

# SEVERINE FOURNIER

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## RESEARCH INTERESTS AND EXPERTISE

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Dr. Severine Fournier pioneered the applications of SMAP ocean salinity and soil moisture measurements to study ocean-water cycle linkages and the synergistic use of satellite salinity and ocean color to study river plumes. Her research focuses on:

- Linkages of the ocean with the Earth water cycle, including land-sea exchanges using principally satellite sea surface salinity, temperature, altimetry, ocean currents and ocean color measurements
- Applications of satellite salinity measurements (from the Aquarius, SMAP, and SMOS missions) to study ocean dynamics
- Synergistic use of multi-mission, multi-variate satellite observations to study ocean variability and integrated Earth system science

## EDUCATION

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- 2010-2014**     **PhD** - Spatio-temporal coherence between spaceborne measurements of salinity and optical properties in the Amazon-Orinoco plume region, **IFREMER** – Satellite Oceanography Laboratory, Brest, France with Nicolas Reul and Bertrand Chapron, with Honors
- 2009-2010**     Research **Master Degree Physical Methods in Remote sensing, University Paris 7**
- 2006-2009**     **ENSTA Bretagne**, Brest, France - Specialization **Hydrography-Oceanography French Graduate Engineering School**  
Category A IHO Certificate
- 2004-2006**     **Lycée Bellevue**, Toulouse, France  
Classes préparatoires, equivalent to the first two years of undergraduate studies: intensive preparation courses for competitive exams to the top French Engineering Schools
- 2001-2004**     **Lycée Pierre Paul Riquet**, Toulouse, France  
Scientific Baccalaureat (High School Diploma), specialization Mathematics, with Honors

## PROFESSIONAL EXPERIENCE

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- 2018-present**     **Scientist**, Ocean Circulation and Air-Sea Interaction group, JPL, Pasadena, CA, USA
- Support for altimetry missions (public engagement, algorithm, El Nino watch, etc.)
  - Science advisor to PO.DAAC for ocean satellite data distribution, archive, and user support
- 2017**             **Caltech Postdoc**, Jet Propulsion Laboratory, Pasadena, CA, USA  
*Researcher in Jet Propulsion Laboratory*
- Use satellite SSS, ancillary satellite and in situ products (e.g., SMAP, Aquarius and SMOS SSS data, MODIS ocean color products, altimetric ocean currents) to analyze the flux of freshwater from land to the ocean and the effects of freshwater forcing on ocean dynamics as part of the SUSMAP project
  - Evaluate SSS products (e.g., Aquarius and SMAP) available at JPL/PO.DAAC on various temporal (synoptic to interannual) and spatial (regional to global) scales
- 2015-2016**     **NASA Postdoctoral Program Fellowship**, Jet Propulsion Laboratory, Pasadena, CA, USA  
*Researcher in Jet Propulsion Laboratory*  
Application of multi-sensor satellite observations to study river plumes and their relationship with other oceanic biophysical properties:
- Investigation of seasonal and interannual variations of sea surface salinity associated with the Mississippi River plume and the underlying physical processes
  - Use of a Lagrangian method to monitor the biophysical properties of water masses in the Amazon River plume
  - Early use of SMAP sea surface salinity data in plume areas
- 2010-2014**     **PhD Thesis**, IFREMER, France  
*Researcher in IFREMER's Satellite Oceanography Laboratory*  
Spatio-temporal coherence between spaceborne measurements of salinity and optical properties in the Amazon-Orinoco plume region:
- Correlation between SMOS sea surface salinity (SSS) and ocean color sensors optical properties

- Establishment of the conservative mixing relationships in the Amazon plume
- SSS retrieval from ocean color in the Amazon plume
- Lagrangian approach of the SSS/optical properties relationship using altimetric currents

**2010**  
5 months

**CLS – Collecte et Localisation par Satellites**, France  
*Research internship in the Space Oceanography Division*  
Intercalibration of an ICESat altimetric database with the conventional altimetric radars:

- Comparisons between ICESat, Jason-1 and ENVISAT data
- Study of cross overs (ICESat-ICESat, ICESat-ENVISAT, ICESat-Jason-1)

**2009**  
5 months

**CARIS BV**, The Netherlands  
*Assistant engineer*  
Study on the influence of input values in the computation of the total depth and horizontal uncertainties of bathymetric data (TPE) and in the computation of a statistical method of processing data (CUBE)

**2008**  
2 months

**Canadian Hydrographic Service**, Canada  
*Hydrographer onboard Coast Guard Ship Matthew, Newfoundland and Labrador*

- Bathymetric acquisitions on a launch
- Bathymetric data processing
- Tide gauges setting up, GPS acquisitions (rocks, coastlines)

## AWARDS

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- 2021** **Charles Elachi Award** for outstanding performance in ocean-water cycle research that expanded the frontier for applications of NASA multi-disciplinary satellite data
- 2021** **JPL Voyager Award** for International Leadership
- 2020** **NASA Early Career Public Achievement Medal** for early career achievement in pioneering research of land-sea-water cycle linkages relevant to NASA Earth Science missions
- 2019** **JPL Voyager Award** – Excellence in research utilizing satellite observations of the ocean, land and atmosphere
- 2014** **NASA Postdoctoral Program (NPP) Fellowship** - Application of multi-sensor satellite observations to study river plumes and their relationship with other oceanic biophysical properties

