# Maxime M. Grand, Ph.D.

Moss Landing Marine Laboratories
8272 Moss Landing Road
Moss Landing, CA, 95039
Web: https://www.mlml.calstate.edu/chemoce/
Phone: (831)-771-4447; Email: maxime.grand@sjsu.edu

Google Scholar | Research Gate | Frontiers Loop Profile | Publons | ORCID | SCOPUS

## RESEARCH INTERESTS

- Biogeochemical cycling of trace metals and nutrients and implications for marine productivity and phytoplankton species composition in coastal and open-ocean systems.
- Development and validation of *in situ* microfluidic chemical analyzers (nutrients, trace metals) for ocean observatories.
- Environmental benefits and impacts of seaweed aquaculture (emissions of short-lived brominated compounds, nutrient removal)

## EDUCATION

**Ph.D. Oceanography (Advisor: Prof. Chris Measures)** **2014**
University of Hawai'i at Mānoa, United States.

**M.S Applied Marine Science (Advisor: Prof. Maeve Lohan)** **2006**
University of Plymouth, United Kingdom.

**Postgraduate Diploma of Science in Environmental Science** **2005**
University of Auckland, New Zealand

**B.S Global Environmental Science (Advisor: Prof. Eric Gaidos)** **2003**
University of Hawai'i at Mānoa, United States.

## PROFESSIONAL APPOINTMENTS

**Assistant Professor,** Moss Landing Marine Labs, San José State University 2018-present
**Adjunct Instructor**, Bridgewater State University 2018
**Postdoctoral Researcher**, University of Hawai'i at Mānoa 2017
**Postdoctoral Research Fellow**, University of Southampton, UK 2015-2017
**Postdoctoral Researcher**, University of Hawai'i at Mānoa 2014
**Graduate Research Assistant**, University of Hawai'i at Mānoa 2007-2014
**Research Assistant**, University of Hawai'i at Mānoa 2003-2004

## RESEARCH GRANTS

**M.M Grand (Lead PI)**, L. Gardner (Co-PI), Quantifying volatile bromocarbon emissions from seaweed aquaculture in California. California Sea Grant New Faculty Award/CSU COAST (R/SFA-07. 02/01/21 - 01/31/22. $89,168 w/$29,723 COAST matching funds)

**M.M Grand (Lead PI)**, M. Hatta (Co-PI), J. Ruzicka (Co-PI) and C.I. Measures(Co-PI). Collaborative Research: Developing Automated Nutrient and Trace Metal Methodology using Programmable Flow Injection. National Science Foundation - Chemical Oceanography OCE-1924539. 09/01/19 - 08/01/22. $467,624.

T. Connolly (Lead PI), J. Harvey (Co-PI), G. J. Smith (Co-PI) and **M.M. Grand (Co-PI)**. CeNCOOS Partnership: Long-Term Monitoring of Environmental Conditions in Support of Marine Area Management in Central and Northern California – U.S. Integrated Ocean Observing System, sub-contract with Monterey Bay Aquarium Research Institute, (06/01/16-05/31/21, $169,720

F. Kazemifar (lead-PI), C. Han (co-PI), H.Wang (co-PI) and **M.M Grand (co-PI)**. Development of a prototype autonomous nutrient analyzer for ocean observing observatories. SJSU CoE IBM Public Impacts Endowment Fund ($29,959, 7/1/21-6/30/22)

T. Connolly (Lead PI), J. Harvey (Co-PI), H. Bowers (Co-PI) and **M.M. Grand (Co-PI)**. CeNCOOS Partnership: Information Solutions to Power Healthy and Prosperous Oceanic, Coastal and Estuarine Communities – U.S. Integrated Ocean Observing System, sub-contract with Monterey Bay Aquarium Research Institute ($54,875, 7/1/21-6/30/22)

## TEACHING EXPERIENCE

**Co-Instructor. Ocean Instrumentation (MS 202 - 4 units), Moss Landing Marine Labs, Spring 2022.** Designed new lectures and laboratory activities on chemical sensors and best laboratory practices to validate chemical sensor data.

**Lead Instructor. Advanced Topics in Oceanography: Analytical Chemical Oceanography and Chemometrics (MS 274 - 3 units), Moss Landing Marine Labs, Spring 2021.** Developed course content and syllabus, including laboratory practicals. A graduate level laboratory intensive course dedicated to foundational statistical methods of relevance to analytical chemistry so students can extract as much information from their analytical results as they legitimately can.

