Dr. Sarah-Jeanne Royer

International Pacific Research Center (IPRC)
University of Hawaii
1680 East West Road
Honolulu, HI 96822
sjroyer@hawaii.edu

Education

2017-present	**Post-doctorate in Oceanography** International Pacific Research Center (IPRC) School of Ocean and Earth Science & Technology (SOEST) University of Hawaii, Honolulu, USA. (Supervision by Nikolai Maximenko).
2015-2017	**Post-doctorate in Oceanography** Centre for Microbial Oceanography: Research and Education (C-MORE) School of Ocean and Earth Science & Technology (SOEST) University of Hawaii, Honolulu, USA. (Supervision by David Karl).
2009-2015	**Ph.D. in Marine Sciences (with distinction *Cum Laude*)** Institut de Ciències del Mar (CSIC), Barcelona, Spain. (Supervision by Rafel Simó).
2008-2009	**M.Sc. in International Ecology** Department of Biology, University of Sherbrooke, Sherbrooke, Canada. Department of Oceanography, Universidade Federal de Pernambuco, Recife, Brazil. (Supervision by Caroline Cloutier and Mariana Guenther).
2006-2008	**M.Sc. in Biological Oceanography** Department of Biology, Laval University, Québec, Canada. (Supervision by Maurice Levasseur).
2004-2006	**B.Sc. in Biology** Department of Biology, Laval University, Québec, Canada. Reunion University, Reunion Island, Indian Ocean, France.
2001-2002	**Certificate in International and Intercultural Development** Rivière-du-Loup College, Rivière-du-Loup, Canada & Bamako, Mali
1998-2001	**Technical diploma in Biology** Ste-Foy College, Québec, Canada. Specializations: Marine Biology / Biochemistry.

Relevant projects

2017-present

Plastic research on the modelling of oceanic currents and the study of transportation, trends and drivers of marine debris and microplastics in the ocean.

Participation in weekly fieldwork at James Campbell National Wildlife Refuge to study plastic accumulation on remote beaches in Hawaii.

Communication and outreach, grant writing, experimental work assessing the effect of marine debris on natural environment.

Mentoring students, networking, build and maintain relationships between scientists and different organizations linked to the success of our projects.
Work supervised by Nikolai Maximenko.

2015-2017

Experimental work assessing the emissions of greenhouse gases by virgin and aged plastic from the ocean.

CO2, CO, methane, ethylene, ethane, propylene, and oxygen distributions at station ALOHA.

Sediment trap experiments to study the production of methane and ethylene production from sinking particulate matter at station ALOHA.
Work supervised by David Karl.

Participation in monthly Hawaii Ocean Time-series cruises at station ALOHA.
Work supervised by Matthew Church.
C-MORE (University of Hawaii, Manoa), Honolulu, U.S.A..

2016

Participation in HOE-III legacy SCOPE cruise in the North Pacific Subtropical Gyre.
Work supervised by Ed DeLong and Samuel Wilson.
C-MORE (University of Hawaii, Manoa), Honolulu, U.S.A..

2014-2015

Participation in a two-month atmospheric and oceanographic cruise in Antarctica (B.I.O. Hesperides).
Work supervised by Rafel Simó.
PEGASO: Institut de Ciències del Mar, Barcelona, Spain.

2014

Participation in a six-week atmospheric and oceanographic cruise in the North and South Atlantic Oceans (Spain-Argentina-Chile/Bio-Hesperides).
Chief scientist for the transect Argentina-Chile (B.I.O. Hesperides) and in charge of supervising and teaching M.Sc./Ph.D. students.
Trans-PEGASO: Institut de Ciències del Mar, Barcelona, Spain.

2013

Participation in a six-week cruise in the Arctic (C.C.G.S Amundsen).
In charge of supervising and teaching Ph.D. students.
Work supervised by Maurice Levasseur.
ArcticNet 2013: Université Laval, Québec, Canada.

2012-2013

Laboratory experiment: Effect of iron, pCO_2 and light stress on Southern Ocean phytoplankton species.
Work supervised by Philip Boyd.
University of Otago, Dunedin, New-Zealand.

