

# Andrea J. Fassbender

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## Dissertation Research:

My dissertation research is centered on developing novel ways to produce and use data from autonomous sensor platforms to advance our understanding of marine carbon cycling and ocean acidification. One component of this work has been the development of a novel dissolved inorganic carbon (DIC) sensor designed for year-long deployments on moored buoys. This sensor provides new environmental information, in real-time, that significantly improves our ability to autonomously study marine carbon transformations. The second component of my dissertation work has been the establishment of new approaches to analyze data integrated from existing autonomous sensor platforms, satellites, and hydrographic datasets. These approaches make it possible to evaluate interannual variability in biological carbon cycling and to identify which processes are most important for carbon dioxide exchange between the ocean and atmosphere. The aim of this research is to contribute to the formation of a baseline for marine carbon cycling that will make it possible to distinguish future changes and to better understand marine carbon cycle feedback mechanisms.

## Education:

Ph.D. Oceanography University of Washington Advised by Dr. Christopher L. Sabine <i>Ph.D. Candidate as of December 15, 2011</i>	Fall 2014 Seattle, WA
M.S. Oceanography University of Washington Advised by Dr. Christopher L. Sabine	February 2010 Seattle, WA
Graduate Certificate in Climate Sciences University of Washington	June 2009 Seattle, WA
B.S. Combined Honors: Chemistry and Oceanography University of British Columbia <i>Dean's Honor List for academic merit 2004; 2005</i>	June 2007 Vancouver, B.C., Canada

## Fellowships and Awards:

UCAR PACE Postdoctoral Fellowship	2014 - 2016
UW College of the Environment Travel Award (\$750)	2014
UW GSFEI Travel Award (\$500)	2014
IMBER Future Oceans Travel Award (\$2,500)	2014
NSF IGERT Program on Ocean Change Fellowship	2012 - 2014
UW Program on Climate Change Fellowship	2008 - 2009
UW Graduate School Top Scholar Award	2007 - 2008

## Publications in Preparation:

**Fassbender, A.J.**, Sabine, C.L., Meinig, C., and N. Slavas. New capabilities for yearlong carbon cycle studies on moored platforms: field measurements from a novel dissolved inorganic carbon sensor.

Newsom, E., **Fassbender, A.J.**, Bushinsky, S.M., and Maloney, A. Science-policy interactions: a field guide for graduate students.

**Fassbender, A.J.** and C.L. Sabine. Modern baselines for carbon transformations at time-series stations located on the eastern and western boundaries of the subarctic North Pacific carbon sink.

#### Refereed Publications:

Pfeil, B., Olsen, A., Bakker, D.C.E., Hankin, S., Koyuk, H., Kozyr, A., Malczyk, J., Manke, A., Metz, N., Sabine, C.L., et al. (2012) A uniform, quality controlled Surface Ocean CO<sub>2</sub> Atlas (SOCAT). *Earth Syst. Sci. Data Discuss.*, 5, 735-780, doi:10.5194/essdd-5-735-2012. <http://www.earth-syst-sci-data.net/5/125/2013/essd-5-125-2013.html#!>

Sabine, C.L., Hankin, S., Koyuk, H., Bakker, D.C.E., Pfeil, B., Olsen, A., Metz, N., Kozyr, A., **Fassbender, A.J.**, Manke, A., et al. (2012) Gridding of the Surface Ocean CO<sub>2</sub> Atlas (SOCAT) Gridded data products. *Earth Syst. Sci. Data Discuss.*, 5, 781-804, doi:10.5194/essdd-5-781-2012. <http://www.earth-syst-sci-data-discuss.net/5/781/2012/essdd-5-781-2012.html#!>

**Fassbender, A.J.**, C.L. Sabine, R.A. Feely, C. Langdon, and C.W. Mordy (2011): Inorganic carbon dynamics during northern California coastal upwelling. *Cont. Shelf Res.*, 31(11), 1180–1192, doi: 10.1016/j.csr.2011.04.006. <http://www.sciencedirect.com/science/article/pii/S0278434311001336#!>

#### Articles:

Hickey, Hannah. "Citizen scientists: UW students help state legislator with climate policy". *UW Today*. University of Washington, 27 March 2014. Web. 12 June 2014. <http://www.washington.edu/news/2014/03/27/citizen-scientists-uw-students-help-state-legislator-with-climate-policy/>

#### Presentations and Posters:

**Fassbender, A.J.**, Sabine, C.L., Meinig, C., and N. Slavas. "Autonomous ocean carbon monitoring with a moored DIC sensor." IMBER Future Oceans Conference. **Presentation**. Bergen, Norway. June 23-27, 2014.