**Lead Instructor. Graduate Seminar: Marine Pollution: Science, Policy and Public Perception (MS 285 - 2 units), Moss Landing Marine Labs, Fall 2020, 2021.** Developed syllabus, prepared lectures, and organized in-class discussions of scientific research articles on various topics in Marine Pollution, with guest lectures from leading scientists in the field (n=4-6).

**Lead Instructor. Chemical Oceanography (MS 143 - 4 units), Moss Landing Marine Labs, Spring 2019-2020-2021-2022.** Major course update in 2019-2020 including syllabus revisions, lectures, in-class activities, problem sets, exams as well as field and laboratory activities. MS143 is an upper undergraduate level course and core course for MLML's MS program.

**Lead Instructor. Marine Pollution (MS 253 - 4 units). Moss Landing Marine Labs, Fall 2019 (4 units).** Developed syllabus, prepared lectures, in-class activities and assignments on various aspects of aquatic chemistry and marine pollution. Designed field and laboratory activities centered around the theme of metal contamination in Elkhorn Slough and Moss Landing Harbor. MS274 is a graduate level course (advanced topics in oceanography).

**Lead Instructor Oceanography (GEOL 210 - 3 credits). Bridgewater State University, Spring 2018.** Prepared and taught 25 introductory oceanography lectures to 21 students, highlighting the primary geological, chemical, physical and biological processes that operate in the ocean and how they collectively interact to influence marine ecosystems and the planet's climate. Undergraduate course.

**Mauka to Makai Oceanography. University of Hawai'i, USA**
Developed a six-weeks summer introductory oceanography course for Native Hawaiian community college students. Led the development of a hands-on curriculum combining fundamental oceanography concepts with field activities (cruises, watershed water quality surveys), laboratory tutorials and service learning activities with community partners.

## STUDENT MENTORSHIP (Primary Advisor)

Erick Partida - MS Marine Science, Chemical Oceanography Lab, MLML. 2019 - present
Marine Lebrec - MS Marine Science, Chemical Oceanography Lab, MLML. 2020 - present
Jessica Metter - MS Marine Science, Chemical Oceanography Lab, MLML. 2020 - present

## PEER REVIEWED PUBLICATIONS

1. Webb, A.L. K.A. Hugues, **M.M. Grand**, M.C. Lohan and L.S. Peck (2020). Sources of elevated heavy metal concentrations in sediments and benthic invertebrates of the western Antarctic Peninsula. *Science of the Total Environment,* doi:10.1016/j.scitoenv.2019.134268

2. **Grand, M.M.**, A. Laes-Huon, S. Fietz, J.A. Resing, H. Obata, G.W. Luther III, A. Tagliabue, E.P., Achterberg, Middag, R., A. Tovar-Sanchez and A.R. Bowie (2019). Developing autonomous observing systems for micronutrient trace metals. *Frontiers in Marine Science,* doi: 10.3389/fmars.2019.00035

3. Barrett, P.M., J.A. Resing, **M.M. Grand**., C.I. Measures, and W. M. Landing (2018). Trace element composition of suspended particulate matter along three meridional sections in the Indian and Southern Oceans: Impact of scavenging on Al distributions. *Chemical Geology*, doi:10.1016/j.chemgeo.2018.06.015

4. Clinton-Bailey, G.T, **M.M. Grand,** A.G. Beaton, A. Nightingale, G. Slavik, M. Mowlem and D.P. Connelly (2017). A lab-on-chip analyzer for in situ measurement of soluble reactive phosphate: improved phosphate blue assay and application to fluvial monitoring. Environmental Science and Technology, doi: 10.1021/acs.est.7b01581

5. **Grand, M.M.,** G.T. Clinton-Bailey, A.D. Beaton, A.M. Schaap, T.H. Johengen, M. Tamburri, D.P. Connelly, M.C. Mowlem and E.A. Achterberg (2017). A Lab-On-Chip Phosphate Analyzer for Long-Term in Situ Monitoring at Fixed Observatories: Optimization and Performance Evaluation in Estuarine and Oligotrophic Coastal Waters. *Frontiers in Marine Science,* doi: 10.3389/fmars.2017.00255

6. Hatta, M., C.I. Measures, P.J. Lam, D.C. Ohnemus, M.E. Auro, **M.M. Grand** and K.E. Selph (2017). The relative roles of Modified Circumpolar Deep Water and benthic sources in supplying Fe to the recurrent phytoplankton blooms above Pennell and Mawson Banks, Ross Sea, Antarctica. *Journal of Marine Systems*, 166: 61-72. doi:10.1016/j/jmarsys.2016.07.009

