

**EXHIBIT SC-1 (JIF-1)**

# Jeremy I. Fisher, PhD

## Curriculum Vitae

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Synapse Energy Economics  
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### **EMPLOYMENT**

#### **Scientist**

**2007-present**

*Synapse Energy Economics*

- Model and evaluation of avoided emissions from energy efficiency and renewable energy (Utah State, California Energy Commission, US EPA, State of Connecticut),
- Evaluation of health, water, and social co-benefits of energy efficiency and renewable energy (Utah State, Civil Society Institute)
- Develop analysis of water consumption and withdrawals from electricity sector (Stockholm Environment Institute, Union of Concerned Scientists)
- Estimate of compliance costs for environmental regulations (Western Grid Group)
- Development of alternate energy plans for municipalities, states, and regions (Sierra Club Los Angeles, NRDC Michigan, Western Resource Advocates Nevada)
- Price impacts of carbon policy on electricity generators and consumers (NARUC, NASUCA, APPA, NRECA)
- Facilitate and provide energy sector modeling for stakeholder-driven carbon mitigation program in Alaska (Center for Climate Strategies)
- Estimate of greenhouse gas emissions reductions from energy efficiency, agricultural and forestry offsets for all US states (Environmental Defense Fund)
- Economic cost of climate change on energy sector in US and Florida (EDF, NRDC)
- Estimate full costs of nuclear waste decommissioning in West Valley site

#### **Postdoctoral Research Scientist**      **2006-2007**

*Tulane University, Department of Ecology and Evolutionary Biology*

*University of New Hampshire, Institute for the Study of Earth, Oceans, and Space*

- Predicted forest mortality from wind damage using satellite data and ecosystem model
- Analyzed Gulf Coast ecosystem impacts of Hurricane Katrina
- Wrote and organized team synthesis review on causes of natural rainforest loss in the Amazon basin
- Redeveloped ecosystem model to explore carbon ramifications of long-term Amazon disturbance

#### **Visiting Fellow**      **2007-2008**

*Brown University, Watson Institute for International Studies*

- Designed remote sensing study to examine migratory bird response to climate variability in Middle-East

#### **Research Assistant**      **2001-2006**

*Brown University, Department of Geological Sciences*

- Used satellite data to track influence of local and global climate patterns on temperate forest seasonality
- Worked with West African collaborators to determine land-use impact on landscape degradation
- Investigated coastal power plant effluent through multi-temporal satellite data

#### **Remote Sensing Analyst**      **2005-2006**

*Consultant for Geosyntec. in Acton, Massachusetts*

- Mapped estuary from hyperspectral remote sensing data to determine impact of engineered tidal system
- Developed suite of algorithms to correct optical and sensor error in hyperspectral dataset

**Remote Sensing Specialist**                      **2000**  
*3Di, LLC. Remote Sensing Department. Easton, Maryland*

**Research Assistant**                              **1999-2001**  
*University of Maryland, Laboratory for Global Remote Sensing Studies*

- Developed GIS tools for monitoring global ecological trends
- Created thermal model of continental ice properties from microwave satellite data

**EDUCATION**

<b>Ph.D. Geological Sciences</b>	<b>2006</b>	Brown University, Providence, Rhode Island
<b>M.Sc. Geological Sciences</b>	<b>2003</b>	Brown University, Providence Rhode Island
<b>B.S. Geography</b>	<b>2001</b>	University of Maryland, College Park, Maryland
<b>B.S. Geology (<i>honors</i>)</b>	<b>2001</b>	University of Maryland, College Park, Maryland

**WHITE PAPERS**

**Fisher, J.I.** , R. Wilson, N. Hughes, M. Wittenstein, B. Biewald. 2011. Benefits of Beyond BAU. White paper *for* Civil Society Institute. Synapse Energy Economics.

**Fisher, J.I.** and B. Biewald. 2011. Environmental Controls and the WECC Coal Fleet: Estimating the forward-going economic merit of coal-fired power plants in the West with new environmental controls.

Hausman, E.D, V Sabodash, N. Hughes, and **J.I. Fisher**. 2011. Economic Impact Analysis of New Mexico's Greenhouse Gas Emissions Rule. White paper *for* New Energy Economy.

**Fisher, J.I.** and F. Ackerman. 2011. The Water-Energy Nexus in the Western States: Projections to 2100. White paper *for* Stockholm Environment Institute.

**Fisher, J.I.**, J. Levy, Y. Nishioka, P. Kirshen, R. Wilson, M. Chang, J. Kallay, and C. James. 2010. Co-Benefits of Energy Efficiency and Renewable Energy in Utah: Air Quality, Health and Water Benefits. White paper *for* State of Utah.

Hausman, E.D., **Fisher, J.I.**, L.A. Mancinelli, B.E. Biewald. 2009. Productive and Unproductive Costs of CO<sub>2</sub> Cap-and-Trade: Impacts on Electricity Consumers and Producers. White paper *for* the National Association of Regulatory Utility Commissioners, The National Association of State Utility Consumer Advocates (NASUCA), The National Rural Electric Cooperative Association (NRECA), The American Public Power Association (APPA). Synapse Energy Economics.

