



# Itzel Ruvalcaba Baroni

---

## Curriculum Vitae

*"The limits of the possible can only be defined by going beyond them into the impossible" - Arthur C. Clarke*

### Areas of Expertise

Biogeochemistry, modeling (HAMOCC2.1, box models), carbon cycle, ocean circulation modeling (FOAM, MITgcm, box models), oceanography and paleoceanography

### Education

from 04/2018 **Postdoc in aquatic biogeochemistry modelling**, *Department of Environmental Science and Analytical Chemistry (ACES), Stockholm University, Sweden.*

Project title *Potential hot-spots for release of greenhouse gases in Arctic catchment systems*

Advisor Associate prof. dr. Christian Beer

from 01/2015 **Postdoc in marine biogeochemistry and paleoceanography as part of the Netherlands Earth Science System Center (NESSC)**, *Department of Earth Sciences, Utrecht University, Netherlands.*

Project title *Nutrient cycling and ocean circulation during greenhouse periods*

Advisor prof. dr. Caroline Slomp

from 11/2009 **Ph.D in marine biogeochemistry and paleoceanography**, *Department of Earth Sciences, Utrecht University, Netherlands.*

Thesis title *Biogeochemical response to widespread anoxia in the past ocean*

Advisors prof. dr. Caroline Slomp & prof. dr. Jack Middelburg

from 08/2007 **Master in physical oceanography**, *Geophysical Institute, University of Bergen, Norway.*  
to 06/2009

Thesis title *Internal waves and mixing in Sognefjorden*

Advisor prof. Ilker Fer

from 02/2000 **Bachelor in oceanology-geological oceanography**, *Faculty of Marine Sciences, University of Baja California, Mexico.*  
to 06/2005

Thesis title *Paleoecology of benthic foraminifera from the Pleistocene in The Faro, Baja California, Mexico*

Supervisors Professor Miguel A. Téllez Duarte

**Dissertation with honors**

---

08/2016 to **Maternity leave.**  
12/2016

---

## Experience

General achievements:

- Vast experience in ocean and biogeochemical modeling
- Detailed knowledge of the phosphorus, nitrogen, oxygen and carbon cycles in marine systems
- Extensive experience in working abroad
- Good experience in laboratory work
- Effective in working independently and in collaboration
- Active in teaching at bachelor, master and PhD level as assistant and lecturer (Paleoceanography, Geochemical processes and cycles, Introduction to Biogeochemical cycles, Field research instruction geochemistry)
- Lectured at R and L<sup>A</sup>T<sub>E</sub>X workshops
- Co-organized workshops for PhD students
- Involved as staff-support at symposiums and workshops
- Involved as a member of the Netherlands Earth System Science Center (NESSC) work board for the NESSC PhD and Postdoc network

Selected specific achievements:

2017 **Research visit**, GEOPHYSICAL INSTITUTE, UNIVERSITY OF BERGEN, Norway.  
I worked one week with prof. dr. Christoph Heinze on a joint biogeochemical modeling project with the Hamburg Oceanic Carbon Cycle model for long-term simulations (HAMOCC2.1).

- 2016 **Research visit**, CENTRE EUROPÉEN DE RECHERCHE ET D'ENSEIGNEMENT DE GÉOSCIENCES DE L'ENVIRONNEMENT (CEREGE), France.  
I worked 3 weeks with prof. dr. Yannick Donnadiou on a joint ocean circulation modeling with the Fast Ocean-atmosphere Model (FOAM).
- 2016 **Research visit**, SWEDISH METEOROLOGICAL AND HYDROLOGICAL INSTITUTE (SMHI), Sweden.  
I went for a short visit to the SMHI, where I worked with dr. Elin Almroth Rosell and dr. Moa Edman in order to learn how to use the Swedish Coastal zone Model (SCM). I also presented my project on nutrient cycling under low-oxygen conditions during past greenhouse periods.
- 2016 **Invited Referee**, UNIVERSITY OF UTRECHT, The Netherlands.  
I reviewed the manuscript of Auger et al. accepted for publication in Biogeosciences.
- 2015 **Invited lecturer for a 6 hour course on R computing language**, UNIVERSITY OF LEIDEN, The Netherlands.  
I planned and gave a lecture to PhD students to teach them how to plot scientific data and create their own maps with R.
- 2015 **Co-organizer and lecturer at the NESSC R-workshop**, UNIVERSITY OF UTRECHT, The Netherlands.  
I co-organized a 3 day course on R computing language for PhD's and Postdocs as part of the Netherlands Earth System Science Centre (NESSC), where I also gave a lecture on how to plot scientific data and create maps with R.
- 2012 **IODP Core Repository**, UNIVERSITY OF BREMEN, Germany.  
We sampled several sediment cores at the Integrated Ocean Drilling Project (IODP) Core Repository in Bremen in order to collect data of phosphorous, nitrogen isotopes and organic carbon in deep anoxic sediments during the mid-Cretaceous. These data were used to better understand the nutrient cycling and redox conditions in the deep proto-North Atlantic.
- 2008 **Oceanographic cruise**, GEOPHYSICAL INSTITUTE, UNIVERSITY OF BERGEN, Norway.  
A 2 week student cruise to the Sognefjord, where I collected data for my master investigation using CTD and current meters. Directed by prof. dr. Tor Gammelsrød.
- 2005 **Paleontological reference collection of Baja California, invertebrates section**, UNIVERSIDAD AUTÓNOMA DE BAJA CALIFORNIA, Mexico.  
I collaborated for a year in this project, where I: 1) searched for fossils and microfossils to detect paleocurrents and compared the ancient biota to the current one; 2) analyzed foraminifera in the laboratory as well as carried out laboratory maintenance. Rated "Excellent". Directed by Dr. Miguel Téllez Duarte.
- 2005 **Data processing with meteorological and oceanographic equipment**, INSTITUTO DE INVESTIGACIÓN OCEANOGRÁFICA (IIO), Mexico.  
I participated in this project to help install Oceanographic Instruments (Acoustic Doppler Current Profilers and wave gages) in coastal environments through diving. Directed by M.Sc. Rafael Blanco Betancourt.

