Christian Schwarz

Email: mag.christian.schwarz@gmail.com
cell: +31 630 585651

Date of birth: 15.09.1981
Nationality: Austrian
Current residence: Utrecht, the Netherlands

Experience

Assistant Professor **Bio-geomorphology of Coastal Barrier Systems** 2016 - current

Utrecht University, Department of Physical Geography

- Self-directed and independently managing projects, workload and teaching
- Conceived and implemented field and lab experiments
- Proficient with a variety techniques for sedimentologic, ecologic and hydrodynamic water assessments and modelling
- Supervision of Bachelor, Master and PhD students
- Coordination and teaching of 2 MSc and 2 BSc courses
    - MSc course "Estuarine/Coastal Ecology" Coordinator and Lecturer
    - MSc course "MSc excursion physical geography (Germany-Netherlands)" Coordinator and Lecturer
    - BSc course "e-modules System Earth 2" Coordinator
    - BSc course "honours System Earth 2" Coordinator and Lecturer
    - In the process of acquiring the basic Dutch university teaching certificate (BKO)

Post-doctoral research **Spatial ecology and Geomorphology** 2014 – 2016

University of Antwerp, Ecosystem Management Group

Project: "Numerical modeling of hydro- and morphodynamics of intertidal flats"

- Self-directed and independently managed project and workload
- Coordinated annual work plan and field work
- Reported results and contributed to stakeholder meetings
- Proficient with a variety techniques for ecologic and hydrodynamic water assessments
- Supervision of Master and PhD students
- Teaching assistant for field course "Alpine ecology"
- Teaching assistant for field course Estuarine Ecology

Academic degrees

PhD. **Spatial ecology and Geomorphology** 2013
Radboud University Nijmegen, the Netherlands (finishing date: March 2014)
Royal Netherlands Institute for Sea Research (NIOZ)
Title: "Implications of biogeomorphic feedbacks on tidal landscape development"

MSc. **Aquatic Ecology** 2008
University of Vienna, Austria
Title: "Resource stoichiometry and the growth rate hypothesis in *Verrucomicrobium spinosum*"

BSc. **Environmental Biology specialization** 2007
University of Vienna, Austria

BSc. **Chinese Studies** 2006
University of Vienna, Austria

Grants and Awards

MASTS Numerical Hydrodynamics Modelling Forum Small Grant 2000£ 2016

Future Delta Seed Money	15 000 €	2016
East China Normal University Best Paper Award	700 €	2015

Academic Supervision

PhD students:

Veerle Verschoren, co-supervised, University of Antwerp	completed 2017
Rebecca van Coppenrolle, co-supervised, University of Antwerp	2014- ongoing
Muriel Brückner, Utrecht University	2016- ongoing

Masters students

Marije Hogen, morphologic development of the Schelt Estuary, University Antwerp	2015-2016
Inger bij de Vate, Salt mash channel dynamics, Utrecht University	2017- ongoing
Corinne Böhm, vegetation foredune dynamics, Utrecht University	2017- ongoing
Niels van Kuik, remote sensing vegetation dynamics, Utrecht University	2018- ongoing
Floirs van Rees, experimental channel dynamics, Utrecht University	2018- ongoing
Andy Bruijns, remote sensing of coastal interventions, Utrecht University	2018- ongoing
Remco Belonje, waves in intertidal systems, Utrecht University	2018- ongoing

Bachelor students

Lenneke Ruissen, primary supervisor, Utrecht University	2016
Kim Hoven primary supervisor, Utrecht University	2017

Guided Research Students

Sebastian Fauque, primary supervisor, Utrecht University	2017
Emmi Sommer, primary supervisor, Utrecht University	2017

Training and Foreign visits

- **Scientific exchange investigating plant-flow interactions, University of Glasgow** **2017**
- **Joint field campaign with University of Antwerp** **November** **2017**
- **Doctoral research** 2009 - 2013
  Radboud University Nijmegen, stationed at the Royal Netherlands Institute for Sea Research (NIOZ), partnering with East China Normal University, Shanghai (2-4 month research visit every year)
  - Self-directed and independently managed project and workload
  - Coordinated annual work plan and field work in China
  - Proficient with a variety techniques for hydrodynamic water assessments
  - Carried out remote field work for sample collection and measurements
  - Designed field and laboratory experiments to test research hypothesis
- **Internship** 2009
  Animal Production Unit of the IAEA (International Atomic Energy Agency), conducted microbiological analysis for the livestock-breeding program
- **Research assistant** 2008 - 2009
  Microbial Diversity and Ecosystem Functioning project in the Department of Freshwater Ecology at the University of Vienna responsibilities included nucleic acid quantification and experimental design
- **Teaching assistant** 2008
  Taught the undergraduate course 'Diversity and taxonomy of higher plants' at the University of Vienna
- **Research assistant** 2008
  Identified and quantified lipids for the project: "Resource Limitation of microbial Decomposition in Soil Organic Matter" in the Department of Chemical Ecology and Ecosystem Science at the University of Vienna.
- **Language studies** 2004-2005
  Study exchange year (joint study program, Beijing Language University, 北京语言大学)