## PROFESSIONAL ACTIVITIES

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- 2022-present** Deputy Lead of the NASA Ocean Salinity Science Team (OSST)
- 2021-2025** Deputy Chair for the Committee on Space Research (COSPAR) Ocean Dynamics, Productivity and the Cryosphere Commission
- 2021** COSPAR main session organizer “Land-Ocean-Atmosphere exchange”
- 2020-2022** Ocean Sciences Meeting session co-chair “*Ocean Salinity in Support of Scientific and Environmental Demands*”
- 2019** NASA Salinity Continuity Processing Workshop session chair “*Salinity Scientific Analysis*”
- 2018-present** Lead coordinator for Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM) Observing System Report Card
- 2018** Ocean Sciences Meeting session co-chair “*Ocean salinity and its role in ocean dynamics and the water cycle*”
- 2018** NASA Ocean Salinity Science Team and Salinity Continuity Processing Meeting session chair “*Science Applications, feedback to product developers*”

## DIVERSITY, EQUITY, INCLUSION AND ACCESSIBILITY ACTIVITIES

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- 2022-present** JPL coordinator/contact for the Mentoring Physical Oceanography Women to Increase Retention (MPOWIR) speaker series program
- 2021-present** Liaison officer responsible for COSPAR Diversity, Equity and Inclusiveness Policy compliance for the Ocean Dynamics, Productivity and the Cryosphere Commission
- 2021-present** Member of the JPL Earth Science Section DEIA working group

## REVIEW ACTIVITIES

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- 2021** Sentinel 6/Michael Freilich System in Orbit Verification Review Board member  
**2021-present** Member of the Remote Sensing Journal Topic Editorial Board  
**2021** NASA ROSES Carbon Cycle Science Proposal Panel Review  
**2020-present** Participation in mission concept studies at JPL for A-Team and Team X  
**2019-present** NASA FINESST Proposal Panel Review  
**2018** NASA ROSES SPURS Proposal Panel Review  
**2017** NASA ROSES Physical Oceanography Proposal Panel Review  
**2016-2017** NASA NESSF Proposal Panel Review  
**2015-present** Reviewer for the Journal of Geophysical Research: Oceans; IEEE Transactions on Geoscience and Remote Sensing Journal; Geophysical Research Letters Journal; Sensing Journal; Remote Sensing of Environment Journal

## MEDIA ACTIVITIES

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- 2021** KCRW “In our backyard” podcast guest - <https://www.kcrw.com/news/shows/to-the-point/in-our-backyard-no-5-bonus-rising-seas>  
**2021** Invited Speaker at the April BlueTech Global Connect Event - <https://www.youtube.com/watch?v=aZ5u0gBvm3s> and <https://www.youtube.com/watch?v=A6Ay-wpzoel>  
**2020** Public Engagement Video and Live Q&A for the Sentinel 6 Mike Freilich Satellite Mission - <https://www.youtube.com/watch?feature=youtu.be&v=JQVdinYJXds&app=desktop>  
**2020** Research highlighted in a NASA/JPL press release “Prior Weather Linked to Rapid Intensification of Hurricanes Near Landfall” - <https://www.jpl.nasa.gov/news/news.php?feature=7763>  
**2020** Research Insights Interview on the NASA Salinity Website - <https://salinity.oceansciences.org/data-salinity-07.htm>  
**2019** Research highlighted in a NASA/JPL press release “Seasonal Monsoon Rains Block Key Ocean Current” - <https://www.jpl.nasa.gov/news/news.php?feature=7404>  
**2018** Research highlighted on the NASA Earth Science Directorate website “A Year in Review: New Earth Discoveries in 2018” - <https://science.nasa.gov/earth-science/programs/research-analysis/year-in-review-2018/sea-surface-salinity-severe-storms>  
**2018** Research highlighted on the CNES-CLS website - <https://duacs.cls.fr/studies-applications/ocean-eddies-and-river-plume-extension-seen-from-space/>  
**2016** Research highlighted in a NASA/JPL press release “The Lifecycle of a Flood Revealed” - <https://www.jpl.nasa.gov/news/news.php?release=2016-275>

## MENTORING/TUTORING

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- 2023-present** Advisor for JPL postdoctoral fellows Odilon Houndegnonto and Sreelekha Jarugula  
**2021** Mentor for Kollab, a Los Angeles County Alliance for Boys and Girls Clubs program  
**2021** Mentor for the JPL/Caltech Mentoring program (Environmental Science & Engineering (ESE) graduate program)  
**2021** Tutoring in Earth Sciences for Pasadena City College students  
**2020** Mentor for a summer intern at JPL (Karly Ulfsax) from University of North Carolina  
**2019-2021** PhD committee member of Odilon Houndegnonto, LOPS, France – “Study of thermohaline variability of the ocean river plume in the Gulf of Guinea”  
**2017** Co-advisor for a Cal State LA master student in hydrology

