SeaLevel Newsletter

Issue 6 | October 2019

www.spp-sealevel.de

Welcome to the SPP-1889 SeaLevel Newsletter!

We are pleased to release our autumn issue which falls into a new, bridging period between the 2 phases of the SPP SeaLevel program. The research of the first phase progressively comes to completion and the recently-granted projects of the second phase begin. A warm welcome to all new members of the SPP SeaLevel community!

This issue introduces the projects involved in the new phase of the program and presents a description of the fresh, innovative work of two brand-new projects. TRANSEAC, by joining economics and mathematical modelling, aims to understand and quantify the role of cognitive biases in preventing the recognition, adaptation and prevention of the problems posed by sea level change.
ROCSTAR will resolve ocean heat content changes by using a synergy of several observation techniques, with the aim to identify key regions that affect sea level and precipitation patterns in Southeast Asia.

Moreover, find out about: a new nonlinear land vertical modelling approach that improves tide gauge estimates of sea level rates in earthquake-affected areas, allowing the usage of more in situ data that would be previously discarded;
how can sea level rise information be best derived and applied to guide and support coastal decision making for planning long-term coastal adaptation responses and mitigation targets? A modern conceptual framework facilitates a more transparent communication of high-end sea level rise estimates and a more constructive guidance for stakeholders.

In this issue, we also have an insight into the community of our program, the current synthesis and gender equality distribution, with a special focus on the young SPP SeaLevel scientists and their career steps.

We hope you enjoy reading the SeaLevel Newsletter and thank you for your interest to our program! Feel free to get in touch with us for any questions, suggestions or comments!

Fig. 1: The 2nd funding phase of the SPP SeaLevel has officially commenced in July 2019.

Inside This Issue

Granted 3-year Continuation of the SPP SeaLevel Research

The Priority Program SPP-1889 SeaLevel is granted another round of project to continue its innovative and interdisciplinary research on regional sea level change, its influence and consequences on our population as well as the anthropogenic-driven impact on this delicate balance.

The approval of the 2nd funding phase of the SPP SeaLevel and thus, its 3-year further duration, has been officially announced by the German Research Foundation (DFG) earlier in summer. The SPP SeaLevel started in 2016 with interdisciplinary research, leading to the publication of many important results on sea level change and its impacts on and from society.

The program entered its 2nd funding phase in July 2019. Newly funded projects will deepen our understanding on the contributions of physical processes and anthropogenic causes to global and regional sea level changes, the regional biophysical and societal impacts in Northern Europe and South East Asia/Indonesia as well as the adaptation, decision analysis and governance dynamics, that lead and govern the social dimension of this urgent environmental issue of sea level rise.

As before, natural and social scientists from over 20 German universities and research institutions collaborate and interact, bringing into synergy a range of modern methodologies and approaches together with observations and models from the natural and social science fields to better address the impacts of regional sea level change and the human-environment interactions at the coast.

The newly funded projects are:
1. Sea level changes and storm climate of the last millennium (southern North Sea)
2. Causes of regional sea-level variations on decadal and longer time scales
3. Holocene and Anthropocene sea level records from Indonesia
4. Allocating Responsibility for Regional, Glacier-Related Sea-Level Change
5. Measurements of height and mass changes of glaciers and ice caps outside the large ice sheets using TanDEM-X
6. Derivation of ocean mass distribution and glacial-isostatic compensation from satellite gravimetry and satellite altimetry
7. Determination of heat changes in the ocean by combining satellite gravimetry, Argo and radar altimeter
8. Access of Atlantic Water to East Greenland glaciers
9. Basal Melting in the Greenland Ice Shelf and Effects on Sea Level Variations
10. Regional sea level changes in the marginal seas of southeast Asia: Mechanisms and projections of possible 21st-century trends
11. Storm surges, sea level rise and adaptation measures on the German Baltic coast, taking into account combined extreme events
12. Building adaptive capacity through (trans-) local social capital – sea level rise and resilience of coastal communities and households in selected Indonesian second-tier cities
13. Sea level change and the tragedy of cognition. A comparative study of the role of cognitive biases in understanding sea-level rise
14. Blue Urbanism for Adaptation to Sea Level Change: Global Trajectories and Speculative Future Designs in Island States of Southeast Asia
15. Coordination Funds

Visit the SPP SeaLevel website for a detailed description of the new projects and their planned research.

Our next Annual Meeting, kicking-off the new phase of the SPP SeaLevel, will be held in February 2020 in Bonn, Germany.

It will follow the Early Career Scientists Workshop, exclusively dedicated to the community of our young researchers. All projects from the two phases are welcome to participate and present their work.