Languages

German (mother tongue), English (fluent), Dutch (fluent), Chinese (proficient)

Publications

Bibliometric data (Google Scholar, Feb 2018): 72 citations, h-index= 4, i10-index= 4

Peer-reviewed scientific articles

10. **Schwarz**, C. et al. (2018), Schwarz, Christian, et al. "Self-organization of a biogeomorphic landscape controlled by plant life-history traits." *Nature Geoscience* (2018): 1.

9. Van Coppenolle, R., **Schwarz,** C., Temmerman, S. (2018), Contribution of mangroves and salt marshes to nature-based mitigation of coastal flood risks in major deltas of the world. Estuaries and Coasts, *Accepted.* .

8. **Schwarz,** C., Cox, T., van Engeland, T., van Oevelen, D., van Belzen, J., van de Koppel, J., Soetaert, K., Bouma, Tjeerd J., Meire, P. & Temmerman, S. (2017), Field estimates of floc dynamics and settling velocities in a tidal creek with significant along-channel gradients in velocity and SPM. *Estuarine, Coastal and Shelf Science, 197*, (pp. 221-235) (15 p.).

7. **Schwarz,** C., Ysebaert, T., Vandenbruwaene, W., Temmerman, S., Zhang, L.Q. and Herman P.M.J. (2016), Impacts of plant species invasion on bio-geomorphologic landscape formation. *Earth Surface Processes and Landforms*

6. **Schwarz**, C., Bouma, T.J., Zhang, L.Q., Temmerman, S.,Ysebaert, T., Herman, P.M.J. (2015), Interactions between plant traits and sediment characteristics influencing species establishment and scale dependent feedbacks in salt marsh ecosystems. *Geomorphology*

5. Vandenbruwaene, W., **Schwarz,** C., Bouma, T., Meire, P., Temmerman, S. (2015), Landscape-scale flow patterns over a vegetated tidal marsh and an unvegetated tidal flat: implications for the landform properties of the intertidal floodplain. *Geomorphology***.**

4. **Schwarz**, C., Ye,Q.H., Van der Wal, D., Zhang, L.Q., Bouma, T.J., Ysebaert, T. and Herman, P.M.J. (2014), Impacts of salt marsh plants on tidal channel inititation and inheritance, *Journal of Geophysical Research Earth Surface*.

3. **Schwarz**, C., Ysebaert T., Zhu, Z.C., Zhang, L.Q., Bouma, T.J. and Herman, P.M.J. (2011), Abiotic Factors Governing the Establishment and Expansion of Two Salt Marsh Plants in the Yangtze Estuary, China, *Wetlands*, *31*(6), 1011-1021.

2. Zhu, Z.C., Zhang, L.Q., Wang, N, **Schwarz**, C. and Ysebaert T. (2011), Interactions between the range expansion of saltmarsh vegetation and hydrodynamic regimes in the Yangtze Estuary, China, *Estuarine, Coastal and Shelf Science.*

1. Hall, E. K., Singer, G. A., Pölzl, M., Hämmerle, I., **Schwarz, C**., Daims, H., ... & Battin, T. J. (2011). Looking inside the box: using Raman microspectroscopy to deconstruct microbial biomass stoichiometry one cell at a time. *The ISME journal*, 5(2), 196.

Peer- Reviewed for: Advances in Water Resources, ESPL, Geomorphology, Journal of Coastal Conservation, Journal of Geophysical Research: Oceans and Earth Surface, Marine Ecology Progress Series (MEPS), Nature Communications, American Naturalist