## PEER-REVIEWED JOURNAL PUBLICATIONS

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Reager, J.T., Hamlington, B., Landerer, F., and **Fournier, S.** (2023) Water cycle variability drives rapid global sea level ‘burst’ events. *In prep*

Westbrooke, E., Bingham, F.M., Gaube, P., Drushka, K., ..., **Fournier, S.**, ... (2023) SASSIE Narrative. *In prep*

**Fournier, S.**, Reager, J.T., Chandanpurkar, H., Pascolini-Campbell, M., and Jarugula, S. (2023) The salinity of coastal waters as a bellwether for global water cycle changes. *Under review*

Bingham, F.M., **Fournier S.**, Brodnitz, S., Hayashi, A., Kuusela, M., Westbrook, E., Ullsax Carlin, K.M., González-Haro, C., and González-Gambau, V. (2023) Simulated Sea Surface Salinity Data from the ECCO 1/48° Model. *Under review*

Hamlington, B.D., Willis, J.K., Vinogradova, N., Nerem, S., **Fournier, S.** (2023) The Rate of Global Sea-Level Rise Doubled in the Past 30 Years. *Nature Climate Change*. *Under review*

Song Y.T., Callahan P.S., Desjonquieres J.D.M., **Fournier S.** and Willis J.K. (2023) Satellite altimetry and genesis of the 2022 Tonga volcanic tsunami. *Seismological Research Letters*. *Under review*

Vaze, V.P., Willis, J.K., and **Fournier, S.** (2023) Reshaping Earth: How the TOPEX and Jason satellites revolutionized oceanography and redefined climate science. *IEEE Aerospace Conference Proceeding*. *Accepted*

Westbrook, E. E., Bingham, F. M., **Fournier, S.**, and Hayashi, A. (2023). Matchup Strategies for Satellite Sea Surface Salinity Validation. *Remote Sensing*, 15(5), 1242. <https://doi.org/10.3390/rs15051242>

**Fournier, S.**, Bingham, F.M., Hayashi, A., Brodnitz, S., Gonzalez-Haro C., Gonzalez-Gambau V., and Kuusela M. Quantification of Aquarius, SMAP, SMOS and Argo-based gridded sea surface salinity products sampling errors. (2023) *Remote Sens.* 2023, 15(2), 422; <https://doi.org/10.3390/rs15020422>

Hamlington, B.D., Chambers, D.P., Frederikse, T., Dangendorf, S., **Fournier, S.**, Buzzanga, B., Nerem, R.S. Observation-based trajectory of future sea level for the coastal United States tracks near high-end model projections. *Commun Earth Environ* 3, 230 (2022). <https://doi.org/10.1038/s43247-022-00537-z>

Dzwonkowski, B., **Fournier, S.**, Lockridge, G., Coogan, J., Liu, Z., & Park, K. (2022). Hurricane Sally shifts the ocean thermal structure across the inner core during rapid intensification over the shelf. *Journal of Physical Oceanography*. <https://doi.org/10.1002/essoar.10509540.1>

Chandanpurkar H.A., Lee T., Wang X., Zhang H., **Fournier S.**, Fenty I., Fukumori I., Menemenlis D., Piecuch C., Reager J.T., Wang O., Worden J. (2022). Influence of Nonseasonal River Discharge on Sea Surface Salinity and Height. *Journal of Advances in Modeling Earth Systems*, e2021MS002715. <https://doi.org/10.1029/2021MS002715>

Dzwonkowski, B., **Fournier, S.**, Lockridge, G., Coogan, J., Liu, Z., and Park, K. (2021). Cascading weather events amplify the coastal thermal conditions prior to the shelf transit of Hurricane Sally (2020). *Journal of Geophysical Research: Oceans*, 126, e2021JC017957. <https://doi.org/10.1029/2021JC017957>

Bingham, F.M., Brodnitz, S., **Fournier, S.**, Ullsax, K., Hayashi, A., Zhang, H. Sea Surface Salinity Subfootprint Variability from a Global High-Resolution Model. (2021) *Remote Sensing*. 2021, 13, 4410. <https://doi.org/10.3390/rs13214410>

Bingham F.M., **Fournier S.**, Brodnitz S., Ullsax K., Zhang H. Matchup Characteristics of Sea Surface Salinity Using a High-Resolution Ocean Model. (2021). *Remote Sensing*. 2021; 13(15):2995. <https://doi.org/10.3390/rs13152995>

Yu, L., Bingham, F.M., Lee, T., Dinnat, E.P., **Fournier, S.**, Melnichenko, O., Tang, W. and Yueh, S.H. (2021). Revisiting the Global Patterns of Seasonal Cycle in Sea Surface Salinity. *Journal of Geophysical Research: Oceans*, p.e2020JC016789. <https://doi.org/10.1029/2020JC016789>

**Fournier S.**, Lee T. (2021) Seasonal and Interannual Variability of Sea Surface Salinity Near Major River Mouths of the World Ocean Inferred from Gridded Satellite and In-Situ Salinity Products. *Remote Sens.* 13, 728. <https://doi.org/10.3390/rs13040728>