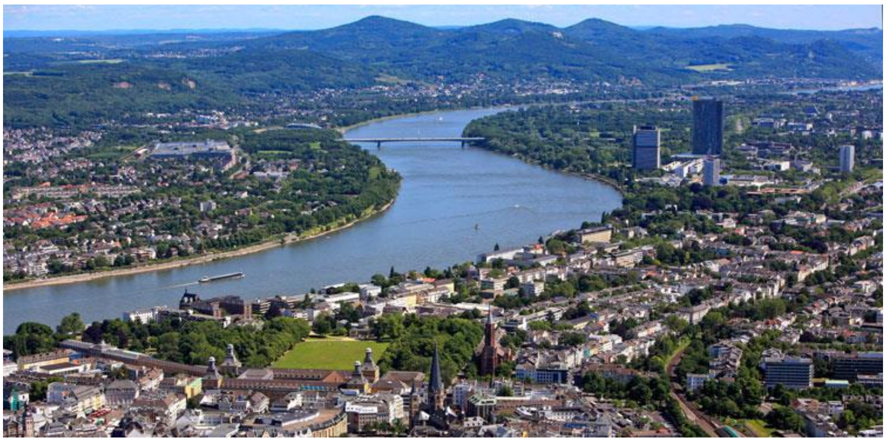


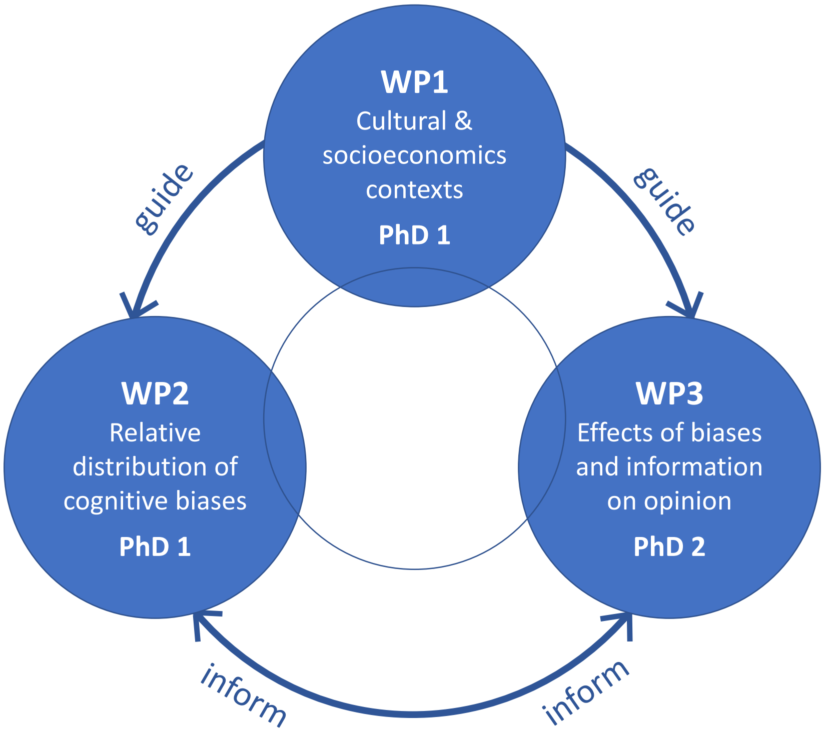
Fig. 2: Our next meeting place: the City of Bonn (© *Presseamt Bundesstadt Bonn*).

SEATRAC: Sea level change and the Tragedy of Cognition – A comparative study on the role of cognitive biases in understanding sea level rise

Achim Schlüter[1] and Agostino Merico[1]; Leibniz Centre for Tropical Marine Research, Bremen

A major challenge faced by our society is to understand the cognitive biases that limit the recognition and prevention of the problems posed by sea level change. We propose a project that integrates experimental economics and mathematical modelling in order to understand and quantify the relative contribution of major cognitive biases in preventing recognition of and adaptation to sea level change.

We will focus on six biases: (1) positive illusion bias, (2) cognitive dissonance, (3) fundamental attribution bias, (4) risk perception bias, (5) in-group bias, and (6) present bias. These biases will be investigated in two contrasting places: Wakatobi Islands (Sumatra, Indonesia) and North Frisian Islands (Schleswig-Holstein, Germany). We will assess the cultural and socioeconomic contexts of the two regions and we will quantify the relative relevance of the biases with surveys and behavioural economics experiments. An Agent-Based Model will integrate the relevant information obtained into a broader and flexible simulative context. Numerical experiments will allow us to explore a number of bias distribution hypotheses and their effects in the context of different sea level change scenarios.



PhD 1 – Behavioural Economics

Regional focus: Wakatobi Islands & North Frisian Islands;
Methods: case studies, surveys and economic experiments;
Main objectives: (1) qualitatively assess the cultural and socioeconomic contexts and (2) quantify the relative relevance of the cognitive biases at the individual level and relative to adaptive behaviour.

PhD 2 – Mathematical Modelling

Methods: Agent-Based Model simulations;
Main objectives: (1) further model development and parameterisation and (2) explore the effects of different bias distribution hypotheses and sources of information related to sea level rise on opinion formation.

Fig. 3: The structure of the SEATRAC project, starting in the 2nd phase of SPP SeaLevel.

We are hiring !!!

The **SEATRAC project** is looking for two PhD candidates to conduct research on:
i) Institutional & Behavioral Economics and
ii) Mathematical Modelling
at the Leibniz Centre for Tropical Marine Research (ZMT) in Bremen, within the working groups Institutional and Behavioral Economics and System Ecology.
For more information:

www.spp-sealevel.de → "Resources"→ "Jobs"

Deadline for applications is 30th September. For any questions, please contact: Prof. Dr. Agostino Merico (agostino.merico@zmt-bremen.de)