Contributions at national and international scientific conferences and workshops

Ruessink, …**Schwarz** et al. 2018, Long-term observations of airflow patterns in a man-made coastal trough blowout. (poster at EGU, Vienna, Austria)
Brückner, …**Schwarz** et al. 2018, Effects of biological traits on saltmarsh species distribution and estuarine bar morphology. (presentation at EGU, Vienna, Austria)
Schwarz et al. 2018, Implications of bio-flocculation on fine estuarine particle transport. (poster at EGU, Vienna, Austria)
Brückner, …**Schwarz** et al. 2018, Effects of biological traits on salt marsh species distribution and estuarine bar Morphology (presentation, NCK days 2018)
Schwarz et al. 2017, Impacts of salt marsh plants on tidal channel initiation and inheritance. (oral presentation at Coastal Ecology workshop, Wemeldinge, the Netherland)
Gourgue, … **Schwarz**, et al. 2017, Multiscale challenges in bio-geomorphic modeling of tidal marshes (presentation, 10th Symposium on River, Coastal and Estuarine Morphodynamics, RCEM 2017, Italy)
Schwarz et al. 2017, How plant life-history traits are steering bio-geomorphologic landscape formation; (poster at EGU, Vienna, Austria)
Schwarz et al. 2017, I Are plant life-history strategies able to shape bio-geomorphologic interactions?. (at NCK days, The Netherlands)
vanCoppenolle, **Schwarz**, Temmerman. 2016. Tidal wetlands as ecosystem-based adaptation to coastal flood risks. (ECSA, Bremen, Germany)
Schwarz et al. 2016, Field estimates of settling velocities in a tidal creek: Limiting assumptions and applications. (ECSA, Bremen, Germany)
Claude, …**Schwarz**, et al. 2015. Numerical simulation of flow around vegetation with Telemac2D: application on laboratory experiments on the Isére river, France. (22nd TELEMAC-MASCARET User Conference, France.)
Verschoren, **Schwarz**, et al. 2015. Implementing plant growth of flexible aquatic vegetation into a hydrodynamic model (Telemac2D). (22nd TELEMAC-MASCARET User Conference, France.)
Schwarz et al. 2015, Challenges in forecasting the long-term biogeomorphologic development of intertidal wetlands: A case study in the Scheldt estuary. (oral presentation at ECSA, London, United Kingdom)
Schwarz et al. 2013, Impacts of salt marsh plants on tidal channel initiation and inheritance. (oral presentation at EGU, Vienna, Austria)
Schwarz et al. 2013, Impacts of small scale processes on large scale salt marsh dynamics. (oral talk at NIOZ Yerseke, The Netherlands)
Schwarz et al. 2013, Vegetation impacts on geomorphologic feedbacks: A study on tidal channel emergence. (oral presentation at NCK days, Kijkduin, The Netherlands)
Schwarz et al. 2012, Influences of vegetation and sediment type on tidal channel initiation: Consequences for estuarine landscape development. (oral presentation at ASLO, Lake Biwa, Japan)
Schwarz et al. 2012, Vegetation characteristics influencing geomorphologic feedbacks: A study on tidal channel emergence. (oral presentation at Delft3D User Meeting, Deltares, Delft, The Netherlands)
Schwarz et al. 2011, On the potential of salt marsh plants shaping tidal landscapes. (oral lunch talk at Deltares Delft, The Netherlands)
Schwarz et al. 2011, Implications of vegetation and sediment type on channel development: A First Step. (oral presentation at coastal ecology workshop, University of Antwerp, Belgium)

Media attention

Press releases:
Utrecht University:
https://www.uu.nl/nieuws/dominante-rol-planten-bij-landschapsvorming-kustgebieden

Royal Netherlands Institute for Sea Research:
https://www.nioz.nl/en/news/nieuw-inzicht-in-de-dominante-rol-van-planten-bij-landschapsvorming-in-kustgebieden

University of Antwerp:
https://www.uantwerpen.be/en/news/Plants play dominant role in landscape formation of coastal areas

News articles:

- https://www.helpdeskwater.nl/actueel/@199775/nieuw-inzicht/ (website of the Dutch government, including a link on Twitter and retweets by @waterindestad, @LeidenZeezijde)
- https://www.myscience.org/news/2018/plants_play_dominant_role_in_landscape_formation_of_coastal_areas-2018-uantwerpen (Swiss internet portal for science and innovation, international target group)
- https://www.oozo.nl/nieuws/hulst/kloosterzande/walsoorden/754959/nieuw-inzicht-in-de-dominante-rol-van-planten-bij-landschapsvorming-in (Dutch Newssite)
- https://www.groeneruimte.nl/nieuws/artikel.html?id=204824 (online distributer or agricultural and ecologic news; also shared on twitter by @groeneruimte)
- http://worlduninews.shafaqna.com/EN/US/391912 (RSS reader)
- https://www.nature.com/articles/s41561-018-0193-6 introducing nature article

Technical Skills

- Delft3D
  (a process based hydrodynamic and sediment transport model developed by TU Delft)
- TELEMAC
  (a process based hydrodynamic and sediment transport model developed by EDF, BAW and HR Wallingford)
- MATLAB,
- R
- FORTRAN (basic knowledge)
- ArcGIS
- Setup, measurement and data analysis of hydrodynamic factors
  (e.g. waves: pressure sensor; currents: ADCP, ADV)
- MS Office
- Adobe Illustrator
- SPSS
- Sigma Plot
- FISH (fluorescence in situ hybridization)
- Fluorescence microscopy
- Nucleic acid quantification
- Amino acid quantification,
- Bacterial cultivation