7. **Grand, M.M.,** P. Chocholous, J. Ruzicka, P. Solich and C.I. Measures (2016). Determination of trace Zn in seawater by coupling solid phase extraction and fluorescence detection in the Lab-On-Valve format. *Analytica Chimica Acta*, 923: 45-54. doi: 10.1016/j.aca.2016.03.056

8. **Grand, M.M,** C.I. Measures, M. Hatta, P.L. Morton, P.M. Barrett, A. Milne, J.A. Resing and W.M. Landing (2015). The impact of circulation and dust deposition in controlling the distributions of dissolved Fe and Al in the South Indian subtropical gyre. *Marine Chemistry,* 176: 110-125 doi: 10.1016/j.marchem.2015.08.002

9. **Grand, M.M,** C. I. Measures, M. Hatta, W.T. Hiscock, C.S. Buck and W. M. Landing (2015). Dust deposition in the eastern Indian Ocean: the ocean perspective from Antarctica to the Bay of Bengal. *Global Biogeochemical Cycles*, 29, doi:10.1002/2014GB004898

10. **Grand, M.M,** C.I. Measures, M.Hatta, W.T. Hiscock, W.M. Landing, P.L. Morton, C.S. Buck, P.M. Barret and J.A. Resing (2015). Dissolved Fe and Al in the upper 1000m of the eastern Indian Ocean: high-resolution data from the Antarctic margin to the Bay of Bengal. *Global Biogeochemical Cycles*, 29, doi:10.1002/2014GB004920

11. Oliveira, H.M., **M.M. Grand**, J.Ruzicka and C.I. Measures (2015). Towards chemiluminescence detection in micro-sequential injection lab-on-valve format: A proof of concept based on the reaction between Fe(II) and luminol in seawater. *Talanta*, 133: 107-111. doi: 10.1016/j.talanta.2014.06.076

12. Guannel, M.L., B. Bruno, **M.M. Grand**, N.Lee and E.A. Day-Miller (2014). In Hawaii, a pilot course in professional development fulfills an unmet need in graduate education. *Limnology and Oceanography Bulletin,* 23(3) 56-59. doi:10.1002/lob.201423356

13. **Grand, M.M,** C. Buck, W. Landing, C. Measures, M. Hatta, W. Hiscock, M. Brown, and J. Resing (2014), Quantifying the Impact of Atmospheric Deposition on the

Biogeochemistry of Fe and Al in the Upper Ocean: A Decade of Collaboration with the US CLIVAR-$CO_2$ Repeat Hydrography Program, *Oceanography*, *27*(1), 62–65. doi: 10.5670/oceanog.2014.08

14. Measures, C.I., M. Hatta, and **M.M Grand** (2012). Bioactive trace metal distributions and biogeochemical controls in the Southern Ocean. *Oceanography,* 25: 122–133. doi: 10.5670/oceanog.2012.85

15. **Grand, M.M,** H.M. Oliveira, J. Ruzicka and C.I. Measures (2011). Determination of dissolved zinc in seawater using micro-Sequential Injection lab-on-valve with fluorescence detection. *Analyst,* 136: 2747-2755. doi: 10.1039/c1an15033b

16. **Grand, M.M** and E.J Gaidos (2010). Methane emission from a tropical wetland in Kaʻau Crater, Oahu, Hawaiʻi. *Pacific Science*, 64: 57-72. doi: 10.2984/64.1.057

## OTHER PUBLICATIONS

Fassbender, A.J., H.I. Palevsky, T.R. Mertz, A.E. Ingalls, M. Gledhill, S.E. Fawcett, J.A. Brandes, L.I. Aluwihare, the participants of COME ABOARD, DISCO XXV (2017). Perspectives on Chemical Oceanography in the 21st century: Participants of the COME ABOARD Meeting examine aspects of the field in the context of 40 years of DISCO. *Marine Chemistry,* 20: 181-190. doi: 10.1016/j.marchem.2017.09.002

COCA Working Group (2014). The Collaborative on Oceanography and Chemical Analysis (COCA) and suggestions for future instrumental analysis methods in Oceanography. Report from the Collaborative on Oceanography and Chemical Analysis (COCA) meeting held at the Department of Oceanography University of Hawaii, March 26-29, 2013.
Published as a Virtual Special Issue in *Marine Chemistry*.