2011-2012	**Participation in two Mediterranean cruises (B/O García del Cid). Responsible for DMS measurements in continuous (using APCI-MS) and phytoplankton physiological state (using FRRf).** Work supervised by Rafel Simó. SUMMER: Institut de Ciències del Mar, Barcelona, Spain.
2011	**Data analysis and optimization of an APCI-MS.** Work supervised by Eric Saltzman. University of California, Irvine, USA.
2010-2011	**Participation in the seven-month circumnavigation expedition Malaspina 2010 (Bio-Hesperides).** Responsible for discrete (GC-FPD) and continuous (APCI-MS) DMS measurements and phytoplankton physiological state (using FRRf). Work supervised by Rafel Simó. Malaspina: Institut de Ciències del Mar, Barcelona, Spain. **Responsible for iodine/bromine (using MAX-DOAS) and ozone measurements.** Work supervised by Alfonso Saiz-Lopez. Laboratorio de Ciencias de la Atmósfera y el Clima, Toledo, Spain. **Responsible for bioaerosol collection.** Work supervised by Carlos Duarte. IMEDEA (CSIC-UIB), Mallorca, Spain.
2010	**Participation in the six-week HaloCarbon Air Sea Transect-Pacific expedition in the Eastern Pacific (Punta Arenas - Seattle, R/V Thomas Thompson).** Trained on APCI-MS and responsible for iodine/bromine measurements using MAX-DOAS. Work supervised by Shari Lewis. HaloCAST-P: Texas A&M University, USA.
2010	**Participation in a one-month outdoor Mediterranean phosphorous-limited mesocosm experiment (LightDynamMix) (Creta).** Quantification of ROS production and phytoplankton growth following light treatments. Transplant experiments between different light level tanks. Work supervised by Josep Gasol. Hellenic Centre for Marine Research, Creta, Greece.
2009-2012	**Quantification of ROS production by different phytoplankton species according to UVR dose/dosage, spectral exposure and recovery.** Institut de Ciències del Mar, Barcelona, Spain.
2008-2009	**Evaluation of microzooplankton grazing on distinct phytoplankton size classes in a tropical estuary in Brazil.** Responsible for zooplankton identification, enumeration and data analysis. Universidade Federal de Pernambuco, Recife, Brazil.
2007	**Participation in a six-week cruise in the Arctic. Responsible for teaching DMS(P) sampling and radioactive labelling using ^{35}S-DMSP to a Ph.D. student (C.C.G.S. Amundsen).** International Polar Year: Université Laval, Québec, Canada.
2007	**Participation in a two-month cruise in the HNLC region of the North East Subarctic Pacific.** Responsible for DMS(P) sampling and radioactive labelling using ^{35}S-DMSP and sampling iron using the clean metal technique (C.C.G.S. John P.Tully). Line P/La Perouse: Institute of Ocean Sciences, British Columbia, Canada.

2002	**Evaluation of the impact of whale watching and maritime traffic on ecology of marine mammals in Tadoussac.** Research assistant in charge of the field measurements and data analysis. Work supervised by Robert Michaud. GREMM, Tadoussac, Canada.
2001	**Optimization of breeding processes with necropsy and microbiological analysis in Pacific Salmon and Brown Trout populations in Chile.** Patagonia Salmon Farming, Puyuapi, Chile.
2000	**Evaluation of the impact of poaching activities on marine turtle survival in a protected reserve.** Biological sampling, tagging of marine turtles and incubation of marine turtle eggs in protected nursery. Gandoca-Manzanillo National Wildlife Reserve, Costa Rica.

Selected publications

1. **Royer, S.J.**, Galí, M., Mahajan, A.S., Ross, O., Pérez, G., Saltzman, E. and Simó, R. A high-resolution time-depth view of dimethylsulphide cycling in the surface sea, *Scientific Report (Nature),* 6:32325, doi: 10.1038/srep32325, (2016).

2. Mayol, E., Arrieta, J.A., Jimenez, M.A., Martínez-Asensio, A., Garcias-Bonet, N., A., Dachs, J., González-Gaya, B., **Royer, S.J.**, Benítez-Barrios, V., Fraile-Nuez, E. and Duarte, C.M., Airborne microorganisms over the global subtropical ocean, *Nature Communications,* 8:201 doi*: 10.1038/s41467-017-00110-9,* (2017).

