*Developing a System of National Climate Assessment Indicators to Track Climate Change Impacts, Vulnerabilities and Preparedness.* Ecological Society of America Annual Meeting. Portland, OR. August 2012.

*Policy Implications and Actions.* Seattle Science Fair. Seattle, WA. June 2012.

*Climate Change Science, Impacts, and the Energy System.* Consulate of Iceland. New York, NY. May 2012.

*Integrated Earth System Model Project Overview.* Department of Energy Office of Science. Germantown, MD. April 2012

*Integrated Assessment Models and Water-Energy Interactions.* ARPA-E Research Conference. Washington, DC. February 2012.

*Climate Impacts and Natural Resources: What Do We Know Now and Why Does It Matter?* Weather and Climate Summit. Breckenridge, CO. January 2012.

*The Role of Land in Climate Policy – and the Role of Climate Policy in the Future of Land Resources Over the Coming Decades.* American Geophysical Union. San Francisco, CA. December 2011.

*Integrated Assessment Modeling: Understanding Interactions of Earth Systems.* Interagency Steering Committee on Multimedia Environmental Modeling. Nuclear Regulatory Commission. Silver Spring, MD. November 2011.

*Integrated Assessments and Their Role in Providing Essential Information for Decision-Making.* NASA Ecosystem and Carbon PI's Meeting. Arlington, VA, October 2011.

*Climate Impacts and Adaptation.* IPIECA Steering Committee. Washington, DC, September 2011.

*Challenges and Progress in Integrated Assessment and Evolution in the Global Change Assessment Model (GCAM).* Department of Energy BER Modeling PI's Meeting. Washington, DC, September 2011.

*The National Climate Assessment: Indicators*. National Climate Assessment Development and Advisory Committee Meeting. Arlington, VA, August 2011.

*Global Change Science for Assessment: Discussion for the NCA* (with Diana Liverman). National Climate Assessment Development and Advisory Committee Meeting. Arlington, VA, August 2011.

*Energy-Water-Land Interactions*. Energy Modeling Forum. Snowmass, CO, August 2011.

*Overview of the Joint Global Change Research Institute and Integrated Assessment*. IGBP Global Land Project Science Steering Committee Meeting. JGCRI, College Park, MD, May 2011.

*Climate Change Impacts on the US*. Guest Lecture at George Mason University Continuing Education. Fairfax, VA, April 2011

*Modeling and Scaling Issues for the National Climate Assessment*. National Climate Assessment Development and Advisory Committee Meeting. Washington, DC, April 2011.

*Including Socioeconomics in Earth System Models*. IGBP Science Symposium, Bethesda, MD, April 2011.

*Evolution and Priorities for the NASA Land-Cover and Land-Use Change Program*. University of Maryland, College Park, MD. March 2011

*Integrated Modeling for Sustainability*. George Mason University. March 2011

*Climate Impacts*. Department of Homeland Security Climate Briefing. Arlington, VA, March 2011.

*Terrestrial Ecosystems, Complexity, and Geoengineering: More Questions than Answers*. IGBP Geoengineering Workshop. Scripps Institute of Oceanography. La Jolla, CA. February 2011.

*Final Panel Discussion: Food for Thought*. EPA Workshop on Integrated Assessment and the Social Cost of Carbon. Washington, DC. January 2011.

*Coordinating Ecosystem Monitoring Networks and Indicators*. NCA Workshop on Ecosystem Structure and Function. Washington, DC. November 2010.

*Structure, Timeline, Products, and Stakeholder Engagement: the First Two Examples*. Planning Meeting for Regional and Sectoral Assessments. Reston, VA. November 2010.

*Knowledge Management: the First (and Second) National Assessments.* Planning Meeting for Knowledge Management. Reston, VA. September 2010.

*Climate Change, Energy and Security: Insights from Models and Vulnerability Studies.* Energy, Climate, and National Security – Challenges and Opportunities for America. St Mary's College, St. Mary's, MD. August 2010.

*Ecosystem Services.* Energy Modeling Forum. Snowmass, CO. July 2010.

*Climate and Land-Use Priorities.* World Wildlife Foundation. Washington, DC. May 2010.

*Documenting and Understanding Ecosystem Changes at Large Scales.* NRC Board on Chemical Sciences and Technology. Washington, DC. April 2010.

*Integrated Assessment Research and Modeling.* Office of Science and Technology Policy. Washington, DC. March 2010

*Climate Impacts.* National Climate Assessment Midwest Stakeholder Outreach Meeting. Chicago, IL. February 2010.

*Climate Impacts and Adaptation.* US-Germany Research Cooperation Workshop. National Science Foundation. Arlington, VA. February 2010.

*The Need to Consider Ecosystem Services.* NAS Workshop on Future Socioeconomic Scenarios. Washington, DC. February 2010.

*Issues in Land-Use Change: Mitigation and Adaptation.* Earth System Science Interdisciplinary Center Seminar. February 2010.