ROCSTAR: A heat seeking quest in the ocean

Roelof Rietbroek[1] and Alisa Yakhontova[1], University of Bonn

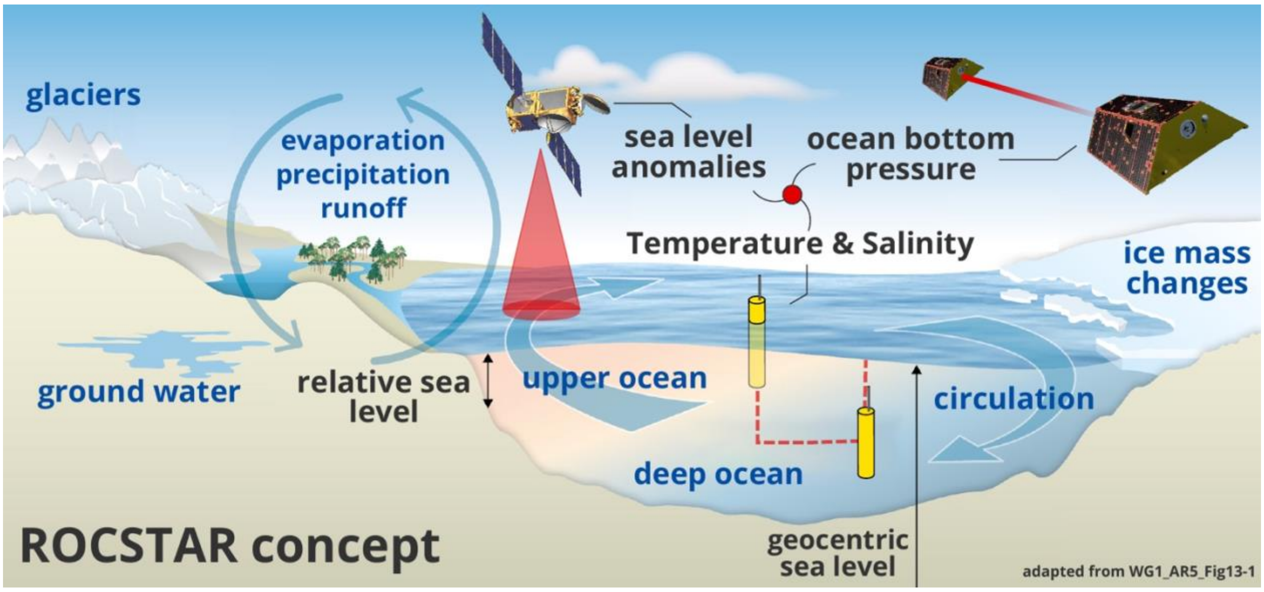


Fig. 4: Within ROCSTAR, several observations techniques are combined to track ocean heat change.

Warm blobs in the ocean

The ocean is absorbing the majority of the excess heat which is trapped in the Earth system. As a consequence, the ocean is warming up, but this is not a uniform process. Rather, a complex interaction between currents, upwelling from the deep, vertical mixing induced by winds and changes in the energy fluxes at the surface, cause some parts of the ocean to heat up quicker than others. To further complicate things, these warm blobs of water are anything but steady, and depending on the prevailing winds they function as an important moisture source for precipitation over land.

Tracking heat change

Fortunately, there are multiple ways to track these warm blobs. A direct way is to measure vertical profiles of temperature (and salinity) with freely drifting Argo floats. However radar altimetry, measuring changes in the ocean surface is also sensitive to ocean heat changes as the ocean expands when it warms up. Furthermore, when a water column in the deeper ocean expands, the higher column of water may induce a mass flow onto shelf areas. Such effects can be expected in South East Asia, and are potentially large enough to be picked up by the Gravity Recovery and Climate Experiment (GRACE) and its follow-on which is currently orbiting the Earth.

Combining is key

In the 2nd phase of the SPP, the newly initiated project: "**Resolving Ocean Heat Content changes by combining Space gravimeTry, Argo and Radar Altimetry**', short ROCSTAR, we will consistently combine the above observations to find regions of ocean heat content change and see how they affect sea level, and precipitation patterns in South East Asia.

The **Sea Level Documentation Database** is constantly expanded with all kind of sea level-related references from both the natural & social sciences, serving as a valuable source of sea level information for everyone interested!

You can also help develop further the Sea Level Documentation Database by forwarding us your publications, reports and other material!

www.spp-sealevel.de → "Resources"→ "Sea Level Documentation Database"

Improving tide gauge estimates of sea level rate in earthquake-affected areas by nonlinear Vertical Land Motion modelling

Jürgen Kusche; Institute of Geodesy and Geoinformation (IGG) – University of Bonn

In earthquake-affected areas such as the Western North Pacific, Alaska, Indonesia or South America, tectonic motion resulting from the collision of plates plays a main role in relative sea level (RSL) rise and represents the largest contributor to vertical land motion (VLM). VLM models for these areas should include at least a velocity change, occurring at the time of the earthquake. Models can no longer be considered as linear.

In a recently published paper Klos et al., 2019, a collaboration with colleagues from the Warsaw Military University of Technology, Poland, the IGG/Uni-Bonn, Germany and the University of Beira Interior, Portugal, we propose a new methodology that better represents the Global Positioning System (GPS)-derived nonlinear VLM and noticeably improves absolute tide gauge sea level (ASL) estimates by 20% on average, bridging their difference with altimetry estimates. Furthermore, employing the new nonlinear VLM model leads to a much better agreement between direct and indirect RSL estimates, which is of high importance for coastal engineering and planning.

Traditionally, tide gauge records are corrected for VLM using model-based Glacial Isostatic Adjustment (GIA) corrections, which however contain large uncertainties related to the insufficiently known viscoelastic properties of the earth's interior; moreover this ignores any land motion caused by present-day tectonic, seismic and environmental effects. Thus, the key assumption of linear VLM over the entire time span of tide gauge records is not true, particularly for areas influenced by present-day time-varying (e.g. volcanic, human, tectonic) processes.

In the Western North Pacific for the 1993–2015 period, simply discarding all earthquake-affected sites, the average RSL rise is overestimated by more than 0.5 mm/year. Not accounting for the changes in vertical velocities and displacement due to the tectonic movements and estimating ASL rise from tide gauges can result in an error of 10 mm/year. Disregarding VLM would lead to misestimating local sea level trends between 0.2 and 7.6 mm/year. If accounted for, but modeled as linear during the entire time span, VLM leads to regional ASL rise errors of up to 0.4 mm/year.

(*Continued*)