Bruce E. Biewald **Fisher, J.I.** C James. L. Johnston, D. Schlissel. R. Wilson. 2009. Energy Future: A Green Energy Alternative for Michigan. White paper *for* Sierra Club. Synapse Energy Economics.

James, C. **J.I. Fisher**. K Takahashi. 2009. Alaska Climate Change Strategy’s Mitigation Advisory Group Final Report: Greenhouse Gas Inventory and Forecast and Policy Recommendations Addressing Greenhouse Gas Reduction in Alaska. Energy Supply and Demand Sectors. Submitted to the Alaska Climate Change Sub-Cabinet.

James, C. **J.I. Fisher**. K. Takahashi, B. Warfield. 2009. No Need to Wait: Using Energy Efficiency and Offsets to Meet Early Electric Sector Greenhouse Gas Targets. White paper *for* Environmental Defense Fund. Synapse Energy Economics

James, C., **J.I. Fisher**. **2008** Reducing Emissions in Connecticut on High Electric Demand Days (HEDD). White paper *for* the CT Department of Environmental Protection and the US Environmental Protection Agency. Synapse Energy Economics.

- Hausman, E.D., **J.I. Fisher**, B. Biewald. **2008** Analysis of Indirect Emissions Benefits of Wind, Landfill Gas, and Municipal Solid Waste Generation. White paper for US. Environmental Protection Agency. Synapse Energy Economics.
- Schlissel, D., **J.I. Fisher**. **2008** A preliminary analysis of the relationship between CO<sub>2</sub> emission allowance prices and the price of natural gas. White paper for the Energy Foundation. Synapse Energy Economics.
- Fisher, J.I.**, B. Biewald. **2008** Costly Changes to the Energy Sector. in F. Ackerman and E.A. Stanton. *The Cost of Climate Change*. National Resources Defense Council.
- Fisher, J.I.**, B. Biewald. **2007** Electricity Sector. in E.A. Stanton and F. Ackerman. *Florida and Climate Change: The Costs of Inaction*. Tufts University.

### **PEER-REVIEWED PUBLICATIONS**

- J. T. Morisette, A. D. Richardson, A. K. Knapp, **J.I. Fisher**, E. Graham, J. Abatzoglou, B.E. Wilson, D. D. Breshears, G. M. Henebry, J. M. Hanes and L. Liang. **2009**. Tracking the rhythm of the seasons in the face of global change: Challenges and opportunities for phenological research in the 21st Century. In Press at *Frontiers in Ecology*.
- Fisher, J.I.** G.C. Hurtt, J.Q. Chambers, Q. Thomas. **2008** Clustered disturbances lead to bias in large-scale estimates based on forest sample plots. *Ecology Letters*. 11:6:554-563.
- Chambers, J.Q., **J.I. Fisher**, H. Zeng, E.L. Chapman, D.B. Baker, and G.C. Hurtt. **2007** Hurricane Katrina's Carbon Footprint on U.S. Gulf Coast Forests. *Science*. 318:1107
- Fisher, J.I.**, A.D. Richardson, and J.F. Mustard. **2007** Phenology model from surface meteorology does not capture satellite-based greenup estimations. *Global Change Biology* 13:707-721
- Fisher, J.I.** & J.F. Mustard. **2007** Cross-scalar satellite phenology from ground, Landsat, and MODIS data. *Remote Sensing of Environment* 109:261-273
- Fisher, J.I.**, J.F. Mustard, and M. Vadeboncoeur. **2006** Green leaf phenology at Landsat resolution: Scaling from the field to the satellite. *Remote Sensing of Environment*. 100:2:265-279
- Fisher, J.I.** & J.F. Mustard. **2004** High spatial resolution sea surface climatology from Landsat thermal infrared data. *Remote Sensing of Environment*. 90:293-307.
- Fisher, J.I.**, J. F. Mustard, and P. Sanou. **2004** Policy imprints in Sudanian forests: Trajectories of vegetation change under land management practices in West Africa. *Submitted, International J. Remote Sensing*
- Fisher, J.I.** and S.J. Goetz. **2001** Considerations in the use of high spatial resolution imagery: an applications research assessment. *American Society for Photogrammetry and Remote Sensing (ASPRS) Conference Proceedings*, St. Louis, MO.

### **SELECTED ABSTRACTS**

- J.I. Fisher**. Phenological indicators of forest composition in northern deciduous forests. *American Geophysical Union*. San Francisco, CA. December 2007.
- J.I. Fisher**, A.D. Richardson, and J.F. Mustard. Phenology model from weather station meteorology does not predict satellite-based onset. *American Geophysical Union*. San Francisco, CA. December 2006.
- Chambers, J., **J.I. Fisher**, G Hurtt, T. Baker, P. Camargo, R. Campanella, *et al.*, Charting the Impacts of Disturbance on Biomass Accumulation in Old-Growth Amazon Forests. *American Geophysical Union*. San Francisco, CA. December 2006.
- Fisher, J.I.**, A.D. Richardson, & J.F. Mustard. Phenology model from surface meteorology does not capture satellite-based greenup estimations. *American Geophysical Union. Eos Trans.* 87(52). San Francisco, CA. December 2006.