## AWARDS & SCHOLARSHIPS

**2018** Frontiers in Marine Science Community Support Fund ($1,000)
**2017** Nutrient Sensor Challenge. "Honorable Mention for Innovation and Potential".
**2013** J. Watumull Merit Scholarship (University of Hawaiʻi, Dept. of Oceanography).
**2011** Antarctic Service Medal (National Science Foundation).
**2003** NOAA Hawaiʻi Sea Grant Fellowship.
**2002** NOAA Hawaiʻi Sea Grant Fellowship for senior thesis research.
**2001** Milred Towle Scholarship for International Students (University of Hawai'i).

## INVITED SEMINAR PRESENTATIONS

**2021. Estuary & Ocean Science Center.** *San Francisco State University*
The development of autonomous chemical analyzers for ocean observatories and aquaculture in California.

**2018. UCSC Ocean Sciences Seminar.** *University of California Santa Cruz*
Beyond GEOTRACES: From basin-scale micronutrient metal survey to in situ microfluidic sensing.

**2018. WHOI MC&G Seminar.** *Woods Hole Oceanographic Institution*
High-resolution sampling in chemical oceanography. From ship-based trace metal surveys in the Indian Ocean to microfluidic sensing.

**2016. Ocean Seminar.** *University of Hawaii, Department of Oceanography*
Biogeochemical sensors in a networked ocean and microfluidic Lab-On-a-Chip sensors for high-sensitivity nutrient measurements.

**2015. BIOS Seminar.** *Bermuda Institute of Ocean Sciences*
Seeking higher resolution in space and time: from shipboard studies to chemical micro sensors.

**2014. DISCO XXIV.** *Dissertation Symposium in Chemical Oceanography (NSF)*
Dissolved Fe and Al cycling in the Indian Ocean: from high-resolution sections to the prospect of miniaturized autonomous determinations.

## CONFERENCE PROCEEDINGS

Metter, J., **M.M. Grand** and L. Gardner (2022). Methane reduction or ozone depletion? Estimating the environmental impact of growing large quantities of bromocarbon rich seaweeds for cattle consumption. *2022 Ocean Science Meeting, Virtual (Talk).*

Lebrec, M., M. Hatta and **M.M. Grand** (2022). Automated nutrient analysis via programmable flow injection: from benchtop to unattended operation at shore stations. *2022 Ocean Science Meeting, Virtual (Talk).*

Partida, E., and **M.M. Grand** (2022). A novel method for the analysis of nanomolar and sub-nanomolar aluminuin in coastal and estuarine waters using programmable flow injection. *2022 Ocean Science Meeting, Virtual (Talk).*

Guidry, M., R. Alegado, M.A. McManus, A.C. Castillo-Trujillo, H.H. Kane, M. Hatta, V. Sindorf, K.M Mayfield and **M.M. Grand** (2020). A place-based, oceanography summer bridge program as part of an academician curricular pathway from 2YCs to 4YC for Native Hawaiian and other underrepresented students in the geosciences. *2020 Ocean Sciences Meeting, San Diego (Talk).*

Hatta, M., **M.M. Grand**, C.I. Measures and J. Ruzicka. From autoanalyzer to chemical sensor: the future of biogeochemical monitoring (2019). *Ocean Obs' 19 Meeting, Honolulu.*

**Grand, M.M.,** V. Sindorf, M.A. McManus and M. Guidry (2018). Mauka to Makai Oceanography: Bridging Native Hawaiian Cultural Heritage With State-of-The-Art

Geoscientific Practice to Foster Native Hawaiian Student Interest in Geoscience Degrees. *2018 Ocean Sciences Meeting* (Talk).

**Grand, M.M.,** G.T. Turner, A. Beaton, E. Achterberg, and M.C. Mowlem, (2016). In situ determinations of phosphate in estuarine and coastal waters using a high-sentivity Lab-On-Chip sensor. *Challenger Society 2016 Conference*, Liverpool, UK (Talk).

**Grand, M.M.,** G.T. Turner, M.C. Mowlem, E. Achterberg, A.D. Beaton, D. Owsianka, G. Slavik, A. Nightingale and D.P Connelly (2016). Development of a high-sensitivity Lab-On-Chip sensor for *in situ* determinations of phosphate in coastal and open ocean environments. *2016 Ocean Sciences Meeting*, New Orleans, USA (Talk).