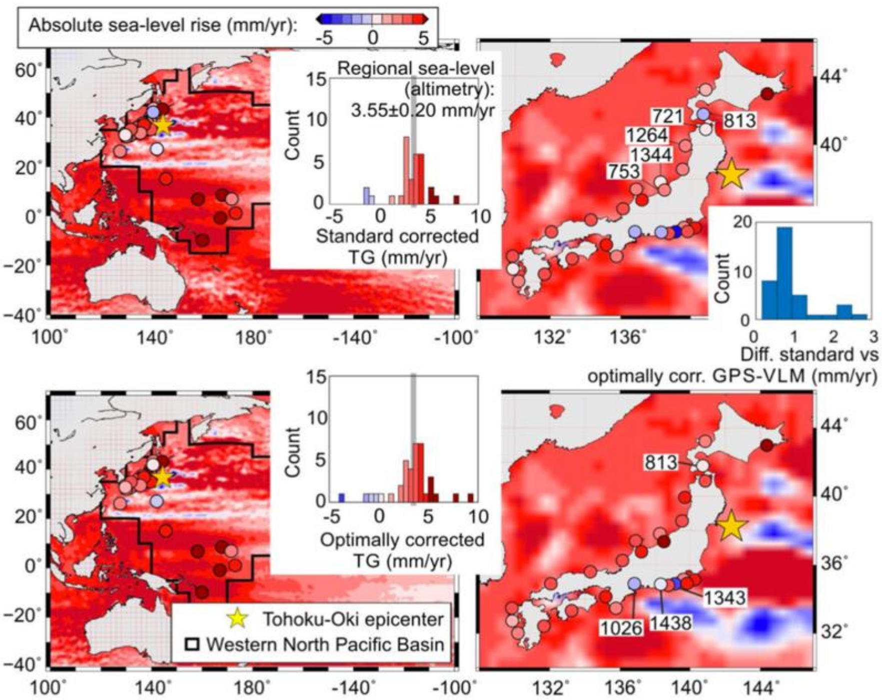


Fig. 5: Tide gauge-derived ASL rise (dots) vs ESA CCI multi-mission gridded sea level anomalies (background colored-map). (top) Tide gauge records corrected using the standard linear land motion vs (bottom) using the optimized nonlinear land motion. The differences between absolute tide gauge-derived trends from the two approaches are plotted in histogram at top panel.

Klos, A., J. Kusche, L. Fenoglio-Marc, M.S. Bos, & J. Bogusz (2019), Introducing a vertical land motion model for improving estimates of sea level rates derived from tide gauge records affected by earthquakes, GPS Solutions, 23(102).

The newly proposed nonlinear VLM model accounts for co-seismic offsets, changes in the vertical velocities and post-seismic transient, therefore allowing for a better usage of data from tide gauge stations in earthquake-affected areas, which would otherwise be normally excluded from the already poor spatial sampling network of tide gauges. We find a maximum difference of 15.3 mm/year between pre- and post-seismic vertical velocities. The GPS-sensed vertical co-seismic displacement approaches 36 mm. The improved nonlinear VLM model reduces the difference between altimetry- and tide gauge-derived ASL trend estimates as well as for the reconstructed by tide gauges Western N. Pacific sea level. The new VLM may also be helpful to estimate RSL rise for areas where tide gauges were destroyed during large earthquakes, as the S. America Pacific coasts, where only a few tide gauges are operating at the moment.

A conceptual framework for high-end sea-level rise estimates for stakeholder applications

Detlef Stammer[1] and Jochen Hinkel[2]; [1]Center for Earth System Research & Sustainability-University Hamburg, [2]Global Climate Forum, Berlin

A new conceptual framework to help users to apply sea-level rise information and better inform the science community about these needs.
How can sea level rise information be best derived and applied to guide and support coastal decision makers and stakeholders for planning long-term coastal adaptation responses and mitigation targets?

Information on high-end sea level rise projections has been usually derived either from a likely range of future sea-level rise under the various simulated climate change scenarios and anthropogenic CO_2 emissions (i.e. the so-called RCP8.5 scenario) in the IPCC Assessment Report (AR5) or from independent ad-hoc studies and expert solicitations. The interpretation of this information is left to experts' judgement.
Ideally, users require high-end sea level rise information that has to account for all plausible yet unknown future emission scenarios, in addition to all involved natural variability and physical mechanisms of sea level (i.e. the upper tail of a joint sea level frequency distribution), which is not possible. As concluded at the last IPCC AR5, there was insufficient evidence in published literature to describe the shape of the tail of the probability distribution or any asymmetry of it, both essential information to risk adverse stakeholders. Estimates of high-end sea-level rise become increasingly uncertain further into the future. Our limited understanding of physical processes driving Antarctic ice sheet dynamics and the lack of detailed knowledge of future emissions represent the largest uncertainties, particularly as regards long-term sea-level rise projections.

The new paper *Stammer et al., 2019* contributes towards linking robust sea- level science and IPCC-information with coastal climate services, stakeholder needs and local user requirements in a more practical way, by providing a generic conceptual framework to help users to apply sea-level rise information as a function of time scale and better inform the science community about these needs.

In the absence of high-end sea level information representing the upper tail of a single joint sea level frequency distribution, the newly proposed framework enables to infer the required information from explicit conditional statements (lines of evidence) in combination with upper (plausible) physical bounds, while acknowledging the growing uncertainty as we look further into the future. In addition to scientific accuracy, it also considers the wide range of risk aversion levels and the various types of stakeholder decisions and applications on coastal policy and adaptation.
Very importantly, by linking sea-level science and stakeholder needs, the proposed conceptual framework contributes towards a more transparent of high-end sea level rise

