

## JOHN T. REAGER, II

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### CURRENT POSITION

Scientist, NASA Jet Propulsion Laboratory 2014-present  
California Institute of Technology, Pasadena, CA  
Visiting Researcher, JIFRESSE 2014-present  
University of California, Los Angeles, CA

### EDUCATION

Postdoctoral Researcher, UC Center for Hydrological Modeling 2012-2014  
University of California, Irvine, CA  
PhD Earth System Science, 2012 2007-2012  
University of California, Irvine, CA  
Advisor: Dr. James Famiglietti  
M.S. Physical Ocean Science and Engineering, 2005 2002-2004  
University of Delaware, College of Marine Studies, Newark, DE  
Advisor: Dr. Richard Garvine  
B.S. Aerospace Engineering, B.S. Ocean Engineering, 2001 1996-2001  
Virginia Polytechnic Institute and State University, Blacksburg, VA

### SELECTED AWARDS & HONORS

NOAA David Johnson Award (2016) *for* Innovative application of Earth observation satellite data for operational purposes.  
Newkirk Center for Science and Society Fellowship (2011-2012) *for* Estimating long-range global flood potential using GRACE terrestrial water storage and CMIP precipitation.  
ARCS Foundation Scholar Achievement Award (2010-2012) *for* GRACE and the critical limits of the global water cycle.  
NASA Earth and Space Science Fellowship (2009-2012) *for* Applications of a frequency domain terrestrial water balance using GRACE.

### CURRENT FUNDING AND PROJECTS

*PI:* NASA Science Utilization of SMAP (SUSMAP) [2016-2019] *for* SMAP observations to trace the lifecycle of hydrologic extreme events from land to ocean.  
*PI:* NASA GRACE Science Team [2016-2019] *for* Advancing the science on hydrologic states using GRACE: The role of terrestrial water storage in extreme events.  
*Deputy Project Applications Lead, JPL:* NASA GRACE mission [2015-present]  
*Co-I:* NASA GRACE Science Team [2016-2019] *for* Combining GRACE and GRACE-FO measurements with in-situ GNSS displacements to gain increased spatial resolution of mass flux signals [PI: Wiese].  
*Co-I:* NASA GRACE Science Team [2016-2019] *for* Using GRACE to advance precipitation analysis in cold regions [PI: Behrang].  
*Co-I:* NASA Precipitation Measurement Mission [2016-2019] *for* PMM for Improved Forcing in Hyper-Resolution Land Surface Models [PI: Famiglietti]  
*Co-I:* Jet Propulsion Laboratory Strategic Research & Technological Development: JPL-Water Initiative (2014-2017) [PI: Famiglietti].  
*Co-I:* NASA ROSES: NEWS –Energy and Water Cycle Study [2014-2017] *for* Water cycle change from GRACE and NEWS research [PI: Famiglietti, *as postdoc*].  
*Co-I:* NASA ROSES: Sea Level Change Science Team [2014-2017] *for* Land contributions to regional and global mean sea level rise [PI: Famiglietti, *as postdoc*].