**Fassbender, A.J.**, Sabine, C.L., Meinig, C., and N. Slavas. "[Autonomous ocean carbon monitoring with a moored DIC sensor](#)." Ocean Sciences Meeting. **Presentation**. Honolulu, HI. Feb. 24-28. 2014.

**Fassbender, A.J.**, Bushinsky, S.M., Maloney, A., and E. Newsom. "[Understanding the use of science in Washington State climate legislation](#)." Ocean Sciences Meeting. **Presentation**. Honolulu, HI. Feb. 24-28. 2014.

**Fassbender, A.J.**, C.L. Sabine, C. Meinig, N. Lawrence-Slavas, P. McLain, C. Cosca, G. Lebon, and J. Resing. "Autonomous ocean carbon monitoring with a moored DIC sensor." University of Washington Program on Climate Change Summer Institute. **Poster**. Friday Harbor, WA. Sept. 12, 2013.

Maloney, A., **A.J. Fassbender**, S. Bushinsky, and E. Newsom. "Understanding the role of science in current ocean and climate legislation in the state of Washington." **Video and poster**. NSF IGERT Video and Poster Competition 2013. Washington D.C. May 21-24, 2013. <http://posterhall.org/igert2013/posters/394>

**Fassbender, A.J.** and S. Bushinsky. "The marine carbon cycle." Program on Climate Change Graduate Student Symposium. **Presentation**. Seattle, WA. Feb. 13, 2013.

**Fassbender, A.J.**, C.L. Sabine, C. Meinig, N. Lawrence-Slavas, P. McLain, T. Smith, J. Resing, and R. Bott. "Autonomous dissolved inorganic carbon sensor for a moored buoy". University of Washington 6<sup>th</sup> Graduate Climate Conference. **Poster**. Eatonville, WA. Oct. 27, 2012.

**Fassbender, A.J.** "The global carbon cycle, experimenting with biosphere 1". University of Washington 6<sup>th</sup> Graduate Climate Conference. **Presentation**. Eatonville, WA. Oct. 27, 2012.

- Fassbender, A.J.**, C.L. Sabine, C. Meinig, N. Lawrence-Slavas, P. McLain, T. Smith, J. Resing, and R. Bott. "Autonomous dissolved inorganic carbon sensor for a moored buoy." Ocean Sciences Meeting. **Poster**. Salt Lake City, UT. Feb. 20-24, 2012.
- Fassbender, A.J.** "Surface ocean DIC dynamics in the North Pacific Ocean." University of Washington Chemlunch Symposium. **Presentation**. Seattle, WA. Oct. 28, 2011.
- Fassbender, A.J.**, C.L. Sabine, S.C. Hankin, A.B. Manke, H. Koyuk, and the SOCAT Synthesis Team. "Surface Ocean CO<sub>2</sub> Atlas (SOCAT): A unique carbon database." Worldwide Universities Network Workshop on Ocean Acidification. **Poster**. Friday Harbor, WA. Aug. 28 – Sept. 2, 2011.
- Fassbender, A.J.** "Inorganic carbon measurements; the science and monitoring of ocean acidification." Program on Climate Change Graduate Student Symposium. **Presentation**. Seattle, WA. Feb. 1, 2011.
- Fassbender, A.J.** "Inorganic carbon dynamics during northern California coastal upwelling." American Geophysical Union Fall Meeting. **Presentation**. San Francisco, CA. Dec. 15, 2010.
- Fassbender, A.J.** "Carbon in the pipeline: Inorganic carbon dynamics during northern California coastal upwelling." University of Washington 4<sup>th</sup> Graduate Climate Conference. **Presentation**. Eatonville, WA. Oct. 16, 2010.
- Fassbender, A.J.** "Inorganic carbon dynamics during northern California coastal upwelling." University of Washington Chemlunch Symposium. **Presentation**. Seattle, WA. Feb. 5, 2010.
- Fassbender, A.J.**, Atwood, A., K. Feifel. "The science behind climate change." Washington State University Extension Carbon Masters Program. **Presentation**. Bothell, WA. Jan. 27, 2010.
- Fassbender, A.J.**, Atwood, A., K. Feifel. "The science behind climate change." Washington State University Extension Carbon Coaches Program. **Presentation**. Seattle, WA. Oct. 8, 2009.
- Fassbender, A.J.**, C.L. Sabine, R.A. Feely, J.M. Hernandez-Ayon, D. Ianson, B. Hales, and L.W. Juranek. "Northern California inorganic carbon and nutrient dynamics during coastal upwelling." University of Washington 3<sup>rd</sup> Graduate Climate Conference. **Poster**. Eatonville, WA. Oct. 16, 2009.