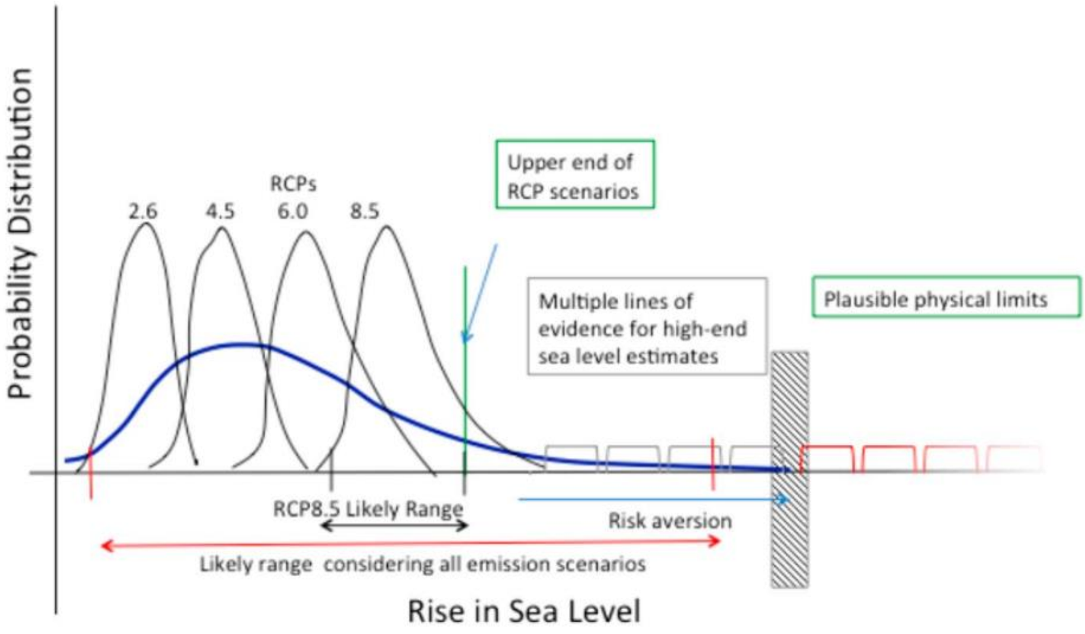


Fig. 6: Multiple concepts of high-end sea level. The x-axis is the amount of sea level rise for a given time interval. In the vertical the figure displays the probability density. The blue curve represents a combined pdf for all possible emission scenarios. The gray and red building blocks have to be added to the Representative Concentration Pathway (RCP) curves depending on the risk aversion of the users. The hatched vertical bar represents the range in which the high-end is being expected to reside for a particular stakeholder. The distinction between gray and red building blocks is lines of evidence versus physical implausibility (Stammer et al., 2019).

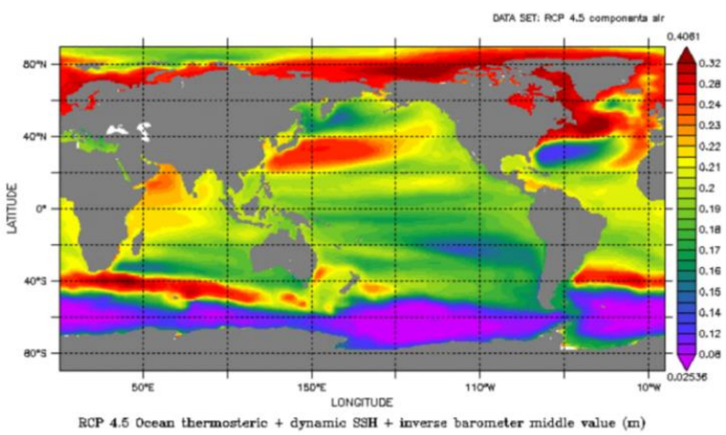
estimates to a wider audience and to a more constructive guidance for stakeholders which is often absent.

This work is a collaboration of an international team of sea level experts from Germany, the Netherlands, UK, Australia, France, Singapore and United States. The content of this publication initially emerged during the "High-end sea level scenarios" Workshop which was held in Hamburg in September 2017, partially supported by the SPP SeaLevel and the WCRP Grand Challenge on Regional Sea Level Change and Coastal Impacts.

Stammer, D., R.S.W. van de Wal, R.J. Nicholls, J.A. Church, G. Le Cozannet, J.A. Lowe, B.P. Horton, K. White, D. Behar, and J. Hinkel (2019), Framework for high-end estimates of sea-level rise for stakeholder applications, Earth's Future, 9.

A simple tool to instantly **extract and visualize** IPCC AR5 global and coastal sea level projections for everyone!
Alternatively, you can get access and download the datasets directly from the Integrated Climate Data Center (ICDC), University Hamburg.
Try it and learn about regional differences in sea level rise!

www.spp-sealevel.de → "Resources"→ "Extract and Visualize Sea Level Projections"



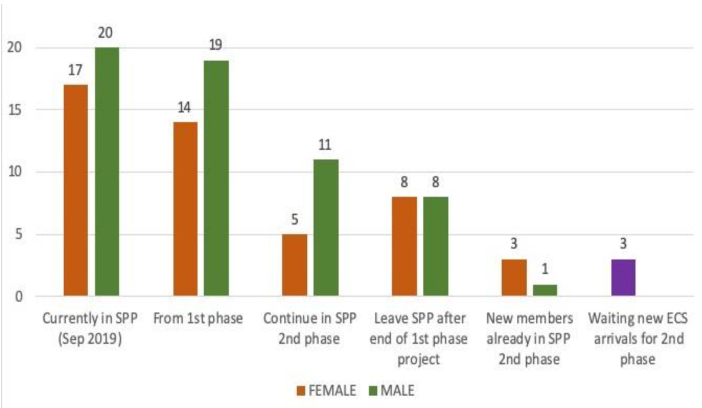
The current synthesis of the SPP SeaLevel Community: structure & gender distribution – Special focus on the Early Career Scientists & their future steps

What is the current status of the SPP SeaLevel group and the state of the Early Career Scientists within the program? How does the transition to the 2nd phase reflect on the structure of the SPP SeaLevel community?

In line with the progression period into the 2nd phase of the program, the constitution of the SPP SeaLevel community undergoes alterations on the total number, gender distribution and composition at the different levels of the scientific ranking, particularly for the Early Career Scientists Community.

Currently, 36 young scientists (based on data collected in August/September 2019) do their research within the SPP SeaLevel on a PhD or postdoc level, including 4 new ECS members who already joined the program for its 2nd phase (Fig. 7), while 3 further ECS are due to be hired within the next few months. 33 members from the above belong to projects from the 1st phase of the program, some of which are due to conclude their work within the next short-term period, while others have ensured a longer extension of their project (due to e.g. parental leave), and therefore, will continue within the SPP program beyond the end of 2019. Nevertheless, as regards the 2nd phase projects, only 16 ECS from the old group will continue their research for another 3-year period, as their corresponding projects were granted funds in the new phase. In their majority, the extended funding will allow the young scientists to complete their PhD work, or/and to progress it eventually on a postdoc level (Fig. 7 and 8).