3. Ptacnik, R., Gomes, A., **Royer, S.J.**, et al. A light-induced shortcut in the planktonic microbial loop, *Scientific Report (Nature),* 6:29286, doi: 10.1038/srep29286, (2016).

4. Fernández-Castro, B., Mouriño-Carballido, B., Marañón, E., Chouciño, P., Gago, J., Ramírez, T., Vidal, M., Bode, A., Blasco, D., **Royer, S.J**., Estrada and M., Simó, R. Importance of salt fingering for new nitrogen supply in the oligotrophic oceans, *Nature Communications*, 6:8002 (2015).

Refereed journal articles

5. Jung, M.R., Horgen D.F., Orski S.V., Rodriguez C.V., Beers, K.L., Balazs, G.H., Jones, T., Work, T.M., Brignac, K.C., **Royer, S.J.,** Hyrenbach, K.D., Jensen, B.A., Lynch, J.M. Application of ATR FT-IR to identify polymers of plastic marine debris, including those ingested by marine organisms, *Marine Pollution Bulletin*, November 2017.

6. **Royer, S.J**., Mahajan, A.S., Galí, M., Saltzman, E. and Simó, R. Small-scale variability patterns of DMS and phytoplankton in surface waters of the tropical and subtropical Atlantic, Indian and Pacific oceans*, Geophysical Research Letters,* v.12, p.475-483, (2015).

7. **Royer, S.J**., Galí, M., Saltzman E., McCormick, C., Bell, T. and Simó, R. Development and validation of a shipboard system for measuring high-resolution vertical profiles of aqueous dimethylsulfide concentrations using chemical ionization mass spectrometry, *Environmental chemistry,* v.11, p.309-317, (2014).

8. **Royer, S.J**., Levasseur, M., Lizotte M., Arychuk, M., Scarratt, M., Wong, C S., M., Lovejoy, C., Robert, M., Johnson, K., Peña, A., Michaud, S. and Kiene R. Microbial dimethylsulfoniopropionate (DMSP) dynamics along a natural iron gradient in the North East subarctic Pacific, *Limnology and Oceanography*, v.55, p.1614-1626, (2010).

9. Pérez, G.L., Galí, M., **Royer, S.J.,** Sarmento, H., Gasol, J.M., Marrasé, C. and Simó, R. Bio-optical characterization of offshore NW Mediterranean waters: CDOM contribution to absorption budget and diffuse attenuation of downwelling irradiance, *Deep-Sea Research 1,* v. 114, p.111-127, (2016).

10. Mahajan, A.S., Fadnavis, S., Thomas, M. A., Pozzoli, L., Gupta, S., **Royer, S.J.**, Saiz-Lopez, A. and Simó, R. Quantifying the impacts of an updated global dimethylsulfide (DMS) climatology on cloud microphysics and aerosol radiative forcing, *Journal of Geophysical Research: Atmospheres*, doi:10.1002/2014jd022687, (2015).

11. Prados-Roman, C., Cuevas, C.A., Hay, T., Fernandez, R.P., Mahajan, A.S., **Royer, S.J.**, Galí, M., Simó, R., Dachs, J., Großmann, K., Kinnison, D.E., Lamarque, J.F., and Saiz-Lopez, A. Iodine oxide in the global marine boundary layer, *Atmospheric Chemistry and Physics*, v.15, p.583-593, (2015).

12. Galí, M., Devred, E., Levasseur, M., **Royer, S.J**. and Babin, M. A remote sensing diagnostic model for planktonic DMSP and an analysis of global patterns, *Remote Sensing of Environment*, v. 171 p.171 (2015).

13. Guenther, M., **Royer, S.J.**, de Oliveira Campos, D., Neumann-Leitão, S. Spatial variation of the plankton community over a short-term survey at a tropical hypereutrophic estuary, *Arquivos de Ciencias do Mar*, v.48, p.39 (2015).

14. Galí, M., Simó, R., Pérez, G.L., Ruiz-González, C., Sarmento, H., **Royer, S.J.,** Fuentes-Lema, A. and Gasol, J.M. Differential response of planktonic primary, bacterial, and dimethylsulfide production rates to vertically-moving and static incubations in upper mixed-layer summer sea waters, *Biogeosciences*, v.10, p.7983-7998, (2013).