**Grand, M.M,** C.I. Measures, M. Hatta, W.M. Landing, P.L. Morton and W.T. Hiscock. (2014). Biogeochemistry of dissolved Fe and Al in the eastern Indian Ocean: Insights from the Antarctic margin to the Bay of Bengal along 95°E. *2014 Ocean Sciences Meeting,* Honolulu, Hawaii, USA. (Talk).

Hatta, M., C.I. Measures, P.J. Lam, D.C Ohnemus, **M.M Grand** and K.E. Selph (2014). The dissolved Fe, Mn and Al concentrations on the shelf/slope in the Ross Sea during the 2011 SEAFARERS expedition. *2014 Ocean Sciences Meeting,* Honolulu, Hawaii, USA.

Guannel, M.L., B.C Bruno, **M.M. Grand**, N. Lee, and E.A Day-Miller (2014). Fostering leadership and appreciation for broader impacts among early career scientists: development and assessment of a professional development course. *2014 Ocean Sciences Meeting,* Honolulu, Hawaii, USA.

**Grand, M.M,** C.I. Measures, M. Hatta, W.M. Landing, P.L. Morton and W.T. Hiscock (2013). Dissolved Fe and Al from Antarctica to the Bay of Bengal: Insights from the CLIVARI8S and I9N Repeat Hydrography Cruises. 2013 *Gordon Research Conference, Chemical Geography of the Sea,* University of New England, Biddeford, ME. (Poster).

Morton, P., W.M. Landing, C.I. Measures, C.S. Buck, K.J. Gosnell, **M.M. Grand**, M. Hatta and W.T. Hiscock (2013). Dissolved Cd, Co, Cu, Ni, Mn and Pb along the CLIVAR I8S/I9N Indian Ocean transects. ASLO 2013 Aquatic Sciences Meeting, New Orleans, USA.

**Grand, M.M**, J. Ruzicka and C.I. Measures (2012). Pre-concentration strategies for the fluorometric determination of trace metals in seawater using Bead Injection μSI-LOV: Application to dissolved Zn. Flow Analysis XII, Thessaloniki, Greece. (Talk).

**Grand, M.M,** J. Ruzicka, H.M. Oliveira and C.I. Measures (2012). An innovative method for the determination of trace zinc in seawater using micro-Sequential Injection and a novel fluorescent probe. 2012 Ocean Sciences Meeting, Salt Lake City, USA. (Poster).

Measures, C.I., **M.M. Grand**, H.M. Oliveira, W.M. Landing and B. Kilgore (2012). Distribution of dissolved trace elements in the upper 1000m of the South Pacific during the CLIVAR S4P Cruise. 2012 Ocean Sciences Meeting, Salt Lake City, USA.

**Grand, M.M**, J. Ruzicka, H.M. Oliveira and C.I. Measures (2011). Trace metal analysis using micro-Sequential Injection lab-on-valve with fluorometric detection: Fundamentals and

application to chemical oceanography. Abstract O-4. 17th International Conference on Flow Injection Analysis, Krakow, Poland. (Talk).

**Grand, M.M**, H.M. Oliveira, J. Ruzicka and C.I. Measures (2010). A novel approach to trace analysis of zinc in sea water using micro sequential injection with fluorescence detection. Abstract OP19. XIV International Symposium on Luminescence Spectroscopy, Prague, Czech Republic. (Talk).

**Grand, M.M**, C.I. Measures, M. Hatta, W.M. Landing and K. Gosnell (2010). Dissolved Iron and Aluminium along 32°S across the South Indian Ocean Subtropical Gyre: Results from the CLIVAR I5 Repeat Hydrography Expedition. Abstract CO25A-O6. Ocean Sciences Meeting, Portland, USA. (Poster).

Measures, C.I., W. M. Landing, C. S. Buck, M.T. Brown, W. T. Hiscock, **M.M Grand**, M. Hatta and K. J. Gosnell (2010). Dust Deposition to the Surface Waters of the Global Ocean. Abstract CO25A-19. Ocean Sciences Meeting, Portland, USA.

Landing, W.M., A. Milne, K. J. Gosnell, C. I. Measures, M. Hatta and **M.M. Grand** (2010). Dissolved trace element data from the US GEOTRACES Atlantic and Pacific intercalibration cruises. Abstract CO21A-03. Ocean Sciences Meeting, Portland, USA.

Hatta, M., C. I. Measures, **M.M. Grand**, K.E. Selph and W.M Landing (2010). Dissolved Iron and Aluminium Distributions in the Western South Pacific Ocean During CLIVAR-CO2 Repeat Hydrography P06 Transect. Abstract CO25A-O7. Ocean Sciences Meeting, Portland, USA.

