

---

# Michelle E. Newcomer, PhD

Building 85B  
mnewcomer@lbl.gov  
[www.HydrologyLab.com](http://www.HydrologyLab.com)

Cell: (925) 360-9351  
Lawrence Berkeley National Laboratory  
Berkeley, CA 94720  
ORCID: [orcid.org/0000-0001-5138-9026](http://orcid.org/0000-0001-5138-9026)

---

## *Curriculum Vitae*

### **Education**

---

- 2012-2016      **University of California at Berkeley**, *PhD Civil & Environmental Engineering*-GPA: 3.87
- 2006–2012      **San Francisco State University**, *M.S. Geoscience: Hydrogeology* –GPA: 3.78
- 2002–2006      **University of California at Santa Barbara**, *B.A. Sociology & French* –GPA: 3.50
- PhD. Dissertation    “*Bioclogging effects on dynamic permeability and river infiltration*”. May 2016
- M.S. Thesis          “*Recharge Beneath Low-Impact Development and the Effects of Climate Variability*” May 2012. Manuscript published in *Water Resources Research*.

### **Special Training & Skills**

---

MIN3P, R, UNIX, GSSHA, Modflow, Hydrus-3D, PHREEQC, Matlab, ArcGIS 10, ERDAS Imagine, ENVI, Python, C++, Fortran, LabVIEW, SPSS.

### **Research Experience**

---

#### **Lawrence Berkeley National Laboratory, Climate & Ecosystem Sciences: Berkeley, California**

2016: *Post-Doctoral Fellow*                      Member of the Watershed Function SFA 2.0 Team. Analyzing the effects of climate perturbations on hydrological and biogeochemical cycling in hyporheic zones.

#### **UFZ Helmholtz Centre for Environmental Research: Leipzig, Germany**

2013,2014: *Visiting Scholar*                      Conducted hyporheic zone and numerical modeling with scientists at UFZ. My research work focused on assessing groundwater-surface water interactions at the Wohler Riverbank Filtration site along the Russian River, CA working collaboratively with the Sonoma County Water Agency

**NASA Ames Research Center: Science Systems and Applications Inc. DEVELOP National Program**

<p>2010-2012: <i>Center Lead, Research Adviser, Project Coordinator</i></p>	<p>Principal investigator for 3 different applied science research projects. Collaborated research partnerships with the Environmental Protection Agency, the California Department of Water Resources, and the National Park Service. Oversaw the development and implementation of more than 10+ research teams. Developed research topics and wrote project proposals to NASA Headquarters. Participated in outreach events for encouraging students in STEM fields. Member of the DEVELOP strategic planning committee.</p>
<p>2009-2010: <i>Earth Science Research Consultant-Team Leader</i></p>	<p>Lead a team of 5 students on a study analyzing sedimentation in the wetlands of South San Francisco Bay. Responsible for field work and project design, image processing, developing a sedimentation model, statistical analysis, and task delegation. Analyzed sediment samples in the USGS Marine Geology Lab. Primary author on a manuscript for <i>Geocarto International</i>.</p>
<p>2007-2009: <i>Earth Science Research Consultant-Team member</i></p>	<p>Used GIS and remote sensing for an environmental analysis of pine beetle attacks and fire severity in the Okanogan-Wenatchee National Forest, Washington. In charge of field work design, and laboratory analysis experiments. Experience with radar, lidar, hyperspectral, and multispectral image processing.</p>

## **Teaching, Laboratory, and Other Experience**

---

### **Stanford University Pre-Collegiate Institute: *Instructor***

2015: Environmental Science Instructor. Directed all aspects of course preparation and implementation: lectures, assignments, quizzes, and final projects.

### **University of California, Berkeley: *Graduate Student Instructor***

2013-2014: Teaching assistant for an introductory level Hydrology course. Directed student projects, developed and taught 10 lectures to a 50 person class, mentored students one-on-one.

### **San Francisco State University: *Lab Technician-Hydrogeology Laboratory, Hydrogeology Research Group***

2010-2012: Conducted hydrogeology lab work including: building soil-moisture characteristic curves, sediment grain size analysis and measuring bulk density, demonstrated lab and field techniques to undergraduate students.

### **San Francisco State University: *Graduate Teaching Assistant***

2011-2012: Instructed an introductory Oceanography lab for undergraduate students. Responsible for directing field and laboratory activities and gave lectures to a 150 person class.

