



## Annual Report\* of IGCP Project No.639

**\*NOTE: MAXIMUM LENGTH OF THE TEXT REPORT IS 5 (FIVE) PAGES (starting from question 1). SINGLE SPACE, 12 POINT FONT. REPORTS EXCEEDING THIS LENGTH WILL BE RETURNED TO THE AUTHOR(S) WITH THE REQUEST OF REDUCING THE TEXT TO THE ABOVE STANDARD.**

**Send to UNESCO and IUGS**  
[ml.faber@unesco.org](mailto:ml.faber@unesco.org)

**by 01/12/2016**

**A LIST OF PUBLICATIONS HAS TO BE ADDED AS AN ANNEX.**

**\*REMINDER: IF THIS IS THE FINAL YEAR OF YOUR PROJECT, PLEASE SUBMIT A REVIEW ARTICLE ABOUT YOUR PROJECT TO THE IUGS JOURNAL 'EPISODES'.**

The scientific information in this report will further be used for publication on the IGCP website hosted at UNESCO (please feel free to attach any additional information you may consider relevant to the assessment of your project).

**IGCP project short title: Sea Level Changes from Minutes to Millennia**

**Duration: 2016-2020**

**Please tick this box if the report is for a Project on extended term (OET):**

**Project leader(s):**

1. Name: Simon Engelhart  
 Address: University of Rhode Island, Geosciences, 336 Woodward Hall, 9 East Alumni Avenue, Kingston, RI, 02881, USA  
 Tel.: +1 401 874 2187  
 Fax: +1 401 874  
 Email: engelhart@uri.edu
  
2. Name: Gösta Hoffmann  
 Address: Bonn University, Geology, Nussallee 8, 53115 Bonn, Germany  
 Tel: +49 228 73 4711  
 Fax: +49 228 73 9037  
 Email: ghoffman@uni-bonn.de
  
3. Name: Fengling Yu  
 Address: Xiamen University, Geological Oceanography, Xiping Building, South Xiang'an Road, Xiamen 361005, China  
 Tel: +86 592 2182374  
 Fax: +86 592 2183064  
 Email: fengling.yu@xmu.edu.cn

4. Name: Alar Rosentau  
Address: University of Tartu, Geology, Ravila 14A, Tartu, Estonia  
Tel: +372 5155231  
Fax:  
Email: alar.rosentau@ut.ee
- 

**Project Secretary:**

Name: Simon Engelhart  
Address: 336 Woodward Hall, 9 East Alumni Avenue, Kingston, RI, 02881, USA  
Tel.: +1 401 874 2187  
Fax: +1 401 874  
Email: engelhart@uri.edu

---

**Date of submission of report: December 22nd, 2016**

**Signature of project leader(s):**

### Guidelines for Annual Report

Please use the following headlines to report the present status and scientific achievements of your project (write N/A where not applicable) and explain abbreviations you use in your report.

#### 1. Website address(es) related to the project

<http://www.sealevelchange.org>

<https://www.researchgate.net/project/IGCP-Project-639-Sea-Level-Change-from-Minutes-to-Millennia>

#### 2. Summary of major past achievements of the project

As this is the first year of the project, all major past achievements are outlined in section 3.

#### 3. Achievements of the project this year only

##### 3.1. General scientific achievements

*(Meetings are not considered as scientific achievements, they should be listed under heading 3.3.)*

Development of a special issue arising from the EGU session on Extreme Wave Events, to be published in Marine Geology in 2017. 16 papers have been submitted and are either accepted or in the final stages of review.

We have submitted additional funding requests to other organizations to support the goals of project 639. These include PAGES and INQUA.

Formation of three working groups based on the project themes identified the proposal. Leadership of the groups is now in place and they will be staffed by a diverse array of researchers. Recruitment has started since the working groups were finalized at the Oman meeting.

Published 11 papers including in leading journals such as Proceedings of the National Academy of Sciences, Geophysical Research Letters, Earth Science Reviews, and Quaternary Science Reviews.

Meeting report on Oman conference and workshop to be submitted to EPISODES for publication in 2017 (report was attached to the meeting report form).

Reaching over 150 followers across social media platforms.

##### 3.2. List of IGCP project meetings/symposia and IGCP related meetings/symposia with exact attendance (if possible) and number of countries

European Geophysical Union, Austria: 9 oral presentations and 15 poster presentations. Attendance at oral session was ~350 People. Presenting

participants from France, USA, Oman, UK, Japan, Germany, India, China, Belgium, and Singapore.