15. Mahajan, A.S., Gómez Martín, J.C., Hay, T., **Royer, S.J.,** Yvon-Lewis, S., Liu, Y., Hu, L., Prados-Roman, C., Ordóñez, C., Plane, J.M.C. and Saiz-Lopez, A. Latitudinal distribution of reactive iodine in the Eastern Pacific: link to open ocean sources, *Atmospheric Chemistry and Physics*, v.12, p.15541-15564, (2012).

16. Luce, M., Levasseur, M., Scarratt, M., Michaud, S., Lovejoy, C. and **Royer, S.J.** Microbial production of DMS in the arctic, *Journal of Geophysical Research*, v.116, p.4-11, (2011).

Articles submitted or in preparation

1. **Royer, S.J.**, Ferron, S., Wilson S., Karl, M.D. Methane and ethylene from plastic in the environment, *under review at PLOS ONE*, April 2018.

2. **Royer, S.J.**, Galí, M., Fuentes-Lema A., Sobrino, C., Levasseur, M. and Simó, R. Short-term effects of solar radiation on phytoplankton photophysiology and dimethylated sulfur production in two contrasting environments (Western Mediterranean Sea and the Arctic Ocean), *In preparation*.

3. **Royer, S.J.**, Mahajan, A.S., Galí, M., Delgado-Huertas, A. and Simó R. Sea surface DMS distribution patterns and environmental drivers across sub and tropical oceans, *In preparation*.

4. **Royer, S.J.**, Gomes, A., Ptacnik, R., Pitta, P. and Gazol, J. Impact of light on reactive oxygen species production during an outdoor mesocosm experiment in phosphorus-limited waters of the eastern Mediterranean Sea, *In preparation*.

5. **Royer, S.J.**, Galí, M., Sarmento H., Gazol, J. and Simó R. Quantification of reactive oxygen species and DMS production of single strain phytoplankton cultures after an induced UVB-stress, *In preparation*.

6. Joli, N., **Royer, S.J.,** Babin, M., Lovejoy, C. Photosynthetic microbial communities and photophysiology in Northern Baffin Bay. *In preparation*.

7. Gourdal, M., **Royer, S.J.**, Levasseur, M.. Dynamics of dimehtylsulfide in the High Canadian Arctic. *In preparation.*

8. Brignac, K.C., Jung, M.R., King, C., Currie, J., Lamson, M.R., Blickley, L., O'Brien, K., **Royer, S-J.**, Potemra, J.T., Lynch, J.M.. Polymer Identification of Plastic Marine Debris on Beaches and the Sea Surface in the Hawaiian Archipelago by FT-IR to Determine Sources. To Be Submitted to *Marine Pollution Bulletin*.

Selected presentations

Royer, S.J., Ferrón, S., Wilson, S.T., Karl, D.M. (2018). Production of hydrocarbon gases from plastic at ambient temperatures. Talk at 6th International Marine Debris Conference, San Diego, U.S.A..

Royer, S.J., Flores, M., Ziemann, K., Pacarro, K. (2018). Bridging community work and academia. Invited poster at 6th International Marine Debris Conference, San Diego, U.S.A..

Brignac, K.C., Jung, M.R., King, C., Currie, J., Lamson, M.R., Blickley, L., O'Brien, K., **Royer, S-J.**, Potemra, J.T., Lynch, J.M. Polymer Identification of Plastic Marine Debris on Beaches and the Sea Surface in the Hawaiian Archipelago by FT-IR to Determine Sources. Invited poster at 6th International Marine Debris Conference, San Diego, U.S.A..

Flores, M., **Royer, S.J.,** Pacarro, K. (2018). Clean beaches start at home. Invited poster at 6th International Marine Debris Conference, San Diego, U.S.A..

Royer, S.J., Hafner, J., Maximenko, N.. (2018). **Bridging citizen science and academia.**
Talk at the Asia Oceania Geosciences Society. Honolulu, U.S.A..

Brignac, K.C., Jung, M.R., King, C., Currie, J., Lamson, M.R., Blickley, L., O'Brien, K., **Royer, S-J.**, Potemra, J.T., Lynch, J.M.. (2018). Polymer Identification of Plastic Marine Debris on Beaches and the Sea Surface in the Hawaiian Archipelago by FT-IR to Determine Sources. Invited poster at the Asia Oceania Geosciences Society. Honolulu, U.S.A..