## PEER-REVIEWED PUBLICATIONS

- Castle, S.S.\*, **J.T. Reager**, B.F. Thomas, A.J. Purdy, M. Lo and J.S. Famiglietti (2016) Human contributions to ET in the Colorado River basin, *Geophys. Res. Lett.*, *accepted*.
- Wada, Y., M.-H. Lo, **J.T. Reager** et al. (2016) Fate of water pumped from underground and contributions to sea level rise, *Nature Climate Change*, *accepted*.
- Solander, K. C.\*, **J. T. Reager**, and J. S. Famiglietti (2016), How well will the Surface Water and Ocean Topography (SWOT) mission observe global reservoirs?, *Water Resour. Res.*, 52, 2123-2140.
- Solander, K.C.\*, **J.T. Reager**, B.F. Thomas, C.H. David and J.S. Famiglietti (2016) Simulating the human operator: the development of an optimal complexity, climate-adaptive reservoir management model for an LSM. *J. Hydrometeor.*, *in press*.
- Reager, J.T.**, A.S. Gardner, J.S. Famiglietti, D.N. Weiss, A. Eicker and M.H. Lo (2016) A decade of sea level rise slowed by climate-driven hydrology, *Science*, 351 (6274).
- Famiglietti, J.S., A. Cazenave, A. Eicker, **J.T. Reager**, M. Rodell, and I. Velicogna (2015) Satellites Provide the 'Big Picture' for Global Hydrology. *Science*, 349 (6249).
- Sproles, E.A., S.G. Leibowitz, **J.T. Reager**, P.J. Wigington and S.D. Patil, (2015) GRACE storage-streamflow hystereses reveal the dynamics of regional watersheds. *Hydrol. Earth Sys. Science*, 19 (7), 3253-3272.
- Wu, W.-Y., C.-W. Lan, M.-H. Lo, **J.T. Reager**, J.S. Famiglietti (2015) Increases in the Annual Range of Soil Water Storage at Northern Mid- and High-Latitudes under Global Warming. *Geophys. Res. Lett.*
- Richey, A.S., B.F. Thomas, M.-H. Lo, J.S. Famiglietti, **J.T. Reager**, K.S. Voss, S.C. Swenson and M. Rodell (2015) Uncertainty in Global Groundwater Storage Estimates in a Total Groundwater Stress Framework. *Water Res. Research*.
- Singh, R.S., **J.T. Reager** and N.L. Miller, J.S. Famiglietti (2015) Towards hyper-resolution land surface modeling: The effects of fine-scale model grid resolution on CLM4.0 simulations in the Southwestern US. *Water Res. Research*, 50, doi: 10.1002/2014WR015686.
- Billah, M.M., J.L. Goodall, U. Narayand, **J.T. Reager**, V. Lakshmi, J.S. Famiglietti (2015) Evaluation of regional-scale evapotranspiration estimates using GRACE observations of anomaly in terrestrial water storage: An application to South Carolina, USA. *Journal of Hydrology*, 523, 574-586.
- Bierkens, M.F.P., V.A. Bell, P. Burek, N. Chaney, L. Condon, C.H. David, A. de Roo, P. Döll, N. Drost, J.S. Famiglietti, M. Flörke, D.J. Gochis, P. Houser, R. Hut, J. Keune, S. Kollet, R. Maxwell, **J.T. Reager**, L. Samaniego, E. Sudicky, E.H. Sutanudjaja, N. van de Giesen, H. Winsemius and E.F. Wood (2015) Hyper-resolution global hydrological modeling: what's next? *Hydrological Processes*, 29 (2), 310-320.
- Reager, J.T.**, A.C. Thomas, E.A. Sproles, M. Rodell, H.K. Beaudoin, B.-L. Li, J.S. Famiglietti (2015) Assimilation of GRACE terrestrial water storage observations into a land surface model for the assessment of regional flood potential. *Remote Sensing* 7 (11), 14663-14679.
- Castle, S.S.\*, B.F. Thomas, **J.T. Reager**, M. Rodell, S.C. Swenson and J.S. Famiglietti (2014) Groundwater Depletion During Drought Threatens Future Water Security of the Colorado River Basin. *Geophys. Res. Lett.*, 41, 5904-5911. \*Highlighted in *Science*, *Editors' choice*, "Looking beneath the drying surface", August, 2014, 345, 6198.
- Thomas, A.C.\*, **J.T. Reager**, J.S. Famiglietti and M. Rodell (2014) GRACE-observed water storage deficits for hydrological drought characterization. *Geophys. Res. Lett.*, 41, 1537-1545.
- Reager, J.T.**, B.F. Thomas and J.S. Famiglietti (2014) River basin flood potential inferred using GRACE gravity observations at several months lead-time. *Nat. Geosci.*, 7, 588-592. \*Highlighted in *Science*, "Gravity measurements can predict river flooding", July, 2014.
- Reager, J.T.** and J.S. Famiglietti (2013), Characteristic mega-basin water storage behavior from GRACE. *Water Res. Research*, 49, 3314-3329.
- Reager, J.T.** and J.S. Famiglietti (2009), Global terrestrial water storage capacity and flood potential using GRACE. *Geophys. Res. Lett.*, 36, L23402.
- Tilburg, C.E., M.M. Whitney and **J.T. Reager** (2005), The physics of blue crab larval recruitment in Delaware Bay: A model study. *Journal of Marine Research*, 63, 2, pp. 471-495.
- (\* = Mentored student)