Dzwonkowski, B., Coogan, J., **Fournier, S.**, Lockridge, G., Park, K., & Lee, T. (2020). Compounding impact of severe weather events fuels marine heatwave in the coastal ocean. *Nature communications*, 11(1), 1-10. <https://doi.org/10.1038/s41467-020-18339-2>

**Fournier S.**, Lee T., Wang X., Armitage T.W.K., Wang O., Fukumori I., Kwok R. Sea surface salinity as a proxy for Arctic Ocean freshwater changes. (2020) *Journal of Geophysical Research: Ocean*, e2020JC016110, <https://doi.org/10.1029/2020JC016110>

Reul N., Grodsky S.A., Arias M., Boutin J., Catany R., Chapron B., D'Amico F., Dinnat E., Donlon C., Fore A., **Fournier S.**, Guimbarde S., Hasson A., Kolodziejczyk N., Lagerloef G., Lee T., LeVine D., Lindstrom E., Maes C., Mecklenburg S., Meissner T., Olmedo E., Sabia R., Tenerelli J., Thouvenin-Masson C., Turiel A., Vergely J.L., Vinogradova N., Wentz F., and Yueh S. (2020) Sea Surface Salinity estimates from Spaceborne L-band radiometers: an overview of the first decade of observations (2010-2019). *Remote Sensing of Environment*, Volume 242, 111769, <https://doi.org/10.1016/j.rse.2020.111769>

**Fournier, S.**, Lee, T., Tang, W., Steele, M., Olmedo, E. (2019) Evaluation and Intercomparison of SMOS, Aquarius, and SMAP Sea Surface Salinity Products in the Arctic Ocean. *Remote Sensing*, 11(24), 3043. <https://doi.org/10.3390/rs11243043>

**Fournier, S.**, Reager, J.T., Dzwonkowski, B., Vazquez-Cuervo, J. (2019). Statistical mapping of freshwater origin and fate signatures as land/ocean 'regions of influence' in the Gulf of Mexico. *Journal of Geophysical Research: Oceans*, <https://doi.org/10.1029/2018JC014784>

Vinogradova N., Lee T., Boutin J., Drushka K., **Fournier S.**, Sabia R., Stammer D., Bayler E., Reul N., Gordon A., Melnichenko O., Li L., Hackert E., Martin M., Kolodziejczyk N., Hasson A., Brown S., Misra S., and Lindstrom E. (2019) Satellite Salinity Observing System: Recent Discoveries and the Way Forward. *Frontiers in Marine Science, Frontiers Media*, 2019, 6, pp.243. <https://doi.org/10.3389/fmars.2019.00243>

Lee, T., **Fournier, S.**, Gordon, A. L., and Sprintall, J. (2019). Maritime Continent water cycle regulates low-latitude chokepoint of global ocean circulation. *Nature communications*, 10(1), 2103. <https://doi.org/10.1038/s41467-019-10109-z>

Olmedo, E., Gabarró, C., González-Gambau, V., Martínez, J., Ballabrera-Poy, J., Turiel, A., Portabella, M., **Fournier, S.** and Lee, T. (2018). Seven Years of SMOS Sea Surface Salinity at High Latitudes: Variability in Arctic and Sub-Arctic Regions. *Remote Sensing*, 10(11), p.1772. <https://doi.org/10.3390/rs10111772>

Vazquez-Cuervo J., **Fournier S.**, Dzwonkowski B. (2018) Intercomparison of In-Situ and Remote Sensing Salinity Products in the Gulf of Mexico, a River-Influenced System. *Remote Sens*, 10(10), 1590. <https://doi.org/10.3390/rs10101590>

Dzwonkowski, B., **Fournier, S.**, Reager, J.T., Milroy, S., Park, K., Shiller, A.M., Greer, A.T., Soto, I., Dykstra, S.L. and Sanial, V. (2018). Tracking sea surface salinity and dissolved oxygen on a river-influenced, seasonally stratified shelf, Mississippi Bight, northern Gulf of Mexico. *Continental Shelf Research*, 169, pp.25-33. <https://doi.org/10.1016/j.csr.2018.09.009>

Dzwonkowski, B., **Fournier, S.**, Park, K., Dykstra, S.L. and Reager, J.T. (2018) Water Column Stability and the Role of Velocity Shear on a Seasonally Stratified Shelf, Mississippi Bight, Northern Gulf of Mexico. *Journal of Geophysical Research: Oceans*. <https://doi.org/10.1029/2017JC013624>

Tang, W.; Yueh, S.; Yang, D.; Fore, A.; Hayashi, A.; Lee, T.; **Fournier, S.**; Holt, B. (2018) The Potential and Challenges of Using Soil Moisture Active Passive (SMAP) Sea Surface Salinity to Monitor Arctic Ocean Freshwater Changes. *Remote Sens.*, 10, 869. <https://doi.org/10.3390/rs10060869>