Overall, there is a reduction of the total number of the SPP SeaLevel members from the 1st phase by 43% (based on data in Aug. 2018 for the 1st phase), given also that the funded research projects dropped off from 20 to 14 in the 2nd phase, in addition to the Coordination project. This decrease is further reflected on the ECS group, which during the 1st phase, comprised of 21 postdocs and 15 PhD students, i.e. respectively 9% and 7% less young members in the 2nd phase, as compared to the proportionally similar number of PI members between the two phases (Fig. 8).



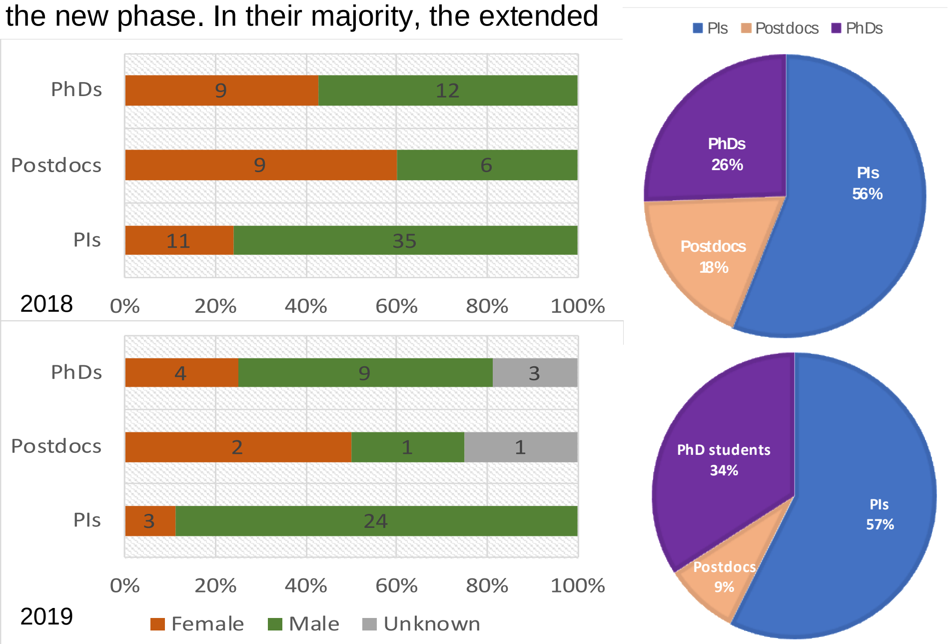


Fig 7: (top) The current state (as in September 2019) of the Early Career Scientists Community of the SPP SeaLevel program in terms of number of members and gender distribution.

Fig 8: (left) Gender and academic rank composition of the SPP SeaLevel community in the (top plots) 1st phase (as in Aug. 2018) and (bottom plots) 2nd phase (as in Sep. 2019 - based on available data so far). 82 members consisted the program during the 1st phase, while 47 members in total are expected to work within the 2nd phase.

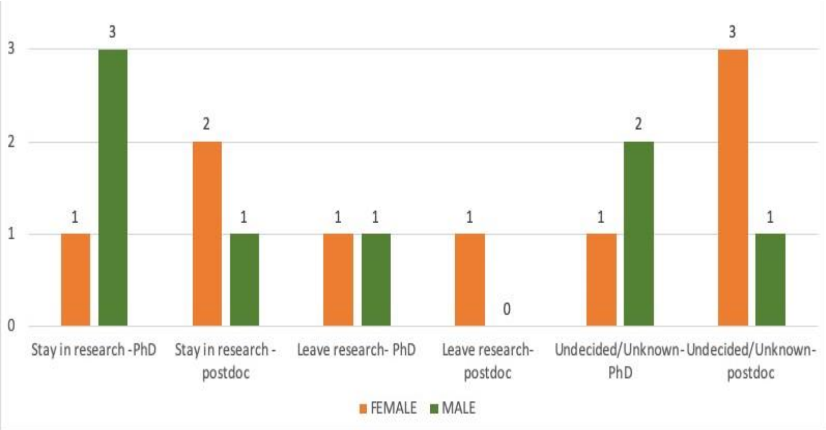


Fig 9: The future career steps of the ECS members from the 1st phase of the SPP SeaLevel program and their gender distribution (based on available data in Aug/ Sep 2019). The label of "PhD" or "postdoc" in each category indicates their current professional status.

Among the young scientists of the 1st phase of the program who have already departed from the SPP SeaLevel program or will eventually in the coming period due to the project's end or a personal shift in their professional position/institution, only 6 of them clearly denote to continue pursuing a research career (Fig. 9). 3 ECS members have already decided to leave research/academia and follow a different career path, such as to private sector, NGOs, etc., while 7 of them are still undecided or did not volunteer to provide information on their next professional steps. Fig. 9 also demonstrates the gender distribution in each of the above categories, and the current professional status of the ECS members, i.e. whether on a PhD or postdoc level.

And how about the rest of the SPP community?

The smaller number of research projects funded in the 2nd phase is also reflected on the PIs community with a reduction of about 59%, i.e. from 46 in the 1st to 27 members in the 2nd phase. The decrease is particularly apparent at the number of females with only 3 women supervising projects as PIs within the new phase, i.e. ~ 13% less than in the 1st round (Fig. 9 and 10). The proportion of Doctors versus Professors among the PIs is balanced at the 2nd phase, with a 69% decrease of members on Professorship level at the new structure of the SPP SeaLevel.

Are you an early career scientist in the SPP community & looking for a mentor?

Or are you a senior researcher or professor and would like to volunteer as a mentor?

Check the ***SPP SeaLevel Mentoring Network for ECS***!

Info @ the SPP SeaLevel Redmine/Wiki area!