## OTHER PUBLICATIONS

- Famiglietti, J.S., **J.T. Reager**, D. Wiese, M. Rodell, and 27 co-authors (2016), *Water beneath the land surface: the holy grail of hydrologic sciences*, White paper to the National Academies of Sciences Decadal Survey, RF12.
- Manucci, T, C. Chew, A. Koenings, **J.T. Reager**, et al., (2016), *GNSS-R reflections for global high resolution soil moisture*, White paper to the National Academies of Sciences Decadal Survey, RF12.

- Wiese, D., M. Watkins, C. Boening, F. Landerer, **J.T. Reager**, et al., (2016), *Observations of mass flux in the Earth System*, White paper to the National Academies of Sciences Decadal Survey, RF12.
- Lo, Min-Hui, Jay Famiglietti, **J.T. Reager**, Matt Rodell and Sean Swenson (2015), *GRACE-based estimates of global groundwater depletion* in Terrestrial Water Cycle and Climate Change: Natural and Human-Induced Impacts, AGU Geophysical Monograph Series, 22 pp., AGU press.
- Reager, J.T. (2015)**, *The weight of a river basin: using gravity to predict floods* in International Water Power and Dam Construction, Global Trade Media, Volume 67, No. 4, April 2015, pp. 42-45.
- Reager, J.T. (2012)**, Terrestrial water storage across scales: Applications of the GRACE satellite mission for global hydrology. University of California, dissertation #3540046, 110 pp.
- Reager, J.T. (2005)** The ingredients of sub-tidal coastal sea level variability on the Mid-Atlantic Bight, University of Delaware, Masters Thesis, 80 pp.