**Fournier S.**, Vialard J., Lengaigne M., Lee T., Gierach M. (2017). Modulation of the Ganges-Brahmaputra river plume by the Indian Ocean Dipole and eddies inferred from satellite observations. *Journal of Geophysical Research: Oceans*, 122. <https://doi.org/10.1002/2017JC013333>

**Fournier, S.**, Vandemark, D., Gaultier, L., Lee, T., Jonsson, B., & Gierach, M. M. (2017). Interannual variation in offshore advection of Amazon-Orinoco plume waters: Observations, forcing mechanisms, and impacts. *Journal of Geophysical Research: Oceans*, 122. <https://doi.org/10.1002/2017JC013103>

**Fournier, S.**, Reager, J. T., Lee, T., Vazquez-Cuervo, J., David, C. H., Gierach, M. M. (2016). SMAP observes flooding from land to sea: The Texas event of 2015. *Geophys. Res. Lett.*, 43, 10,338–10,346, <https://doi.org/10.1002/2016GL070821>

**Fournier S.**, Lee T., Gierach M. (2016). Seasonal and interannual variations of sea surface salinity associated with the Mississippi River plume observed by SMOS and Aquarius. *Remote Sensing of Environment, Volume 180, 2016, Pages 431-439, ISSN 0034-4257, https://doi.org/10.1016/j.rse.2016.02.050*

**Fournier S.**, Chapron B., Salisbury J., Vandemark D., Reul N. (2015). Comparison of spaceborne measurements of Sea Surface Salinity and colored detrital matter in the Amazon plume. *J. Geophys. Res. Oceans*, 120, 3177–3192, <https://doi.org/10.1002/2014JC010109>

Reul N., Quilfen Y., Charpon B., **Fournier S.**, Kudryavtsev V., Sabia R. (2014). Multi-Sensor Observations of the Amazon Orinoco River Plume Interactions with Hurricanes. *J. Geophys. Res. Oceans*, 119, 8271–8295, <https://doi.org/10.1002/2014JC010107>

Reul N., **Fournier S.**, Boutin J., Hernandez O., Maes C., Chapron B., Alory G., Quilfen Y., Tenerelli J., Morisset S., Kerr Y., Mecklenburg S., and Delwart S. (2014). Sea surface salinity observations from space with the SMOS satellite: A new means to monitor the marine branch of the water cycle. *J. et al. Surv Geophys* (2014) 35: 681. <https://doi.org/10.1007/s10712-013-9244-0>

## PEER-REVIEWED BOOK CHAPTERS

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McPhaden, M.J., T. Lee, **S. Fournier**, and M.A. Balmaseda, 2020: ENSO Observations, Chpt.3 in: “El Niño Southern Oscillation in a Changing Climate”, M. J. McPhaden, A. Santoso, and W. Cai, Eds. AGU Geophysical Monograph Series, ISBN: 978-1-119-54812-6. 528pp. Wiley, Hoboken NJ.

Reul N., **Fournier S.**, Boutin J., Hernandez O., Maes C., Chapron B., Alory G., Quilfen Y., Tenerelli J., Morisset S., Kerr Y., Mecklenburg S., and Delwart S. (2014). Sea surface salinity observations from space with the SMOS satellite: A new means to monitor the marine branch of the water cycle. *The Earth's Hydrological Cycle*, Springer

## NON-PEER-REVIEWED PUBLICATIONS

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Willis J., **Fournier S.**, Vaze P. (2022) Reshaping Earth: How the TOPEX and Jason satellites revolutionized oceanography and redefined climate science. Conference paper, 2023 IEEE Aerospace Conference

**Fournier S.**, Willis J., Killett E., Qu Z. and Zlotnicki V., MEASUREs Gridded Sea Surface Height Anomalies Version 2205 (2022), JPL, documentation for a dataset distributed to PO.DAAC, doi:10.5067/SLREF-CDRV3 [https://podaac-tools.jpl.nasa.gov/drive/files/allData/merged\\_alt/L4/docs/Documentation\\_SSH\\_Measures\\_V2205\\_Final.pdf](https://podaac-tools.jpl.nasa.gov/drive/files/allData/merged_alt/L4/docs/Documentation_SSH_Measures_V2205_Final.pdf)

Drushka K., Gaube P., Armitage T., Cerovecki I., Fenty I., **Fournier S.**, Gentemann C., Girton J., Haumann A., Lee T., Mazloff M., Padman L., Rainville L., Schanze J.J., Springer S., Steele M., Thomson J., Wilson E. (2020) A NASA high-latitude salinity campaign, *Community White Paper*. <https://doi.org/10.6084/m9.figshare.12469154.v1>.