---

## Awards and selected presentations

- 2016 Poster presentation at the International Conference on Paleoceanography, Utrecht, the Netherlands: **I. Ruvalcaba Baroni**, Niels A.G.M. van Helmond, Angela L. Coe, Anthony S. Cohen, Yannick Donnadiou and Caroline P. Slomp, *Reconstructing the biogeochemistry of the European epicontinental shelf sea during the Toarcian Oceanic Anoxic Event*.
- 2016 **Invited speaker** at the marine sciences symposium, Utrecht, The Netherlands: **I. Ruvalcaba Baroni**, N. A. G. M. van Helmond, I. Tsandev, J. B. M. Middelburg and C. P. Slomp, *The impact of ocean anoxia on marine nitrogen cycling*.
- 2014 **Best poster award** at the Darwin/NESSC meeting, Noordwijkerhout, the Netherlands: **I. Ruvalcaba Baroni**, N. A. G. M. van Helmond, I. Tsandev, J. B. M. Middelburg and C. P. Slomp, *Reassessing the nitrogen isotope composition of sediments from the proto-North Atlantic during Oceanic Anoxic Event 2*.
- 2013 Poster Presentation at the American Geophysical Union (AGU), San Francisco, USA: **I. Ruvalcaba Baroni**, I. Tsandev and C. P. Slomp, *Nitrogen dynamics during the Cenomanian-Turonian Oceanic Anoxic Event 2: A model study for the proto-North Atlantic*.
- 2013 Poster Presentation at the European Geosciences Union General Assembly (EGU), Vienna, Austria: **I. Ruvalcaba Baroni**, N. A. G. M. Van Helmond, R. P. M. Topper, H. Brinkhuis and C. P. Slomp, *Was the North Atlantic Ocean well-ventilated during Oceanic Anoxic Event 2 in the mid-Cretaceous?*
- 2012 **Invited speaker** at the Integrated Ocean Drilling Program Symposium, Utrecht, Netherlands: **I. Ruvalcaba Baroni**, N. A. G. M. Van Helmond, R. P. M. Topper, H. Brinkhuis and C. P. Slomp, *Was the North Atlantic Ocean well-ventilated during Oceanic Anoxic Event 2 in the mid-Cretaceous?*
- 2011 Poster presentation at the European Geosciences Union General Assembly (EGU), Viena, Austria: **I. Ruvalcaba Baroni** and C. P. Slomp, *Modeling Marine Phosphorus and Nitrogen cycles in the Cretaceous: What triggered ocean anoxia?*
- 2011 Poster presentation and staff-support at the Climate and Ocean Dynamics of the Cretaceous Greenhouse World Symposium, Utrecht, Netherlands: **I. Ruvalcaba Baroni** and C. P. Slomp, *Modeling Marine Phosphorus and Nitrogen cycles in the Cretaceous: What triggered ocean anoxia?*
- 2007 **CONACYT award**, scholarship for Mexican professionals who wish to undertake postgraduate studies abroad in a highly recognized institution.
- 2007 Oral presentation at the State Meeting of Education and Water Culture, University of Sonora, Mexico: **I. Ruvalcaba Baroni** and C. H. Murphy, *Deterioration of the river Tancochín*.
- 2005 **Best oral presentation award** at the XIII Oceanographic Student Congress, University of Baja California (UABC), Ensenada, Mexico: **I. Ruvalcaba Baroni**, *Paleoecology of benthic foraminifera from the Pleistocene in El Faro, Baja California, Mexico*.

---

## Additional courses

- 2015 **Mathematical approaches to (palaeo-) climate sensitivity**, UTRECHT UNIVERSITY, The Netherlands.  
A 2 days workshop on (palaeo-) climate sensitivity focussing on new mathematical approaches as part of the NESSC.
- 2011 **Darwin summer school on Biogeosciences**, UTRECHT UNIVERSITY AND NIOZ, The Netherlands.  
A 2 week course that focused on global carbon perturbations in the past, present and future. Our group obtained the **best oral presentation award**.
- 2010 **Urbino summer school in paleoclimatology**, URBINO UNIVERSITY, Italy.  
A 3 week course that focused on Past Global Change Reconstruction and Modelling Techniques. A talk and poster presentation was mandatory.
- 2010 **Introductory course in marine science part II: Biochemical Oceanography and Climates**, ALFRED-WEGENER INSTITUTE (AWI), Bremerhaven, Germany.  
A one week course that focused on important issues and new knowledge of modern marine biogeochemistry and its influence on the climate.