GeoSUB 2016, Italy: 76 attendees comprised of participants from Italy, Greece, Slovenia, and Canada. Two Egyptian participants could not attend at last minute due to visa issues.

Annual Meeting in Muscat, Oman: 52 attendees comprised of participants from Brazil, China, Estonia, Germany, Hungary, India, Lithuania, Netherlands, Oman, Pakistan, Philippines, Portugal, Singapore, South Africa, United Kingdom, United States of America, United Arab Emirates.

3.3. *Educational, training or capacity building activities related to the IGCP project and IGCP project participants.*

We ran a one day training workshop focused on techniques, successes, and challenges at the Oman meeting. This reached both conference attendees and 14 female Omani undergraduate students who are interested in careers in coastal hazards.

Engelhart ran a residential program for high school students (ages 16-18) to teach them about sea-level rise and climate change, the science behind it, and the techniques used. A major focus was the methodologies developed during previous IGCP sea level projects.

3.4. *List of countries involved in the project (please \*indicate the countries active this year and make the distinction between:*

Active this year: Belgium, Brazil, Canada, China, Estonia, France, Germany, Greece, Hungary, India, Italy, Japan, Lithuania, Netherlands, Oman, Pakistan, Philippines, Portugal, Singapore, Slovenia, South Africa, United Arab Emirates, United Kingdom, United States of America.

3.5. *Participation of scientists from developing countries, and in particular young and women scientists: exact number and please describe how this project specifically benefited women scientists, young scientists and/or scientists from developing countries*

	<i>Total number of scientists</i>	<i>Number of male scientists</i>	<i>Number of female scientists</i>
<i>Number of participating scientists</i>	141	79	62
<i>Number of young scientists/students (&lt;35 years old)</i>	48 of 79*	19*	29*
<i>Number of scientists from developing countries</i>	11	5	6

\* these numbers only calculated for EGU and Annual Meeting as data not collected for GeoSub

Over 60% of the attendees at the annual meeting and workshop were either women scientists and/or young scientists. Greater than 30% of the attendees were from nations typically underrepresented within the field.

3.6. *List of the 5 most important publications (including maps) of this year  
a) could not have been published were it not for this project*

Given this is the first year of the project, no publications fall under this category.

*b) related to this project*

Brain, M.J., 2016. Past, present and future perspectives of sediment compaction as a driver of relative sea level and coastal change. *Current Climate Change Reports* 2(3), 75-85.

Garrett, E., Fujiwara, O., Garrett, P., Heyvaert, V.M.A., Shishikura, M., Yokoyama, Y., Hubert-Ferrari, A., Bruckner, J., Nakamura, A., De Batist, M, the QuakeRecNanakai team, 2016. A systematic review of geological evidence for Holocene earthquakes and tsunamis along the Nankai-Suruga Trough, Japan. *Earth-Science Reviews* 159, 337-357.

Karegar, M.A., Dixon, T.H., Engelhart, S.E., 2016. Subsidence along the Atlantic coast of North America: Insights from GPS and late Holocene relative sea level data. *Geophysical Research Letters*, doi:10.1002/2016GL068015.

Lin, N., Kopp, R.E., Horton, B.P., and Donnelly, J.P., 2016. Hurricane Sandy's flood frequency increasing from year 1800 to 2100. *Proceedings of the National Academy of Sciences of the United States of America* 113(43), 12071-12075.

Pennetta, M., Stanislao, C., D'Ambrosio, V., Marchese, F., Minopoli, C., Trocciola, A., Valente, R., Donadio, C., 2016. Geomorphological features of the archaeological marine area of Sinuessa in Campania, southern Italy. *Quaternary International* 425, 198-213.

*Full bibliography of this year (listed by author in alphabetical order with the most recent work listed first) has to be submitted as an annex. Distinguish between peer review literature and other (no abstracts).*

*a) could not have been published were it not for this project*

*b) related to this project*

These publications are listed in attached appendix 1.

### *3.7. Activities involving other IGCP projects, UNESCO, IUGS or others*

No major activities this year. Notification of proposal success came after the deadlines for participation in the 35<sup>th</sup> IGC.

We have had introductory discussions with Lorena Moscardelli of Project 640 on potential synergies and interactions between groups in future years.