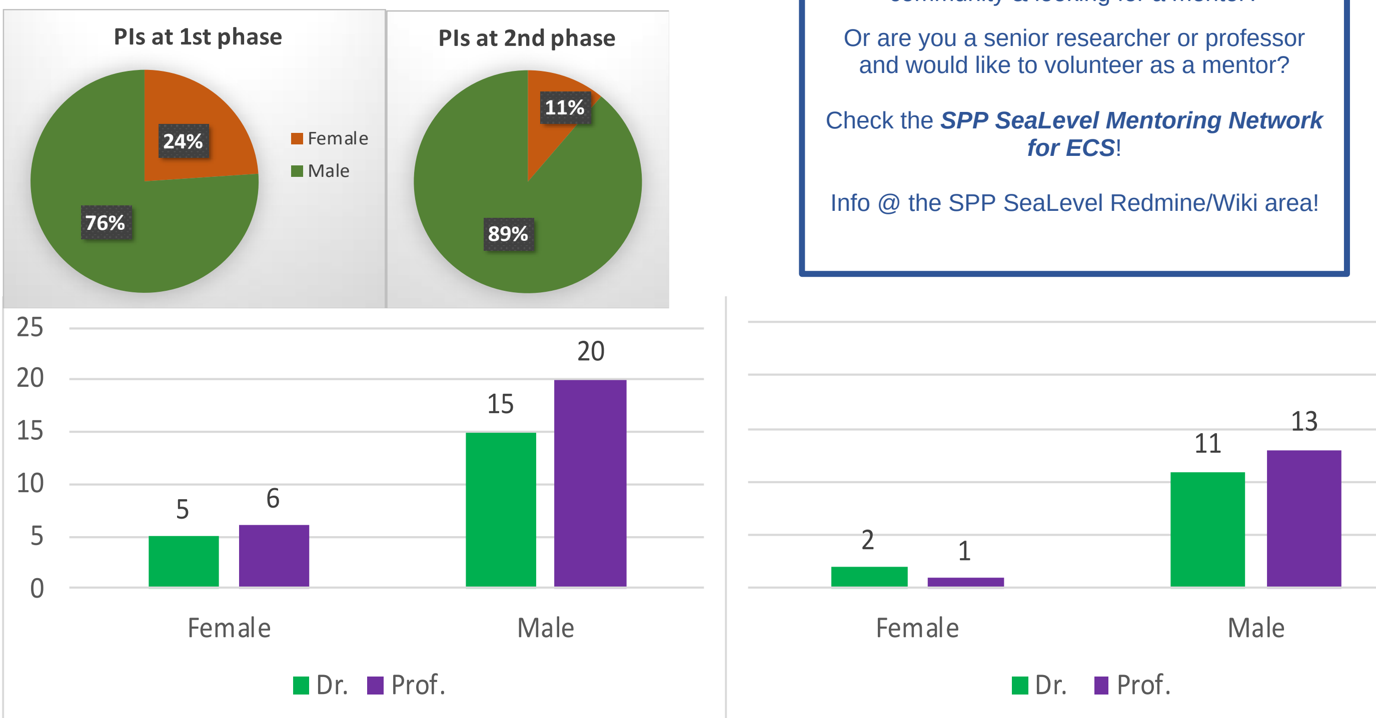


Fig 10: The structure and gender distribution of the Principal Investigators at the (left) 1st and (right) 2nd funding phase of the SeaLevel program.

Early Career Scientists are awarded Their Own Research Project in the 2nd SPP SeaLevel phase

A great advance of their professional career, the new SPP SeaLevel phase offers the opportunity to two previously postdoc researchers of the program, Dr Rapti Siriwirdane-de Zoysa (ZMT) and Dr Johannes Herbeck (Uni-Bremen), to lead their own research project as PIs during the 2nd phase, named “BlueUrban”. Congratulations to both for their great achievement!

Fig 11: Moments of Rapti’s and Johannes’ fieldwork in Indonesia during the EMERSA project.

Rapti Siriwardane-de Zoysa is a marine anthropologist with a DPhil from the University of Bonn´s Zentrum für Entwicklungsforchung, and a MSc. in Environmental Politics from the University of Oxford´s School of Geography and the Environment. She is presently a postdoctoral researcher at the Leibniz Centre for Tropical Marine Research in Bremen, where she served as scientific co-ordinator for the SPP 1889 first-phase project EMERSA, co-lead by A-K Hornidge and M Flitner. Given her undergraduate training on the political ecologies of the Malay-Indonesian archipelago at the National University of Singapore, EMERSA brought her ‘back’ to the region. What enriched her ethnographic fieldwork across varied urban environments during this first phase, was the ability to meander between local community-level and policymaking worlds. This multi-sited fieldwork offered her a more nuanced understanding of how communities make sense of material boundaries between surface land, water, atmosphere and tectonics in multiple ways, particularly with regard to how 'sea level change' as a reality comes to be differently framed, politicized, and acted upon by local and regional actors.
The seeming ambivalence between policies and practices of high-value shoreline property development versus hard infrastructural coastal protection (i.e. living with water as opposed to protective living away from water), sparked her interest in co-developing a second phase project with her colleague, human geographer Johannes Herbeck. Their new project, *‘Towards Blue Urbanism for Sea Level Change Adaptation: Global Trajectories and Speculative Futuring in Island Southeast Asia’* **(BlueUrban)** enables a continuation of their work into the second SPP phase. BlueUrban brings in a stronger infrastructural focus given their interest in two pervasive technological practices for sea level change adaptation – multifunctional ‘super’ dykes and large floating structures (including artificial islands). As an environmental anthropologist, she is particularly interested in how broader utopian/dystopian visions and everyday urban practices remake the futures of coastal metropolises in the decades to come.

Johannes Herbeck has studied human geography, political sciences, and sociology at the Technical University of Munich and the Ludwig-Maximilians-University in Munich, Germany. Since 2008, he has been working as researcher at the Sustainability Research Centre at the University of Bremen, Germany. In 2014, he was awarded a PhD for his thesis *Geographies of Climate Change: Vulnerability, security, translocality*. Since then, he has been a researcher and scientific coordinator in different projects and has carried out research in West Africa and Southeast Asia. Most recently, at the project EMERSA, he has mainly investigated the mobility of policies for coastal protection and sea level rise adaptation in and between mega cities in Southeast Asia.