Pavelsky, T. M., C. H. David, R. O. Green, **S. Fournier**, C. I. Michailovsky, S. Calmant, J. –F. Cretaux, J. D. Bales, S. Biancamaria, T. S. Bianchi, C. Dupouy, M. M. Gierach, C. B. Jones, B. Laignel, M. P. Lamb, C. J. Legleiter, J. – M. Martinez, J. M. Melack, F. E. Muller-Karger, J. E. Richey, E. Rodriguez, M. Simard, and L. C. Smith (2016), From the Mountains to the Sea: Interdisciplinary Science and Applications Driven by the Flow of Water, Sediment, and Carbon II, *2017-2027 Decadal Survey for Earth Science and Applications from Space of the National Academies of Sciences, Engineering and Medicine*, 2<sup>nd</sup> Request for Information, submitted on 2016-05-17

**Fournier S.** (2014) Spatio-temporal coherence between spaceborne measurements of salinity and optical properties in the Amazon-Orinoco plume region, PhD Thesis

Salisbury J., Vandemark D., **Fournier S.**, Reul N., Chapron B., Mannino A., Wollheim W.M. Linking the continental landmass to biogeochemical variability in the coastal ocean: the role of hydrological models and new satellite ocean color and salinity sensors (2012). *AGU Fall Meeting Proceedings, Abstracts, 1, L06*.

Reul N., Chapron B., Tenerelli J., **Fournier S.**, Quilfen Y. Sea Surface Salinity observations from Space: A new tool to monitor the oceanic freshwater cycle as well as ocean/land and ocean/atmosphere interactions (2012). *EGU General Assembly Conference Proceedings, Abstracts 14, 8720*.

**Fournier S.**, Reul N., Charpon B., Tenerelli J. Spatio-temporal coherence between spaceborne measurements of Salinity and Light Absorption in the Amazon plume region. (2011) *ESA-SOLAS, Earth Observation for Ocean Atmosphere Interaction Science Proceedings. ESA Special Publication 703, 10*.

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## FUNDED PROPOSALS

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**2022-2026** PI: Coastal Salinity, a proxy for human and natural hydrological cycle changes. *ROSES 2021, Ocean Salinity Science Team [PI: Fournier]*

**2021-2024** Deputy PI: Salinity and stratification at the sea ice edge. *ROSES 2020, Ocean Salinity Field Campaign [PI: Drushka]*

**2021-2024** Co-I: An investigation of mechanisms that drive compounding connections between tropical cyclones and marine heatwaves in the coastal ocean. *ROSES 2020, Physical Oceanography [PI: Dzwonkowski]*

**2020-2023** PI: OSCAR Continuity Project. *Unsollicited Proposal [PI: Fournier]*

**2020-2023** PI: Satellite sea surface salinity sampling error. *ROSES 2019, Ocean Salinity Science Team [PI: Fournier]*

**2018-2020** Co-I: Evaluation of Sea Surface Salinity Retrievals for the Arctic Ocean From L-band Satellites Using In-situ Observations and Satellite Altimetry and Gravimetry. *Unsollicited Proposal [PI: Lee]*

**2016-2019** Science PI: SMAP observations to trace the lifecycle of hydrologic extreme events from land to ocean. *ROSES 2015, Science Utilization of the SMAP Mission [PI: Reager]*

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## INVITED TALKS

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**Fournier S.**, Ocean salinity, a key parameter to study land-sea linkages and river plumes. *Ocean Salinity Conference, 6-9 June 2022, New York, USA – invited oral presentation*.

**Fournier S.**, Arctic Ocean Freshwater Changes as detected by sea surface salinity, sea level and ocean bottom pressure. *Salinity Science Seminar (FOR1740 + CCI+SSS User meeting), 26-27 September 2019, Hamburg, Germany – invited oral presentation*.

**Fournier S.**, Ocean salinity, a key parameter to study the linkages of the oceans with the terrestrial water cycle. *AGU Fall Meeting, 10<sup>th</sup> – 14<sup>th</sup> December 2018, Washington, DC, USA – invited oral presentation*.

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## CONFERENCES

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**Fournier S.**, T. Lee, W. Tang, M. Steele, E. Olmedo. Evaluation and Intercomparison of SMOS, Aquarius and SMAP Sea Surface Salinity Products in the Arctic Ocean. *COSPAR Scientific Assembly – 28<sup>th</sup> January – 4<sup>th</sup> February 2021, Sydney, Australia – oral presentation*

**Fournier S.**, JT Reager, B. Dzwonkowski, J. Vazquez. Statistical mapping of freshwater origin and fate signatures as land/ocean 'regions of influence' in the Gulf of Mexico. *COSPAR Scientific Assembly – 28<sup>th</sup> January – 4<sup>th</sup> February 2021, Sydney, Australia – oral presentation*

**Fournier S.**, and T. Lee. Seasonal and interannual variability of SMOS, SMAP and Argo sea surface salinity at the top 10 river mouths worldwide. *AGU Fall Meeting, 1st – 17th December 2020, remote – oral presentation*

**Fournier S.**, T. Lee, W. Tang, M. Steele, E. Olmedo. Evaluation and Intercomparison of SMOS, Aquarius and SMAP Sea Surface Salinity Products in the Arctic Ocean. *Ocean Sciences Meeting, 16<sup>th</sup> – 21<sup>st</sup> February 2020, San Diego, USA – poster*

**Fournier S.**, JT Reager, B. Dzwonkowski, J. Vazquez. Statistical mapping of freshwater origin and fate signatures as land/ocean 'regions of influence' in the Gulf of Mexico. *AGU Fall Meeting – 9<sup>th</sup> – 13<sup>th</sup> December 2019, San Francisco CA, USA – oral presentation*