*3.8. Scientific Legacy: Is there a need for storage of publications, field data, and other results of the project? Do you have a clear vision concerning where the data would be stored and who will be the custodian?*

As with previous coastal IGCP projects, we expect that project 639 will continue the success of this first year and produce large amount of data and publications that need to be stored. We are addressing this by a two-pronged effort that involves utilizing both

currently available commercial solutions (ResearchGate), as well as developing an extended version of the pre-print repository that was established by IGCP project 588. This ensures that there is both excellent visibility through ResearchGate, but retaining a second portal run by ourselves, ensures the data and publication availability is future-proofed, were the commercial option to disappear. All participants submitting publications that credit project 639 are strongly encouraged to deposit data in free, open source repositories, and this will be a requirement for publication in the 2017 special issue that will arise from the results presented at the 2016 and 2017 meetings.

*3.9. What tangible improvements has your project obtained? (Besides publications, we are interested to hear about improvements to research, scientific contacts, policy implications, etc)*

Publications are discussed in section 3.6 and appendix 1. The project achieved its first goal this year of improving the scientific links to the Middle East. This was achieved by holding the first meeting in this focus region. An outcome of this will be further research into coastal hazards in the Arabian Sea and Strait of Hormuz, including the Makran subduction zone.

*3.10. What kinds of activities in respect to the benefit of society and science outreach has your project undertaken?*

Engelhart is a regular speaker at high schools and community events, disseminating the results of this project to a wide audience within his home region. Further, Engelhart led a two-week residential field trip for students aged 16-18 on climate change and sea-level rise. Students learnt the science behind climate change and sea-level rise, as well as being introduced to how we undertake coastal hazards research under the IGCP banner.

At the first annual meeting in Muscat, Oman, we ran a one day workshop on techniques, successes, and challenges relevant to coastal hazards research. This was attended by over 50 participants including 14 female Omani undergraduate students who are interested in careers within this field.

*3.11. What kind of public information (media reports, etc) has your project generated? And how do you evaluate their impact?*

<http://www.gutech.edu.om/unescos-international-project-sea-level-change-from-minutes-to-millennia-conference-held-at-gutech/>

#### **4. Activities planned**

##### *4.1. General goals*

We will hold our annual meeting in South Africa between September and November of 2017. This is the first time a coastal themed IGCP meeting will be held in South Africa. This meeting will be associated with a workshop on constructing sea-level databases, with the express aim of making available data from our focus regions (Middle East, Africa, South America). We will arrange and start the publication process for a special issue arising from the research presented at the first two annual meetings. We are approaching Quaternary Science Reviews who have been very supportive of past IGCP special issues.

##### *4.2. Tentative list of specific meetings and field trips (please list the participating countries)*

Extreme wave events session at EGU, Vienna, Austria. April 2017.

Sea level change session at AOGS, Singapore. August 2017

Coastal environments and sea-level rise session at CERF, Providence, USA. November 2017

2<sup>nd</sup> Annual meeting, Durban, South Africa. November 2017. This will be a week-long combined conference-fieldtrip. We intend to combine with the INQUA-funded HOLSEA project to bring together a diverse group of scientists interested in coastal hazards.

**5. Project funding requested**

We request \$10,000. As with the first year, these funds will be utilized wholly to enable participants to attend meetings who are either early career, female, and/or from underrepresented nations.

**6. Request for extension, on-extended-term-status, or intention to propose successor project**

Extension is requested.

**7. Financial statement (\$ USD only)**

*The IGCP Scientific Board would like to be informed how the IGCP funds were used.*

All funds (\$8000) were used to support travel for participants at the annual meeting in Oman (see financial support form returned with meeting report form for further details of recipients).

**8. What additional funding besides the IGCP seed funding has your project obtained thanks to the IGCP label?**

The Dean of the College of Environment and Life Sciences at the University of Rhode Island has promised to match the funds received from IGCP for the remainder of the project (Years 2-5).

Funding was obtained from the Research Council of Oman that allowed for the defraying of costs at the first annual meeting. This was initially expected to be \$25,000 but the crash in oil prices resulted in frozen funds until shortly after the meeting. We are exploring the possibility with the funder to utilize the funds for future meetings outside of Oman.

The Director of State Key Laboratory of Marine Sciences, Xiamen University has promised to provide financial support for the 2019 annual meeting in Xiamen. Amounts will be finalized a year before the meeting.

**9. Attach any information you may consider relevant**