### **SETI Institute: *Research Assistant***

2009-2011 Analyzed the influences of stress on igneous rock for enhanced electro-corrosion experimentation. Applications for earthquake and water quality studies.

## **Proceedings, Publications & Articles**

---

- 1) **Newcomer, M. E.**, S. S. Hubbard, J. H. Fleckenstein, U. Maier, C. Schmidt, M. Thullner, C. Ulrich, N. Flipo, and Y. Rubin (2016), Simulating bioclogging effects on dynamic riverbed permeability and infiltration, *Water Resour. Res.*, 52, doi:10.1002/2015WR018351.
- 2) Low-Impact Development Boosts Groundwater Recharge. (2014). AGU EOS Transactions, Research Spotlight. Editors Highlight. Vol. 95. No. 23. June. [\[link\]](#)
- 3) **Newcomer, M.E.**, J.J. Gurdak, L. Sklar, L. Nanus. (2014). Urban recharge beneath low impact development and effects of climate variability and change. *Water Resources Research*. Vol. 50. Pgs. 1-16. [\[link\]](#).
- 4) **Newcomer, M.**, A.J.M. Kuss, T. Ketron, A. Remar, V. Choksi, J.W. Skiles. (2013). Estuarine sediment deposition during wetland restoration: A GIS and remote sensing modeling approach. *Geocarto International*. Vol. 29(4). Pgs. 451-467 [\[link\]](#)
- 5) Kuss, A.J.M, W. Brandt, J. Randall, B. Floyd, A. Bourai, **M. Newcomer**, J.W. Skiles, C. Schmidt. (2012). Comparison of changes in groundwater storage using GRACE data and a hydrological model in California's Central Valley. *Proceedings of the American Society for Photogrammetry and Remote Sensing (ASPRS)*. [\[link\]](#)
- 6) Kuss, A.M., W.T. Brandt, J. Randall, B. Floyd, A. Bourai, **M.E. Newcomer**, C. Schmidt, J.W. Skiles. Groundwater Storage Estimates in the Central Valley Aquifer using GRACE satellite data. (2012). *Earthzine IEEE, Theme Article on Water Availability*. [\[link\]](#)
- 7) Hsu, W, A.J.M. Kuss, T. Ketron, A. Remar, A. Nguyen, **M. Newcomer**, E. Fleming, L. Bebout, B. Bebout, A. Detweiler, J.W. Skiles (2011). Hyperspectral Biofilm Classification Analysis for Carrying Capacity of Migratory Birds in the South Bay Salt Ponds. *Proceedings for the William T. Pecora Memorial Remote Sensing Symposium*. [\[link\]](#)
- 8) R.A. Grant, T. Halliday, W.P. Balderer, F. Leuenberger, **M. Newcomer**, G. Cyr, and F. T. Freund. (2011) Groundwater Chemistry Changes before Major Earthquakes and Possible Effects on Animals. *International Journal of Environmental Research and Public Health*.
- 9) **Newcomer, M.**, A.J.M. Kuss, T. Ketron, A. Remar, V. Choksi, J.W. Skiles. (2011). Modeling Sediment Deposition for Predicting Marsh Habitat Development. *Proceedings of the American Society for Photogrammetry and Remote Sensing (ASPRS)*. [\[link\]](#)
- 10) **Newcomer, M.**, W. Hsu, E. Justice, J.W. Skiles. (2011). Prototype Application of NASA Missions for Identifying Patterns of Wetland Vegetation Development. *Proceedings of the American Society for Photogrammetry and Remote Sensing (ASPRS)*. [\[link\]](#)
- 11) Justice, E., **M. Newcomer**, (2010). NASA Ames DEVELOP Interns: Helping the Western United States Manage Natural Resources One Project at a Time. *The Earth Observer*. Vol. 22 (5). Pgs 10-12. [\[link\]](#)
- 12) **Newcomer, M.**, J. Bird, A. Stalzer, G. Sady, S. Sabatine, T. Wheeler, J.W. Skiles, C. Schmidt. (2010). Utilizing NASA Satellite Missions to Identify Bark Beetle Infestation in Sequoia National Park. *Proceedings of the American Society for Photogrammetry and Remote Sensing (ASPRS)*. [\[link\]](#)
- 13) **Newcomer, M.**, C. Gatenbein, D. Delgado, T. Wang, B. Schiffman. (2009). Burn Severity Assessment in the Okanogan-Wenatchee Forest Using NASA Satellite Missions. *Proceedings of the American Society for Photogrammetry and Remote Sensing (ASPRS)*. [\[link\]](#)
- 14) Ballard, M., **M. Newcomer**, J. Rudy, S. Lake, S. Sambasivam, A.W. Strawa, J.W. Skiles, and C. Schmidt, (2008). Understanding the Correlation of San Joaquin Air Quality Monitoring with Aerosol Optical Thickness Satellite Measurements. *Proceedings of the American Society for Photogrammetry and Remote Sensing (ASPRS)*. [\[link\]](#)