---

## Other Achievements

- 2016 **Geological field trip to Yorkshire**, UNIVERSITY OF UTRECHT, The Netherlands.  
I was invited to participate in a 3 day fieldwork to sample several Jurassic outcrops in order to collect sediment data of mainly phosphorous, nitrogen isotopes and organic carbon in shallow anoxic sediments during the Toarcian Oceanic Anoxic Event.
- 2007 **Supervisor in geology**, 3GEO (PROFESSIONAL SERVICES FOR GEOLOGY, GEOPHYSICS AND GEOTECNIA), Mexico.  
For 3 months, I worked as a geologist supervising the excavation of wells and describing their stratigraphy. Rated “excellent”. Directed by Jorge E. Díaz García.
- 2006 **Field work to survey the hydrology of a tropical river**, CIEASAS, Mexico.  
I organized and conducted a 4 week-field work in a tropical region of Mexico (La Huasteca) to study the change in hydrology of the river Tancochin and its implication for the local communities.
- 2006 **Oceanographic cruise**, ALGALITA MARINE RESEARCH FOUNDATION, Mexico.  
A 2 week cruise, where I participated in watch duty and water sampling with a Manta Trawl to detect and quantify anthropogenic debris along the Pacific Coast of Baja California.

## ■ Nationality

Mexican and Swiss

## ■ Languages

Mothertongue **Spanish and French**

Intermediate **English**

*Professional working proficiency*

Basic **Dutch**

*Basic understanding and conversation*

Basic **Norwegian**

*Basic words and phrases*

## ■ Computer skills

Basic Microsoft Windows, OpenOffice, Adobe Illustrator

Intermediate L<sup>A</sup>T<sub>E</sub>X, Linux

Advance Matlab, R, Fortran, Ferret

## ■ Key Interests

- Carbon turnovers
- Nutrient cycles
- Arctic changes
- Climate change
- Ocean and lake dynamics
- Extreme climate events

Itzel Ruvalcaba Baroni, Department of Earth Sciences  
Utrecht University, 3584 CC Utrecht, The Netherlands

+31 30 253 5037

I.RuvalcabaBaroni@uu.nl

[www.uu.nl/staff/IRuvalcaba/0](http://www.uu.nl/staff/IRuvalcaba/0)

## Publications

### FIRST AUTHOR

- **Ruvalcaba Baroni, I.**, van Helmond, N. A. G. M., Tsandev, I., Middelburg, J. and C. P. Slomp: The nitrogen isotope composition of sediments from the proto-North Atlantic during Oceanic Anoxic Event 2, *Paleoceanography*, 30, doi:10.1002/2014PA002744, 2015.
- **Ruvalcaba Baroni, I.**, Tsandev, I. and Slomp C. P.: Nitrogen dynamics during the Cenomanian-Turonian oceanic Anoxic Event 2: A model study for the proto-North Atlantic, *Geochemistry, Geophysics, Geosystems*, 15(10), 4064-4078, 2014
- **Ruvalcaba Baroni, I.**, Topper, R. P. M., van Helmond, N. A. G. M., Brinkhuis, H. and Slomp, C. P.: Biogeochemistry of the North Atlantic during oceanic anoxic event 2: role of changes in ocean circulation and phosphorus input, *Biogeosciences*, 11, 977–993, 2014.
- **Ruvalcaba Baroni, I.** and Murphy. C. H.: La triste historia del Río Tancochín y su deterioro hidrológico, in: Ruvalcaba Mercado J., La tercera realidad: La Huasteca como espejo cultural, CIESAS, 231–247, 2013.

### OTHERS

- von der Heydt, A. S., Dijkstra, Hendrik, van de Wal, R. S. W., Caballero, R., Crucifix, M., Foster, G. L., Huber, M., KÅhler, P., Rohling, E. J., Valdes, P. J., Ashwin, P., Bathiany, S., Berends, Tijn, van Bree, Loes, Ditlevsen, P., Ghil, M., Haywood, A., Katzav, J., Lohmann, G., Lohmann, J., Lucarini, V., Marzocchi, Alice, PÅdlike, H., **Ruvalcaba Baroni, I.**, Simon, D., Sluijs, A., Stap, L. B., Tantet, A., Viebahn, J. and Ziegler, M.: Lessons on climate sensitivity from past climate changes, *Current Climate Change Reports* 2.4, 148–158, 2016.
- van Helmond, Niels A. G. M., **Ruvalcaba Baroni, I.**, Sluijs, A., Sinninghe Damsté, J. S., and Slomp, C. P.: Spatial extent and degree of oxygen depletion in the deep proto-North Atlantic basin during Oceanic Anoxic Event 2, *Geochemistry, Geophysics, Geosystems* 15(11), 4254-4266, 2014.