#### RECENT CONFERENCE PRESENTATIONS (FIRST AUTHOR ONLY)

- Reager, J.T.**, J. Famiglietti, C. David, K. Andreadis, R. Basilio, A. Transgrund (2016) The Western States Water Mission: A high resolution hydrologic modeling and data integration platform. GEWEX North American Regional Hydroclimate Project Workshop, May 2016, Columbia.
- Reager, J.T.**, A. Gardner, D. Wiese, A. Eicker, J. Famiglietti, M. Lo, I. Velicogna, Y. Wada (2016) The importance of land hydrology changes in sea level rise on decadal time scales: results from 2002-2014 using GRACE. European Geophysical Union, Annual assembly, April 2016, Vienna.
- Reager, J.T.**, J. Famiglietti, C. David, K. Andreadis, R. Basilio, A. Transgrund (2016) The Western States Water Mission: A high resolution hydrologic modeling and data integration platform. European Geophysical Union, Annual assembly, April 2016, Vienna.
- Reager, J.T.**, P. Rao, M. Turmon (2015) Towards robust uncertainty quantification in GRACE-based groundwater flux estimates. Invited talk, American Geophysical Union, Fall Meeting, December 2015, San Francisco.
- Reager, J.T.**, J. Famiglietti, A. Gardner, D. Wiese, M. Lo, and A. Eicker (2015) Land contributions to sea level rise. NASA Sea Level Change Team meeting, November 2015, Lake Arrowhead.
- Reager, J.T.**, D. Wiese, J. Famiglietti, A. Gardner, M. Lo, and A. Eicker (2015) GRACE-based land mass trend estimation. NASA GRACE Science Team meeting, September 2015, Austin.
- Reager, J.T.**, J. Famiglietti, C. David, R. Basilio, A. Transgrund, D. Waliser, D. Crichton and M. Gunson (2015), The Western States Water Mission: NASA cyberinfrastructure for the support of water resources management. CUAHSI Hydroinformatics Meeting, July 2015, Tuscaloosa.
- Reager, J.T.** M.H. Lo and J.S. Famiglietti (2014), Effective global soil profile depth and water holding capacity inferred from GRACE time-variable gravity. American Geophysical Union, Fall Meeting, December 2014, San Francisco.
- Reager, J.T.** S.S. Castle, B.F. Thomas, M. Lo, A.J. Purdy, M. Rodell and J.S. Famiglietti (2014) Assessing the impacts of water management on evapotranspiration in the Colorado River Basin. American Geophysical Union, Fall Meeting, December 2014, San Francisco.
- Reager, J.T.**, M.H. Lo, D.P. Chambers and J.S. Famiglietti (2014) Gravity observations show recent land contributions to sea level offset by hydrological cycle variability. American Geophysical Union, Ocean sciences meeting, February 2014, Honolulu.
- Reager, J.T.**, C. de Linage; M. Lo; K. Voss; S.C. Swenson; D.P. Chambers; M. Rodell; J.S. Famiglietti (2013) Emerging Soil and Groundwater Storage Trends from GRACE with Contributions to Global Mean Sea Level Rise, invited talk, American Geophysical Union, Fall meeting, December 2013, San Francisco.
- Reager, J.T.**, B.F. Thomas, E.A. Sproles and J.S. Famiglietti (2013) Gravity for floods: Applications of NASA's GRACE mission to detect, understand, and aid in prediction of large-scale flood events, American Geophysical Union, Fall meeting, December 2013, San Francisco.
- Reager, J.T.**, R.S. Singh, N. Miller, and J.S. Famiglietti (2013) Assimilation of groundwater data into a 1-km version of the CLM using DART, American Geophysical Union, Fall meeting, December 2013, San Francisco.
- Reager, J.T.**, B.F. Thomas, and J.S. Famiglietti (2013) Gravity for floods, invited talk, Joint GRACE/GEWEX meeting, NASA JPL, June 2013, Pasadena.
- Reager, J.T.**, S.C. Swenson, and J.S. Famiglietti (2012) Predictive capability of a gravity-based flood potential, American Geophysical Union, fall meeting, December 2012, San Francisco.
- Reager, J.T.**, M. Lo, J.S. Famiglietti and M. Rodell (2012) Effective global soil parameters from GRACE and impact on land-surface simulations (poster), AGU Chapman conference, February 2012, Kona, Hawaii.

- Reager, J.T.** and J.S. Famiglietti (2011) Characteristic basin water storage behavior using GRACE (poster), American Geophysical Union, Fall Meeting, December 2011, San Francisco.
- Reager, J.T.** and J.S. Famiglietti (2010) Global Terrestrial Water Storage Response and Controls using GRACE (poster), AGU Fall Meeting, December 2010, San Francisco.
- Reager, J.T.** and J.S. Famiglietti (2010) GRACE Science Team Meeting: Propagation of large-scale hydrologic variability in Fourier space (poster), November 2010, GFZ, Potsdam, Germany.
- Reager, J.T.**, M. Rodell and J.S. Famiglietti (2008) American Geophysical Union, Fall Meeting: Terrestrial storage capacity and flood potential using GRACE and GLDAS (poster), December 2008, San Francisco.