### Conference and Professional Presentations (\*Presenting Author)

---

- 1) **Newcomer, M. E.\***, Hubbard, S. S.; Fleckenstein, J. H.; Schmidt, C.; Maier, U.; Thullner, M.; Ulrich, C.; Flipo, N.; Rubin, Y. Riverbed Bioclogging and the Effects on Infiltration and Carbon Flux under Climate Variability. (2015). Oral Presentation. *American Geophysical Union Conference (AGU)*, Abstract # B54B-04. [\[link\]](#) [\[pdf\]](#)
- 2) Hubbard, S\*., H. Wainwright, B. Dafflon and **M. Newcomer**, Next Generation Watershed Characterization using Geophysics, Invited talk, Water Resource Sustainability Issues on Tropical Islands, Hawaii, Dec 2015.

- 3) **Newcomer, M. E.\***, Hubbard, S. S.; Fleckenstein, J. H.; Schmidt, C.; Maier, U.; Thullner, M.; Ulrich, C.; Rubin, Y. Feedbacks between Bioclogging and Infiltration in Losing River Systems. (2014). Poster. *American Geophysical Union Conference (AGU)*, Abstract #B31E-0055. [\[link\]](#)
- 4) **Newcomer, M. E.\***, Hubbard, S. S.; Fleckenstein, J. H.; Schmidt, C.; Maier, U.; Thullner, M.; Ulrich, C.; Rubin, Y. Seasonal Dynamic Permeability Effects on the Transient Connection Status of a River. (2014). Oral presentation. International Water Association (IWA) Conference, San Francisco, 2014.
- 5) **Newcomer, M. E.\***, Hubbard, S. S.; Fleckenstein, J. H.; Schmidt, C.; Maier, U.; Thullner, M.; Ulrich, C.; Rubin, Y. Dynamic Permeability and Clogging Processes of Riverbank Filtration Systems. (2013). Oral presentation. *American Geophysical Union Conference (AGU)*, Abstract #H24A-07. [\[link\]](#)
- 6) Gurdak, J. J.\*; **Newcomer, M. E.**; Sklar, L. S.; Nanus, L. Managed aquifer recharge with low impact development under a changing climate (Invited). (2013). Oral presentation given by J. Gurdak. *American Geophysical Union Conference (AGU)*, Abstract #H11F-1210. [\[link\]](#)
- 7) **Newcomer, M. E.\***; Gurdak, J. J. Climate variability effects on urban recharge beneath low impact development. (2012). Oral presentation. *American Geophysical Union Conference (AGU)*, Abstract #H54F-06. [\[link\]](#)
- 8) **Newcomer, M. E.\***; Gurdak, J. J. Quantifying Recharge Beneath Low Impact Development Under Current and Future Climate Variability. (2012). Oral Presentation. *Groundwater Resources Association Conference*, Rohnert Park, CA. [\[link\]](#)
- 9) **Newcomer, M. E.\***, T. Brandt. Downscaling GRACE Satellite Data for Small-Scale Groundwater Analysis. (2012). Workshop and oral presentation. *Department of Water Resources Briefing*, Sacramento, CA.
- 10) **Newcomer, M. E.\***, College of Science & Engineering Graduate Student Research Showcase (2012). Poster. Quantifying Recharge Beneath Low Impact Development Under Current and Future Climate Variability. *San Francisco State University*.
- 11) **Newcomer, M. E.\***, A. Nguyen. Hyperspectral Mapping of the Invasive Species Pepperweed and Development of a Habitat Suitability Model (2011). Oral presentation. *American Geophysical Union Conference (AGU)*, NASA booth exhibit.
- 12) A comparison of groundwater storage using GRACE data, groundwater levels, and a hydrological model in California's Central Valley (Invited). (2011). Oral presentation given by B. Floyd. *AGU Conference Abstract* #NS13A-07. [\[link\]](#)
- 13) Hyperspectral Biofilm Classification Analysis for Carrying Capacity of Migratory Birds in the South Bay Salt Ponds. (2011). Poster. *AGU Conference Abstract* #B13C-0575. [\[link\]](#)
- 14) Recharge beneath low-impact design rain gardens and the influence of El Niño Southern Oscillation on urban, coastal groundwater resources. (2011). Poster. *AGU Conference Abstract* #H53J-1553. [\[link\]](#)
- 15) Assessment of Groundwater Storage in California's Central Valley using GRACE Data, a Hydrological Model, and *in-situ* Groundwater Levels. (2011). Oral presentation. *Northern California Geological Society*, Danville, CA. [\[link\]](#)
- 16) Groundwater Storage in California's Central Valley. An Analysis using GRACE Data, a Hydrological Model, and *in-situ* Groundwater Levels. (2011). Oral presentation. *Groundwater Resources Association Conference (GRAC)*, Sacramento, CA. [\[link\]](#)
- 17) Estimates of Groundwater Storage using GRACE Data, a Hydrological Model, and Groundwater Levels in California's Central Valley. (2011). Workshop and oral presentation. *Department of Water Resources Briefing*, Sacramento, CA.
- 18) Marsh Habitat Restoration and Sediment Deposition in the South San Francisco Bay. (2011). Oral presentation. *Bay Area Automated Mapping Conference*, San Francisco, CA. [\[link\]](#)
- 19) DEVELOP Program Strategic Planning Report. (2011). *Oral Briefing to NASA Headquarters*, Washington D.C.
- 20) Modeling Sediment Deposition for Predicting Marsh Habitat Development. (2010). Poster. *AGU Conference Abstract* #OS31C-1439. [\[link\]](#)
- 21) Estuarine Sediment Deposition: A GIS and Remote Sensing Analysis. (2010). Invited Lecture, *San Francisco State University*