- Fisher, J.I.**, J.F. Mustard, and M. Vadeboncoeur. Green leaf phenology at Landsat resolution: scaling from the plot to satellite. *American Geophysical Union. Eos Trans.* 86(52). San Francisco, CA. December 2005.
- Fisher, J.I.** and J.F. Mustard. Riparian forest loss and landscape-scale change in Sudanian West Africa. *Ecological Association of America*. Portland, Oregon. August 2004.
- Fisher, J.I.** and J.F. Mustard. High spatial resolution sea surface climatology from Landsat thermal infrared data. *American Society for Photogrammetry and Remote Sensing (ASPRS) New England Region Technical Meeting*. Kingston, Rhode Island. November, 2004.
- Fisher, J.I.**, J.F. Mustard, and P. Sanou. Trajectories of vegetation change under controlled land-use in Sudanian West Africa. *American Geophysical Union. Eos Trans.* 85(47). San Francisco, CA. December 2004.
- Fisher, J.I.** and J.F. Mustard. Constructing a climatology of Narragansett Bay surface temperature with satellite thermal imagery. *The Rhode Island Natural History Survey Conference*. Cranston, RI. March, 2003.
- Fisher, J.I.** and J.F. Mustard. Constructing a high resolution sea surface climatology of Southern New England using satellite thermal imagery. *New England Estuarine Research Society*. Fairhaven, MA. May, 2003.
- Fisher, J.I.** and J.F. Mustard. High spatial resolution sea surface climatology from Landsat thermal infrared data. *Ecological Society of America Conference*. Savannah, GA. August, 2003.
- Fisher, J.I.** and S.J. Goetz. Considerations in the use of high spatial resolution imagery: an applications research assessment. *American Society for Photogrammetry and Remote Sensing (ASPRS) Conference Proceedings*, St. Louis, MO. March, 2001.

### **SEMINARS AND PRESENTATIONS**

- Fisher, J.I.** and B. Biewald. WECC Coal Plant Retirement Based On Forward-Going Economic Merit. Presentation for Western Grid Group. WECC, January 10, 2011.
- Fisher, J.I.** 2010. Protecting Electricity and Water Consumers in a Water-Constrained World. National Association of State Utility Consumer Advocates. November 16, 2010.
- James, C., J.I. **Fisher**, D. White, and N. Hughes. 2010. Quantifying Criteria Emissions Reductions in CA from Efficiency and Renewables. CEC / PIER Air Quality Webinar Series. October 12, 2010.
- Fisher, J.I.** Climate Change, Water, and Risk in Electricity Planning. National Association of Regulatory Utility Commissioners (NARUC), Portland, OR. July 22, 2008.
- Fisher, J.I.** E. Hausman, and C. James. Emissions Behavior in the Northeast from the EPA Acid Rain Monitoring Dataset. Northeast States for Coordinated Air Use Management (NESCAUM), Boston, MA. January 30, 2008.
- Fisher, J.I.** J.F. Mustard, and M. Vadeboncoeur. Climate and phenological variability from satellite data. *Ecology and Evolutionary Biology*, Tulane University. March 24, 2006.
- Fisher, J.I.**, J.F. Mustard, and M. Vadeboncoeur. Anthropogenic and climatic influences on green leaf phenology: new observations from Landsat data. Ecosystems Center at the Marine Biological Laboratory. Woods Hole, MA. Seminar, September 27, 2005.
- Fisher, J.I.** and J.F. Mustard. High resolution phenological modeling in Southern New England. Woods Hole Research Center. Woods Hole, MA. Seminar, March 16, 2005.

### **TEACHING**

<b>Teaching Assistant</b>	<b>2005</b>	Global Environmental Remote Sensing, Brown University
<b>Teaching Assistant</b>	<b>2002 &amp; 2004</b>	Estuarine Oceanography, Brown University
<b>Laboratory Instructor</b>	<b>2002</b>	Introduction to Geology, University of Maryland

### **FELLOWSHIPS**

- 2007** Visiting Fellow, Watson Institute for International Studies, Brown University

- 2003** Fellow, National Science Foundation East Asia Summer Institute (EASI)  
**2003** Fellow, Henry Luce Foundation at the Watson Institute for International Studies, Brown University

**UNIVERSITY SERVICE**

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|-----------------------|------------------|--|
| <b>Representative</b> | <b>2005-2006</b> | Honorary Degrees Committee, Brown University |
| <b>Representative</b> | <b>2004-2006</b> | Graduate Student Council, Brown University   |

**PROFESSIONAL ASSOCIATIONS**

American Geophysical Union; Geological Society of America; Ecological Society of America; Sigma Xi