#### **Work and Research Experience:**

University of Washington Research Assistant. Seattle, WA.	Aug. 2007 - present
Deployment of a novel dissolved inorganic carbon sensor on a moored buoy. Oahu, HI.	Oct. 2013
COMPASS Communication Training Workshop	Oct. 19-20, 2013
Design and deployment of a flow through instrument testing system to evaluate the performance of a novel dissolved inorganic carbon sensor at the Seattle Aquarium. Seattle, WA.	April – Sept. 2013
Oregon State University carbon chemist aboard the <i>R/V Wecoma</i> during the 33 day 2007 North American Carbon Program West Coast Cruise.	May - June 2007
University of British Columbia undergraduate thesis: Manganese as a tracer of bottom water renewal in Saanich Inlet, British Columbia. Vancouver, B.C.	2006 - 2007
ThermoEnergy Corporation Chemist during two summer internships. Hudson, MA.	2005; 2006

## Teaching Experience:

University of Washington Osher Lifelong Learning Institute course development and delivery: <i>Ocean change: Why is the ocean changing and what does it mean for the Pacific Northwest?</i> Seattle, WA.	Apr. - May 2014
Graduate Record Exam (GRE) instructor for Kaplan Test Prep. Seattle, WA.	010 - 2014
University of Washington guest lecture for Marine Biology 250: <i>The Ocean's role in the global carbon cycle.</i> Seattle, WA.	Aug. 15, 2013
University of Washington Osher Lifelong Learning Institute course development and delivery: <i>The Ocean's role in global climate.</i> Seattle, WA.	Feb. - March 2013
University of Washington teaching assistant for Chemical Oceanography 400. Seattle, WA.	Jan. - March 2009
Washington State University Extension Carbon Masters Program course development: <i>Global climate change.</i> Seattle, WA.	2008 - 2009

## Outreach:

Mentor and subject for a 10 <sup>th</sup> grade Nathan Hale student Author of Change Project	May-June, 2014
Invited lecture at the Art Institute of Seattle: <i>Ocean Acidification: Impacts in Washington State</i>	May 20, 2014
NOAA Science Camp Speed Networking Event	July 17, 2013
Regional Ocean Sciences Bowl (ORCA Bowl) Volunteer	June 2007; Feb. 2013
Volunteer lecture to Central Washington University students visiting NOAA's PMEL: <i>What it's like to be a grad student at UW/NOAA</i>	March 2, 2012
Volunteer science advisor for an 8 <sup>th</sup> grade student from Issaquah, WA	June 2010
Invited lectures for the Washington State University Carbon Coaches Training Program: <i>Global climate change</i>	Oct. 8 2009; Jan. 27, 2010
Seattle Aquarium Family Science Weekend Volunteer	Nov. 14, 2009
Ocean Inquiry Project Cruise Instructor	Nov. 9, 2008
Vancouver, B.C. Aquarium Aqua News Educator	2006 - 2007

## Committees and Societies:

American Geophysical Union Member	2009 - present
University of Washington Program on Climate Change Member	2007 - present
Organizing Committee for the IGERT Program on Ocean Change Winter seminar series: <i>Topics in Ocean Change</i>	2012 - 2013
Marine Technical Society Member	2008 - 2013
Graduate Student Representative to the University of Washington Program on Climate Change Board (nominated and elected position)	2010 - 2011
Organizing Committee for the 4 <sup>th</sup> Annual Graduate Climate Conference	2009 - 2010
University of Washington Friday Harbor Ocean Acidification Mesocosm Planning Committee	2008