- 22) Prototype Application of NASA Missions to Identify Patterns of Wetland Vegetation Development within the South San Francisco Bay Salt Ponds. (2010). Poster. *AGU Conference Abstract # EP31B-0742*. [\[link\]](#)
- 23) Identification of Bark Beetle Infestation in Sequoia National Park Using NASA Satellite Missions. (2010). Oral presentation. *ASPRS Conference*, San Diego, CA.
- 24) Aqueous Geochemical Changes in Groundwater along Mechanically Stressed Igneous Rocks. (2010). Guest Presentation- Invited Session, *Livermore Valley Lithophiles*, Livermore, CA.
- 25) Utilizing NASA Satellite Missions to Identify Bark Beetle Infestation in Sequoia National Park. (2009). Poster. *AGU Conference Abstract #B33F-05*. [\[link\]](#)
- 26) Geographic Information Systems and Remote Sensing Technology. (2009). Guest Lecture, Hydrogeology 475, *San Francisco State University*
- 27) Burn Severity Assessment in the Okanogan-Wenatchee Forest Using NASA Satellite Missions. (2009). Oral presentation. *ASPRS Conference*, Baltimore Maryland.
- 28) Understanding the Correlation of San Joaquin Valley Air Quality Monitoring with Aerosol Optical Thickness Satellite Measurements. (2008). Oral presentation. *ASPRS Conference*, Portland, Oregon.

## **Public Outreach, News, Videos, Online Articles, & Blogs**

---

- 1) Earth Scientist Women's Network ESWN Identify with A Scientist. June 2015. [\[link\]](#)
- 2) Sensors Validate California Groundwater Management Techniques. August 2015. [\[link\]](#)
- 3) Under low-impact development, groundwater rates much higher. *Environmental Monitor*. May 2014. [\[link\]](#)
- 4) NASA Feature Article. NASA Ames Scientists Train the Next Generation of Earth Explorers. 2010: [\[link\]](#)
- 5) NASA Ames DEVELOP interns collaborate with the South Bay Salt Pond Restoration Project to monitor and study restoration efforts using NASA's satellites: [\[link\]](#)
- 6) Earthzine: Downscaling GRACE data in the Central Valley aquifer in California: [\[link\]](#)
- 7) Earthzine: NASA Satellites Detect Changes in California's Central Valley Groundwater: [\[link\]](#)
- 8) Earthzine: Hyperspectral Biofilm Classification Analysis to Determine Carrying Capacity for Migratory Birds in the South Bay Salt Ponds: [\[link\]](#)
- 9) Earthzine: Improving Groundwater Storage Estimates in California: [\[link\]](#)

Outreach videos available [here](#).