Cortes, P., Simo, R., Rodriguez-Ros, p., Nunes, S., Zamanillo, M., **Royer, S-J.**, Ortega-Retuerta, E., Montserrat Sala, M., Pérez, g., Estrada, M., Catala, T., Álvarez-Salgado, X.A., Gávalas-Olea, A., Garrido, J.L.. Comparative distribution of Volatile Organic Compounds across the surface oceans. Ocean Sciences, Portland, Oregon, U.S.A..

Royer, S.J., Vila, M., Berdalet, E. (2017). Plastic marine pollution as a physical support to spread harmful algae. Invited talk at International Workshop on Marine Pollution and Maritime Safety, Barcelona, Spain.

Simó R., Cortes., P., Zamanillo, M., Rodrigues-Ros, P., **Royer, S.J.,** et al., (2017). Exploring ocean-atmosphere exchanges in the Southern Ocean: the PEGASO and ACE projects. Microbes Conference, Banyuls, France.

Royer, S.J., Ferron, S., Wilson S., del Valle, D., Sosa, O., Karl, M.D. (2017). Methane production from sinking particulate matter at station aloha. Invited presentation at American Society of Limnology and Oceanography (ASLO) Honolulu, Hawai'i.

Royer, S.J., Galí, M., Saltzman, E., Mahajan, A.S., Simó, R. (2014). Sea surface DMS distribution patterns and environmental drivers across the tropical and subtropical oceans. Invited presentation at 6th International DMSP Symposium, Barcelona, Spain.

Cuevas, C., **Royer, S.J.,** et al., (2014). Ship-based DOAS measurements of OVOCs during the Malaspina 2010-2011 expedition. Poster at European Geosciences Union General (EGU), Vienna, Austria.

Royer, S.J., Galí, M., Saltzman, E., Mahajan, A.S., Simó, R. (2014). Large and small scale patterns of DMS variability in the surface ocean. Invited presentation at Workshop on Malaspina 2010, Cádiz, Spain.

Royer, S.J., Galí, M., Saltzman, E., Mahajan, A.S., Simó, R. (2013). Large and small scale patterns of DMS variability in the surface ocean. Invited presentation at Malaspina Conference, Canary Island, Spain.

Royer, S.J., Galí, M., Saltzman, E., Mahajan, A.S., Simó, R. (2013). Large and small scale patterns of DMS variability in the surface ocean. Invited presentation at Microbes Conference, Banyuls, France.

Royer, S.J., Galí, M., Saltzman, E., Mahajan, A.S., Simó, R. (2012). Large and small scale patterns of DMS variability in the surface ocean. Invited presentation at American Society of Limnology and Oceanography (ASLO) Osaka, Japan.

Royer, S.J., Galí, M., Saltzman, E., Mahajan, A.S., Simó, R. (2012). High resolution, lagrangian vertical profiles of dimethylsulfide reveal short-term response to environmental forcing. SOLAS OSC, Washington State, U.S.A.

Gomez-Martin, J. C., Hay, T.D., Mahajan, A.S., Prados-Roman, C., Ordoñez, C., **Royer, S.J.,** Yvon-Lewis, S., Agama-Reyes, M.V., Paredes-Mora, J.F., Sorribas- Panero, M., Gil, M., MacDonald, S., Plane, J.M.C. and Saiz-Lopez, A. (2012). On the latitudinal and seasonal distribution of reactive halogens in the Eastern Pacific marine boundary layer. Invited talk at European Geosciences Union General (EGU), Vienna, Austria.

Participated in the annual Malaspina Conference (2014), Barcelona, Spain.

Participated in the 5th International DMSP Symposium (2010), Goa, India.

Participated in the American Geophysical Union (2011), San Francisco, U.S.A.

Participated in the organization of the SOLAS Ocean Science Conference (2009), Barcelona, Spain.

Levasseur, M., **Royer, S.J**. (2009). DMS microbial dynamics along a natural iron gradient in the North East Subarctic Pacific. Invited presentation at American Society of Limnology and Oceanography (ASLO) winter meeting in Nice, France.