#### INVITED SEMINARS, WORKSHOPS AND TEACHING

- NASA hydrology: satellite observations of the terrestrial water cycle*, keynote speaker and lead organizer for CUAHSI workshop on tools and methods in satellite hydrology. Tucson, Arizona, March, 2016.
- Applications of NASA's GRACE satellite mission for land surface hydrology*, Invited lecture for UC Santa Barbara, Department of Geography seminar series. Santa Barbara, California, February, 2016.
- NASA hydrology: satellite observations of droughts floods and water resources*, Keynote speaker for 2016 Steamboat Weather Summit, Steamboat Springs, Colorado, January, 2016.
- The gravity of water: "weighing in" on Earth's changing water resources*, Invited lecturer for NASA Museum Alliance partners Earth science workshop. NASA Jet Propulsion Laboratory, August, 2015.
- Using NASA observations to weigh Earth's changing water resources*. Keynote presenter, 19<sup>th</sup> NASA GLOBE Annual Partners Meeting. Los Angeles, July 2015.
- Closing the gap between the water we need and the water we use*. Presenter for the 2015 Aspen Challenge, a program of the Aspen Institute, Cesar Chavez Learning Academies, January, 2015.
- Using Gravity to understand water*. Keynote speaker for "Our Instrumented Earth": Aquarium of the Pacific 2014 teacher training workshop, at NASA Jet Propulsion Laboratory, October 2014.
- Surface and groundwater impacts of the current California drought*, invited talk and panel at San Gabriel Valley Water Forum, Pomona, CA, October, 2014.
- An introduction to NASA's GRACE mission*. Primary speaker for "Our Instrumented Earth": Aquarium of the Pacific 2013 teacher training workshop, at NASA Jet Propulsion Laboratory, October 2013.
- GRACE and our most precious resource*, Invited lecturer for NASA Museum Alliance partners Earth science workshop. NASA Jet Propulsion Laboratory, April, 2013.
- Precipitation Formation and Streamflow Generation*. 2 Guest lectures, UC Irvine ESS 232, Terrestrial Hydrology, Winter, 2013.
- California's changing water resources*. Invited lecturer, UC Irvine ESS 60B, Local and regional environmental issues, Winter, 2013.
- Southern CA Tribal Listening & Strategy Session on Environmental Issues*. UC Irvine Environment Institute, Irvine, CA, October 2012.
- A chronology of water in the Southwest: Past, present and future of a valuable resource*. Keynote speaker for Drylands Design Conference. Arid Lands Institute, Burbank, CA, March 2012.
- "Weighing in" on Earth's changing water resources*. Invited lecturer for Osher Lifelong Learning Institute, OLLI classroom, Irvine, CA, December 2011.
- GRACE: weighing Earth's water from space*. Invited instructor for International Space University, 2011 Summer Space Studies Program. Infeldgasse Campus, Graz, Austria, July 2011.
- Using GRACE for groundwater*. Invited workshop leader for the UNESCO-IHP GRAPHIC training course on methods for the study of groundwater dynamics. Tozeur, Tunisia, November 2010.
- Joint UCI-JPL Study of Satellite data for Water Resources*. Invited lecturer for Osher Lifelong Learning Institute, OLLI classroom, Irvine, CA, September 2010.
- Teaching Assistant, UC Irvine, Irvine, CA, USA
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|---------------------------------|----------------|
| Oceanography: ESS 3             | [fall, 2009]   |
| GIS for Earth Sciences: ESS 134 | [winter, 2008] |
| Data Analysis: ESS 116          | [fall, 2008]   |

#### PROFESSIONAL SERVICE

- Lead author*, National Academies Decadal Survey, RFI2: Water beneath the land surface. Submitted May 15, 2016.
- Lead organizer*, CUAHSI workshop on 'Methods and tools in satellite hydrology'. Biosphere 2, Tuscon, March 2016.
- Co-convenor*, Observations of the mass contributions to sea level from glaciers, ice sheets and hydrology. Lead Convener: Isabella Velicogna. AGU Fall meeting, December 2015, San Francisco.
- Proposal Reviewer*, NASA ROSES: Indicators for the National Climate Assessment., October, 2015.

Organizer, JPL Water cycle frontiers workshop, Jet Propulsion Laboratory, September 21-22, 2015, Pasadena.  
*Group leader*, Hyper-resolution land surface modeling collaborative, Working Group I: Test case creation. [2014-present]  
*Science Advisor*, NASA DEVELOP program project with the US Forest Service: Using GRACE-derived water and soil moisture products for fire severity forecasting in the Western United States, [2014-2015]  
*Journal Reviewer*: Geophysical Research Letters, Water Resources Research, Journal of Hydrology, Journal of Geophysical Research, Surveys of Geophysics, Climate Dynamics, Remote Sensing.