## **Fellowships, Grants, and Scholarships**

---

- Department of Energy Graduate Student Research Grant (DOE SCGSR) 2015-2016
- Sonoma County Water Agency Research Grant 2014-2015
- Roy G. Post Foundation Scholarship 2014. [\[link\]](#)
- Recipient of the Prestigious Jane Lewis Fellowship 2012-2014, UC Berkeley
- San Francisco State University Graduate Student Grant: 2006-2012
- Geological Society of America (GSA) Graduate Student Research Grant: 2011
- Recipient of the G.A. Harris Graduate Student Fellowship: 2011. [\[link\]](#)
- Groundwater Resources Association, Conference Scholarship: 2010, 2011, 2012
- Research Scholarship, Livermore Valley Lithophiles: 2009 and 2010

- UC Santa Barbara Study Abroad Scholarship: 2005
- Bank of America Joe Martin Scholarship: 2003-2006

## **Awards and Accomplishments**

---

- NASA Group Achievement Award: August 2014
- Best Student Presentation Award. International Water Association Conference. September 2014. San Francisco.
- Water Resources Research Editor's Highlight. February 2014. [\[link\]](#)
- NASA's Applied Sciences DEVELOP National Program Commitment to Service Award: 2012
- San Francisco State University College of Science & Engineering Graduate Distinguished Achievement Award: May 2012
- Recipient of the NASA Group Achievement Award: July 2011
- NASA's Applied Sciences DEVELOP National Program Project Achievement Award: 2008-2012
- Earthzine Honorable Mention for Outstanding Video: 2012
- Dean's List, UC Santa Barbara: 2004
- High School Senior Class Vice-President: 2001-2002
- California Scholarship Federation Academic Achievement Award: 1998-2002
- National Society of Collegiate Scholars Academic Achievement and Member: 1998-present

## **Professional Memberships**

---

- American Water Works Association: 2013-Present
- Association of Engineering Geologists: 2011- Present
- American Society of Civil Engineers: 2011- Present
- American Geophysical Union (AGU): 2009 - Present
- Geological Society of America (GSA): 2010 - Present
- American Society for Photogrammetry and Remote Sensing (ASPRS): 2007- 2012

## **Outreach & Academic Service**

---

UC Berkeley Resume Writing Workshop, 2014

- Worked with undergraduate students to design and edit their resumes

UC Berkeley Statement of Purpose Workshop, 2013

- Mentored undergraduate students writing their statement of purpose for graduate school admissions.

American Society of Civil Engineers Career Seminar "If I knew then what I know now". 2013

- Spoke to undergraduate civil engineering students about graduate school, life after college, working life, and the decision making process on pursuing working versus graduate school. Mentored individual students during break-out sessions.

NASA Ames Girls Go Tech "When I Grow Up..." Career expo, 2011

- Mentored young women in scientific career decisions, and provided scientific demonstrations of growing algal mats and biofilms. [\[link\]](#)

inGenius! Tutoring Learning Center, 2009-2011

- Tutored high school students in AP Environmental Science, Chemistry, Physics and Calculus.

Women's Center Art Gallery, Assistant Curator, UC Santa Barbara, 2003-2004

- Created themes for the art gallery, helped find artwork and set up gallery exhibits

Hermanas Unidas Volunteer Activities, 2002-2005

- Isla Vista Elementary School: Helped elementary school kids with homework and supervised play activities
- Friendship Manor: Helped organize evening movie nights and game nights with seniors

## Websites

---

Google Scholar Profile

- <https://scholar.google.com/citations?user=h6NmRpEAAAAJ&hl=en&oi=ao>

LinkedIn

- <https://www.linkedin.com/in/michellenewcomer>

Blog

- <https://hydrologylab.com/>

San Francisco State University:

- <http://tornado.sfsu.edu/News.html>
- <http://online.sfsu.edu/jgurdak/People.html>

UC Berkeley

- <http://www.ce.berkeley.edu/people/faculty/thompson/students>

Earth Science Women's Network ESWN

- <http://eswnmini.wpengine.com/get-involved/identify-with-a-scientist/michelle-newcomer/>