Gosnell, K.J., W. M. Landing, C. I. Measures, M. Hatta and **M.M. Grand** (2010). Biogeochemistry of dissolved zinc in the southern Indian Ocean: results from the 2009 CLIVAR I5 transect. Abstract CO25A-O8. Ocean Sciences Meeting, Portland, USA.

**Grand, M.M**, C.I. Measures, W.M. Landing, W.T. Hiscock, C.S. Buck, M. Hatta and K. Gosnell (2008). High resolution dissolved Fe and Al along 95E in the South Indian Ocean: Results from the CLIVAR I8S Repeat Hydrography Section. Eos Trans. AGU, 89(53), Fall Meet. Suppl., Abstract OS23D-1281. AGU Fall Meeting, San Francisco, USA. (Poster).

Measures, C.I., W.M. Landing, C. Buck, M.T. Brown, W.M. Hiscock, **M.M. Grand**, M. Hatta and K. Gosnell, 2008. Global patterns of dust deposition deduced from dissolved Al in the surface ocean. 18th V.M. Goldschmidt Conference. Vancouver, Canada.

**Grand, M.M.,** and E.J. Gaidos, 2004. Connecting Regional Change to Global Greenhouse Gas Budgets: Seasonality, Vegetation Change and Methane Emission of a Hawaiian Tropical Wetland. *Eos. Trans.* AGU, 85 (28). West. Pac. Geophys. Meet. Suppl., Abstract B13A-04. Western Pacific Geophysics Meeting, Honolulu, USA

**Grand, M.M.,** and E.J. Gaidos, 2003. Rainfall, Plant Communities and Methane Fluxes from the Kaʻau Crater Wetland, Oahu, Hawaiʻi. *Eos Trans.* AGU, 84 (46). Fall Meet. Suppl., Abstract B41C-0906. AGU Fall Meeting, San Francisco, USA. (Poster).

## SEAGOING EXPERIENCE

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| **2018** | MOANA-MATY I | R/V Alis | 26 days |
| **2016** | SenseOCEAN | R/V Littorina, Baltic Sea | 05 days |
| **2016** | SenseOCEAN | R/V Plymouth Quest, English Channel. | 02 days |
| **2012** | PANDORA. | N/O L'Atalante, Solomon Sea. | 37 days |
| **2011** | CLIVAR S04P. | R/V Palmer, Southern Ocean. | 54 days |
| **2011** | SEAFARERs. | R/V Palmer, Ross Sea. | 30 days |
| **2010** | CLIVAR P06. | R/V Melville, South Pacific. | 42 days |
| **2009** | CLIVAR I05. | R/V Revelle, Indian Ocean. | 57 days |
| **2008** | US GEOTRACES. | R/V Knorr, Atlantic Ocean. | 20 days |
| **2008** | CLIVAR I06S. | R/V Revelle, Indian Ocean. | 45 days |
| **2007** | CLIVAR I08S. | R/V Revelle, Indian Ocean. | 45 days |

## PROFESSIONAL SERVICE

- **Manuscript Reviewer:** Frontiers in Marine Biogeochemistry, Analytica Chimica Acta, Analytical Methods, Limnology and Oceanography Methods, ACS Sensors, Geochimica et Cosmochimica Acta, Marine Chemistry, Journal in Oceanography, Trends in Analytical Chemistry, Global Biogeochemical Cycles.

- **Proposal Reviewer:** NSF-OCE Chemical Oceanography, Czech Science Foundation, CSU Council on Ocean Affairs, Science & technology (COAST)

- **Review Panelist:** National Science Foundation

## UNIVERSITY SERVICE

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| 2021- | Member, MLML Space Committee |
| 2020- | Member, SJSU College of Science Curriculum Committee |
| 2020- | Chair, MLML Curriculum Committee |
| 2020- | Member, MLML Marine Operations Committee |
| 2020-2021 | Member, SJSU College of Science Research Committee |
| 2019-2020 | Member, MLML Biological Oceanography Search Committee |

## WORKSHOPS AND SYNERGISTIC ACTIVITIES

2019 American Chemical Society New Faculty Workshop, Savannah, Georgia, USA
2013 Collaborative on Oceanographic Chemical Analysis, Honolulu, Hawaii, USA

## PROFESSIONAL MEMBERSHIPS

Association for the Sciences of Limnology and Oceanography (ASLO)