#### MENTORING & STUDENT SUPERVISION

Armeen Taeb, California Institute of Technology, PhD Computer Science, expected 2017.  
 Hrishikesh Chandanpurkar, University of California, Irvine, PhD Earth System Science, expected 2016.  
 Heloisa Macedo, M.S. student, Northeastern University, M.S. Civil Engineering, expected 2016.  
 Jinny Lee, Cal State LA, M.S., Geology, 2016  
 Kurt Solander, University of California, Irvine, PhD. Earth System Science, 2016.  
 Stephanie Castle, University of California Irvine, M.S. Civil Engineering, 2014.  
 Alys Thomas, University of California, Irvine, PhD. Earth System Science, 2013.  
 Karen An, University of California, Irvine, B.S. Computer Science, 2013.

#### RESEARCH FEATURED IN THE MEDIA

Summary of coverage: A Decade of Sea Level Rise Slowed by Climate Driven Hydrology, 2016:

- Covered by 52 news outlets internationally,
- Top 5% of all research outputs scored by Altmetric (99<sup>th</sup> percentile of all research of the same age)
- More info at: <https://www.altmetric.com/details/5377903/news>

News Story: *Satellites that measure changes in gravity can alert us to potential floods*, Gravity and groundwater, Current Cast Radio program, October 9, 2014. (<http://www.currentcast.org/climate-change/gravity-and-groundwater>)

Interviewed for JPL press release: *Parched West using up underground water*, by Carol Rasmussen, August, 2014. (<http://www.jpl.nasa.gov/news/news.php?release=2014-242>)

Interview for: *Marcy Markusa morning show*, CBC Winnipeg, July 15, 2014.

Interviewed for JPL press release: *NASA satellites give early clues to flood danger*, by Carol Rasmussen, July 10, 2014. (<http://www.jpl.nasa.gov/news/news.php?release=2014-228>)

Interviewed live on: *The morning show*, KCBS San Francisco, July 9, 2014.

Interviewed live on: *The Charles Adler Show*, KJOB Winnipeg, July 9, 2014.

Interviewed on ABC radio news: *NASA satellites used to predict floods*, PM with Mark Colvin, July, 2014. (<http://www.abc.net.au/pm/content/2014/s4041069.htm>)

LiveScience.com featured article: *Early flood prediction gets a boost from space*, by Becky Oskin, July, 2014. [picked up by 40 major news outlets] (<http://www.livescience.com/46671-predicting-river-floods-gravity-satellite.html>)

Science featured article: *Gravity measurements can predict river flooding*, by Eric Hand, Science Magazine, News, July, 2014. [picked up by 24 major news outlets] (<http://news.sciencemag.org/climate/2014/07/gravity-measurements-can-predict-river-flooding>)

Quoted in: *The Dry Life*, on water and climate change in the Southwest US, by Bradford McKee, editor, Landscape Architecture Magazine, October, 2012 issue.

Consultant: *Last Call at the Oasis*, Documentary Feature film, Participant Media, released May, 2012 (<http://www.imdb.com/title/tt2043900/>)

Feature article: *Groundwater, gravity and graphic design*, for Smithsonian.com, Design Decoded blog May, 2012 (<http://blogs.smithsonianmag.com/design/2012/05/groundwater-gravity-and-graphic-design/>)

Feature article: *A challenge to the Design community in California*, for The American Institute of Architects blog, March, 2012, (<http://aiacc.org/2012/03/28/drylands-design-conference-a-challenge-to-the-design-community-in-ca/>)

Feature article: *Gen H2O gets down and dirty*, University of California web article, August, 2009 (<http://www.universityofcalifornia.edu/news/article/21804>)

Feature article: *Satellite flood prediction could save lives*, Discover.com blog, 2009.