**Fournier S.**, T. Lee, W. Tang, M. Steele, E. Olmedo. Intercomparison of satellite Sea Surface Salinity observations in the Arctic Ocean. *Ocean Obs 2019, 15<sup>th</sup> – 20<sup>th</sup> September 2019, Honolulu, HI, USA – poster*

**Fournier S.**, T. Lee, M. Steele, X. Wang, I. Fukumori, R. Kwok, and O. Wang. Arctic Ocean Freshwater Changes as detected by sea surface salinity, sea level and ocean bottom pressure. *Salinity Science Seminar, CCI+SSS User meeting, 26<sup>th</sup> – 27<sup>th</sup> September 2019, Hamburg, Germany – oral presentation*

**Fournier S.**, Lee T., Tang W., Steele M., Yueh S., and Olmedo E., Intercomparison of SMOS, Aquarius and SMAP Sea Surface Salinity Products in the Arctic Ocean. *Ocean Salinity Science Team and Salinity Continuity Processing meeting, 29<sup>th</sup> April – 1<sup>st</sup> May 2019, Santa Rosa, CA, USA – oral presentation*

Reager J.T., **Fournier S.**, Dzwonkowski B., Vazquez-Cuervo, J., *Using SMAP to study land-ocean fluxes in the Gulf of Mexico. AGU Fall Meeting, 10<sup>th</sup> – 14<sup>th</sup> December 2018, Washington, DC, USA – oral presentation.*

**Fournier S.**, Lee T., Wang X., Kwok R. Exploring the Synergy of Sea Surface Salinity, Sea Surface Height and Ocean Bottom Pressure to Study Arctic Ocean Freshwater Changes. *Ocean Salinity Science Workshop, 5<sup>th</sup> – 9<sup>th</sup> November 2018, Paris, France*

**Fournier S.**, Lee T., Wang X., Kwok R. Exploring the Synergy of Sea Surface Salinity, Sea Surface Height and Ocean Bottom Pressure to Study Arctic Ocean Freshwater Changes. *25 Years of Progress in Radar Altimetry Symposium, 24<sup>th</sup> – 29<sup>th</sup> September 2018, Ponta Delgada, Azores Archipelago, Portugal – oral presentation.*

**Fournier S.**, Lee T., Steele M., Intercomparison of satellite Sea Surface Salinity observations in the Arctic Ocean. *Ocean Salinity Science Team and Salinity Continuity Processing meeting, 27<sup>th</sup> – 29<sup>th</sup> August 2018, Santa Rosa, CA, USA – oral presentation*

**Fournier S.**, Vialard J., Lengaigne M., Lee T., Gierach M. Modulation of the Ganges-Brahmaputra river plume by the Indian Ocean Dipole and eddies inferred from satellite observations. *Ocean Sciences Meeting, 11<sup>th</sup> – 16<sup>th</sup> February 2018, New Orleans, USA – poster*

**Fournier S.**, Vandemark D., Gaultier L., Jonsson B., Lee T., Gierach M. Interannual variation in offshore advection of Amazon-Orinoco plume waters: observations, forcing mechanisms, and impacts. *AGU Fall Meeting, 11<sup>th</sup> – 15<sup>th</sup> December 2017, New Orleans, LA, USA – oral presentation.*

**Fournier S.**, Reager J.T., Dzwonkowski B., Vazquez-Cuervo, J., SMAP observations to trace the lifecycle of hydrologic extreme events from land to ocean. *SUSMAP Science Team meeting, 19<sup>th</sup> – 20<sup>th</sup> October 2017, Cambridge, MA, USA – oral presentation.*

**Fournier S.**, Vialard J., Lengaigne M., Lee T., Gierach M. Modulation of the Ganges-Brahmaputra river plume by the Indian Ocean Dipole and eddies inferred from satellite observations. *Ocean Surface Topography Science Team Meeting, 23<sup>rd</sup> – 27<sup>th</sup> October 2017, Miami, FL, USA – oral presentation.*

**Fournier S.**, Vialard J., Lengaigne M., Lee T., Gierach M. Modulation of the Ganges-Brahmaputra river plume by the Indian Ocean Dipole and eddies inferred from satellite observations. *Indian Ocean Science Workshop, 11<sup>th</sup> – 13<sup>th</sup> September 2017, La Jolla, USA – poster.*

**Fournier S.**, Vialard J., Lengaigne M., Lee T., Gierach M. Modulation of the Ganges-Brahmaputra river plume by the Indian Ocean Dipole and eddies inferred from satellite observations. *Global Ocean Salinity and the Water Cycle Workshop, 22<sup>nd</sup> – 26<sup>th</sup> May 2017, Woods Hole, USA – oral presentation.*

**Fournier S.**, Vandemark D., Gaultier L., Jonsson B., Lee T., Gierach M. Interannual variation in offshore advection of Amazon-Orinoco plume waters: observations, forcing mechanisms, and impacts. *Global Ocean Salinity and the Water Cycle Workshop, 22<sup>nd</sup> – 26<sup>th</sup> May 2017, Woods Hole, USA - poster.*