Levasseur, M., **Royer, S.J**. (2008). DMS microbial dynamics along a natural iron gradient in the North East Subarctic Pacific. Invited presentation at Advances in Marine Ecosystem Modelling Research (AMEMR), Plymouth, UK.

Levasseur, M., **Royer, S.J**. (2008). Microbial dynamic of DMSP/DMS along an iron gradient in the North East Subarctic Pacific. Invited presentation at American Society of Limnology and Oceanography (ASLO) summer meeting in St-John's, Newfoundland, Canada.

Royer, S.J. (2008). Microbial dynamic of DMSP/DMS along an iron gradient in the North East Subarctic Pacific. Invited talk at the annual general assembly of Québec-Océan, Riv.-du-Loup, Canada.

Royer, S.J. (2007). Microbial dynamic of DMSP/DMS along an iron gradient in the North East Subarctic Pacific. Poster presentation at the annual general assembly of Québec-Océan, Rivière-du-Loup, Canada.

Royer, S.J. (2007). Microbial dynamic of DMSP/DMS along an iron gradient in the North East Subarctic Pacific. Talk and poster presentation at SOLAS Summer School in Corsica, France.

Thesis and Reports

Royer, S.J. (2015). **Links between dimethylated sulfur and phytoplankton photophysiology in the surface ocean: geographic patterns and short-term variability.** Ph.D. thesis, University of Barcelona, Spain.

Royer, S.J. (2009). **Microbial dynamic of DMSP/DMS along an iron gradient in the North East Subarctic Pacific.** Master thesis, Laval University, Canada.

Royer, S.J. (2008). **Spatial variation of the plankton community over a short-term survey at a tropical hyper-eutrophic estuary, Recife, Brazil.** Master thesis, Sherbrooke University, Canada and Universidade de Pernambuco, Recife, Brazil.

Royer, S.J. (2002). **Assessment of agroforestry productivity during the dry season of Sinzana.** Report submitted to Sotuba Research Center, Mali & Rivière-du-Loup College, Canada.

Royer, S.J. (2001). **Microbial contamination in Pacific Salmon and Brown Trout populations in Puyuapi, Chile.** Report submitted to Ste-Foy College, Canada.
Royer, S.J. (2001). **Climate change & polar bears.** Report submitted to St-Foy College, Canada.

Honours

- Awarded "Cum Laude" PhD title 2015.
- Awarded a four-year "Formación Personal Investigador (FPI)" scholarship, Consejo Superior de Investigaciones Científicas (CSIC), Spanish Government, (2009-2013).
- Awarded a six-month "Estancias Breves (EEBB)" scholarship for collaboration work at Université Laval, Canada, CISC, Spanish Government, (2013).
- Awarded a six-month EEBB scholarship for collaboration work at University of Otago, New-Zealand, CISC, Spanish Government, (2012).
- Awarded a six-month EEBB scholarship for collaboration work at University of California (Irvine), U.S.A., CSIC, Spanish Government, (2011).
- Awarded a "Bourse pour de courts séjours à l'extérieur du Québec (BCSE)" scholarship for a one-year master project in Recife, Brazil, Ministère de l'Éducation, du Loisir et du Sport (MELS), Government of Québec, (2009).
- Awarded a scholarship to attend the SOLAS Summer School (2007).
- Awarded a OFQJ scholarship for a six-month stay in Reunion Island, France, Government of Quebec (2004).
- Awarded a FATCD scholarship for a six-month project in Mali, Government of Canada (2002).
- Awarded a OQAJ scholarship for a five-month project in Chile, Government of Quebec (2001).

Training certificates and relevant skills

Proficient at using micro-Raman RXN spectroscopy system and Fourier Transform Infrared spectrometry (FT-IR) for polymer identification.

Proficient at setting up and running a Membrane Inlet Mass Spectrometer (MIMS) for measuring oxygen argon ratio.

Proficient at using the Winkler technique for measuring oxygen levels in sea water.

Proficient at using and analyzing pCO_2 LI-COR data in continuous and discrete measurements in air and sea water.