Given his strong interest in political ecology, policy mobilities, as well as coastal adaptation, he is enthusiastically looking forward to the 2nd funding phase of SPP and his work in the BlueUrban project He is especially interested in understanding the global connectedness of innovations for sea level rise adaptation and to analyze the networks and modes of translations that constitute the circulation of new ideas and technologies of coastal protection.

Recent SPP SeaLevel Publications:

TRANSOCAP project:

Bott, L.M., and **B. Braun** (2019), How do households respond to coastal hazards? A framework for accommodating strategies using the example of Semarang Bay, Indonesia, International Journal of Disaster Risk Reduction, 37(101177).

Bott, L.M., L. Ankel, and **B. Braun** (2019), Adaptive neighborhoods: The interrelation of urban form, social capital, and T responses to coastal hazards in Jakarta, Geoforum, 106, 202-213.

SATELLITE project: Braun, M.H., **P. Malz**, **C. Sommer**, D. Farías-Barahona, T. Sauter, G. Casassa, A. Soruco, P. Skvarca, and T.C. Seehaus (2019), Constraining glacier elevation and mass changes in S. America, *Nature Climate Change*, doi:10.1038/s41558-018-0375-7.

SEASTORM project: Lang, A., and U. Mikolajewicz (2019), The long-term variability of extreme sea levels in the German Bight, *Ocean Sci.*, 15, 651-668.

SEASchange project: Mann, T., **M. Bender**, T. Lorscheid, P. Stocchi, M. Vacchi, A.D. Switzer, and **A. Rovere** (2019), Holocene sea levels in SOutheast Asia, Maldives, India and Sri Lanka: The SEAMIS database, Quaternary Science Reviews, 219, 112-125.

SEASCApe Baltic project: Van der Pol, T., and J. Hinkel (2019), Uncertainty Representations of Mean Sea-Level Change: A Telephone Game?, *Climatic Change*, 152 (3-4), 393-411.

Find the full list of the SPP SeaLevel published papers at *www.spp-sealevel.de* → *“Resources”* → *“Publications”*

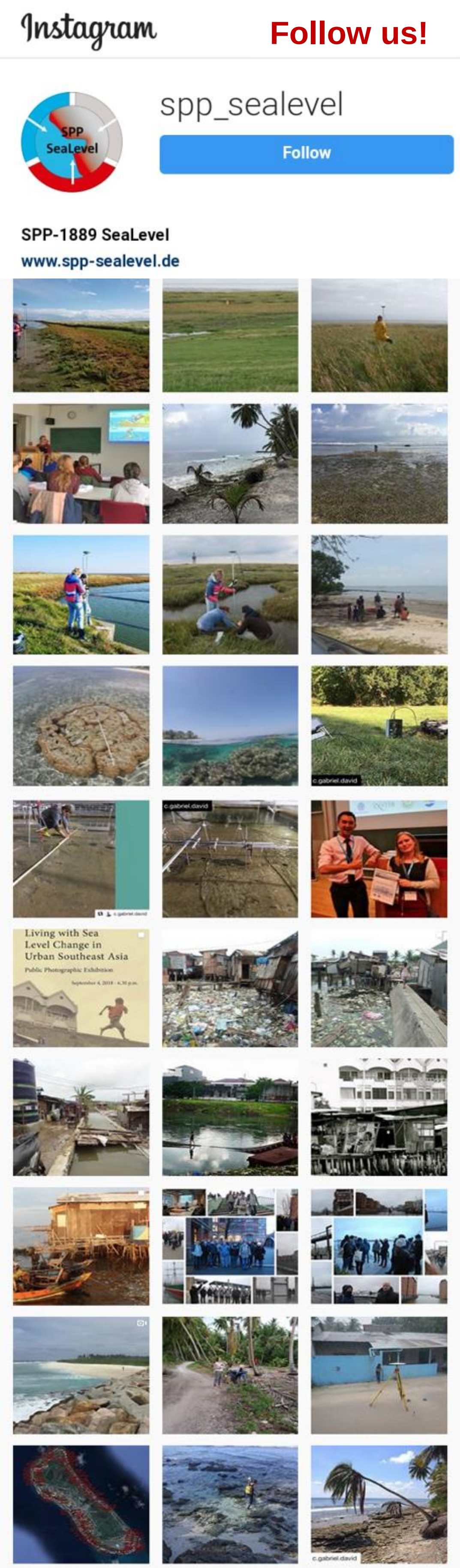
Info & Data Exchange within the SPP SeaLevel Program

Find out about the data exchange possibilities within the SPP SeaLevel community!

At the **SPP SeaLevel Redmine & Wiki platforms**
all members/projects can:

- upload & share datasets, plots, images, …
- set inquiries & requests for data exchange
- share fieldwork info & other material
- find links for other external resources & databases

& much more!



Coming Events related to Sea-Level:

"*Extreme Events – Building Climate Resilient Societies" Conference*, 9-11 October, Hanover, Germany

International Conference on Regional Climate (ICRC- CORDEX 2019), 15-18 October, Beijing, China

"*Institute of Advanced Studies in Climate Extremes and Risk Management" School*, 21 October-1 November, Nanjing, China

Training School "Coastal zone management out of geological perspective", 1-2 October, Gdańsk, Poland

GLOSS Event: Global Ocean Social Sciences, 5-6 November 2019, Brest France

Society and Sea Conference: Invest in Blue, 9-11 September 2020, London, UK

25th Biennial CERF Conference 2019:"Responsive, Relevant, Ready", 3-7 November 2019, Mobile, AL, USA

2020 Social Coast Forum, 3-6 February 2020, S. Carolina, USA

9th EUROLAG Conference on coastal lagoons and transitional environments, 20-24 January 2020, Venice, Italy

International Indian Ocean Science Conference, 16-20 March 2020, Goa, India

Climate Change in the Asia-Pacific Region: from Environmental Aspects to Socio-Economic Impacts, 30 March- 3 April 2020, Quy Nhon, Vietnam

Marine Socio-Ecological Systems (MSEAS) Conference, 25-29 May 2020, Yokohama, Japan

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