**Fournier, S.**, Reager, J. T., Lee, T., Vazquez-Cuervo, J., David, C. H., & Gierach, M. M. SMAP observes flooding from land to sea: The Texas event of 2015. *EGU, 24<sup>th</sup> – 28<sup>th</sup> April 2017, Vienna, Austria – oral presentation.*

**Fournier, S.**, Reager, J. T., Lee, T., Vazquez-Cuervo, J., David, C. H., & Gierach, M. M. SMAP observes flooding from land to sea: The Texas event of 2015. *AGU Fall Meeting, 12<sup>th</sup> – 16<sup>th</sup> December 2016, San Francisco, USA – oral presentation.*

**Fournier S.**, Lee T., Gierach M., Seasonal and interannual variations of sea surface salinity associated with the Mississippi River plume observed by SMOS and Aquarius. *ESA Living Planet Symposium, 8<sup>th</sup> – 13<sup>th</sup> May 2016, Prague, Czech Republic – poster.*

**Fournier S.**, Gaultier L., Vandemark D., Lee T., Salisbury J., Monitoring the Amazon plume northwestward transport along Lagrangian pathways. *EGU, 17<sup>th</sup> – 22<sup>nd</sup> April 2016, Vienna, Austria – oral presentation.*

**Fournier S.**, Gaultier L., Vandemark D., Salisbury J., Lee T., Gierach M., Monitoring the biophysical properties along Lagrangian advection pathways in the Amazon River plume. *Ocean Sciences Meeting, 22<sup>nd</sup> – 26<sup>th</sup> February 2016, New Orleans, USA – poster.*

**Fournier S.**, Gaultier L., Vandemark D., Salisbury J., Lee T., Gierach M., Monitoring the biophysical properties along Lagrangian advection pathways in the Amazon River plume. *AGU, 14<sup>th</sup> – 18<sup>th</sup> December 2015, San Francisco, USA – oral presentation.*

**Fournier S.**, Lee T., Gierach M., Monitoring and understanding seasonal and interannual variations of sea surface salinity associated with the Mississippi River plume. *Aquarius Science Team Meeting, 17<sup>th</sup> – 19<sup>th</sup> November 2015, Buenos Aires, Argentina – oral presentation.*

**Fournier S.**, Gaultier L., Vandemark D., Salisbury J., Lee T., Gierach M., Monitoring the biophysical properties along Lagrangian advection pathways in the Amazon River plume. *Open Science Conference: Salinity and Freshwater Changes in the Ocean, 12<sup>th</sup> – 15<sup>th</sup> October 2015, Hamburg, Germany – oral presentation.*

**Fournier S.**, Lee T., Gierach M., Monitoring and understanding seasonal and interannual variations of sea surface salinity associated with the Mississippi River plume. *Open Science Conference: Salinity and Freshwater Changes in the Ocean, 12<sup>th</sup> – 15<sup>th</sup> October 2015, Hamburg, Germany – poster.*

**Fournier S.**, Reul N., Chapron B., Salisbury J., Vandemark D., Large tropical river plume monitoring with SMOS to better estimate land-sea freshwater fluxes. *ESA-EGU-SOLAS, Air-Sea Gas Flux Climatology, Progress and Future Prospect, 24<sup>th</sup> – 27<sup>th</sup> September 2013, Ifremer, Brest, France – oral presentation.*

**Fournier S.**, Reul N. Spatio-temporal coherence between spaceborne measurements of Salinity and Light Absorption in the Amazon plume region. *ESA Living Planet Symposium, 9<sup>th</sup> – 13<sup>th</sup> September 2013, Edinburgh, Scotland – poster.*

**Fournier S.**, Reul N. Spatio-temporal coherence between spaceborne measurements of Salinity and Light Absorption in the Amazon plume region. *India EU Workshop on Marine Primary Production, 12<sup>th</sup> -15<sup>th</sup> March 2013, Kochi, India – oral presentation.*

**Fournier S.**, Reul N., Charpon B., Tenerelli J. Spatio-temporal coherence between spaceborne measurements of Salinity and Light Absorption in the Amazon plume region. *ESA-SOLAS, Earth Observation for Ocean Atmosphere Interaction Science, 29<sup>th</sup> November-2<sup>nd</sup> December 2011, ESRIN, Frascati, Italy. ESA Special Publication 703, 10 – oral presentation.*

## **FIELD EXPERIENCE**

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- 2022** NASA Arctic field campaign Salinity And Stratification at the Sea Ice Edge (SASSIE) – airborne component
- 2008** Canadian Coast Guard ship Matthew – CTD acquisitions, bathymetric acquisitions, tide gages settling, GPS acquisitions, Newfoundland and Labrador, Canada

## **SKILLS**

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- Languages** French (native), English (fluent), Spanish (basic level)
- Computer** Windows, Linux / Unix, Mac OS, Python, Matlab, Scilab, LaTeX, Microsoft Office, Open Office