Proficient at setting up and running an Atmospheric Pressure Chemical Ionisation Mass Spectrometer (APCI-MS) for measuring concentrations of atmospherically and oceanographically relevant chemical species (DMS, Isoprene).

Proficient at running a Multi-AXis DOAS (MAX-DOAS) for constructing atmospheric vertical profiles of relevant atmospherically trace gases.

Proficient at running a scanning mobility particle size spectrometer and an ozone monitor.

Proficient at measuring phytoplankton physiological state using Fast Repetition Rate fluorometry (FRRf) and ECO triplet optical sensor instrument.

Proficient at using a Flow Cytometer to count and identify bacteria and phytoplankton groups, measure fluorescence and certain chemical species, such as H_20_2.

Proficient at measuring concentrations of atmospherically and oceanographically relevant chemical species using Gas Chromatography flame ionization detector (GC-FID) and GC-Mass Spectrometry (GC-MS).

Proficient at sampling oceanic iron species (dissolved and total iron) with clean metal technique.

Proficient at using radiolabeled isotope to measure bacterial activity.

Proficient at using molecular techniques (Mar-Card-FISH) for identification and enumeration of bacterial DMSP assimilation.
Proficient at identifying and counting bacteria, phytoplankton cells and zooplankton organisms.

Proficient at computer programming (Matlab), using statistical, graphing, and Microsoft software (SAS, Sigma Plot, Excel, Word and Power Point).

Certified trainee in handling and transportation of radioactive and dangerous goods.

Scuba diving certificate (ACUC International) and certified first aider.

Languages

English / French / Spanish / Portuguese/ Catalan/ Hindi

Volunteer/Additional activities

2017 - Present	**Coral spawning at the Hawai'i Institute of Marine Biology.**
2017 - Present	**Field work with O'ahu Invasive Species.**
2016 - Present	**Scientific diver for Ocean Defenders, Hawaii.**
2015 - Present	**Scientific liaison and educator for Sustainable Coastlines Hawaii.**
1996 - 2009	**National Defense and the Canadian Armed Forces.** Work in the **Public Relations** section as a photographer and journalist in Canada and for short missions in the US. Analyst in war-caused conflict for Psychological Operations, Canada. TV section analyst, ISAF, **Kabul, Afghanistan (2004).** Analyst for a women's project, NATO, **Kandahar, Afghanistan (2008).**
2004 - 2009	Physical education trainer at University Laval and various fitness centers.
2001 - 2002	Voluntary Services Overseas in Sotuba Research Center, **Mali, Africa.**
1999	Teaching assistant in chemistry, Sainte-Foy College, Ste-Foy, Canada.

References

Nikolai Maximenko
International Pacific Research Center (IPRC)
University of Hawaii
1680 East-West Road
Honolulu, HI 96822
Phone: +1-808-956-2584
Email: maximenk@hawaii.edu

David Karl
Director of Centre for Microbial Oceanography: Research and Education (C-MORE)
University of Hawaii, Manoa
1950 East-West Rd.
Honolulu, Hawaii 96822
Phone: +1-808-956-8964
Email: dkarl@hawaii.edu

Kahi Pacarro
Executive Director of Sustainable Coastlines Hawaii
3409 Sierra Dr.
Honolulu, Hawaii 96816
Phone: +1-808-221-7678
Email: kahi@sustainablecoastlineshawaii.org

Rafel Simó
Institut de Ciències del Mar, CSIC
Marine Biology and Oceanography
Barcelona, Spain, 08003
Phone: +34-932-309-590
Email: rsimo@icm.csic.es

Maurice Levasseur
Université Laval
Ocean Biogeochemistry and Climate
Québec, Canada G1V 0A6
Phone: +1-418-656-3207
Email: maurice.levasseur@bio.ulaval.ca

Eric S. Saltzman
National Science Foundation/Section Head Arctic Sciences
University of California, Irvine/Earth System Science
Phone: +1-703-292-8029 (NSF)
Phone: +1-949-824-3936 (UCI)
Email: esaltzma@nsf.gov
Email: esaltzma@uci.edu

Alfonso Saiz-Lopez
Instituto de Química Física Rocasolano, CSIC
Atmospheric Chemistry and Climate Group
Madrid, Spain 28006
Phone: +91-7452500 (Ext. 950613)
Email: a.saiz@csic.es