

GC Sea Level/CLIVAR-ODC Joint Summer School

Past, present and Future Sea level changes

25-30 June 2018, Qingdao-China

Summer school is aimed at Early Career Scientists (expected number 40–50 participants)

Goal: The Summer School has the objective to provide early career scientists and engineers specializing in sea level research with an update in observations, knowledge, and understanding for the study of global and regional sea level change and their impacts in coastal areas.

Scope: This Summer School will cover a wide range of physical processes contributing to global and regional sea level change: from observations to modelling of the main physical processes of global and regional sea level rise and variability. In addition, there is a specific focus on impact studies in coastal areas.

Day 1 (June 25)

| Module | Time | Activity | Name |
|--------|-------------|--|--------------------------|
| 1 | 09:00-10:00 | Opening, Introduction, Self-introduction by participants | Local organisers |
| | 10:00-10:30 | UN Decade of Ocean Science for Sustainable Development (2021-2030) | Wenxi ZHU |
| | 10:30-11:00 | Break | |
| 2 | 11:00-12:30 | Introduction to Sea Level Science | Detlef Stammer |
| | 12:30-14:00 | Lunch | |
| 3 | 14:00-15:30 | Past sea level changes. (geological scale briefly, tide gauge observations, observing systems, use of tide gauge data for climate research, use of altimeter data) | S. Jevrejeva |
| | 15:30-16:00 | break | |
| 4 | 16:00-17:30 | Modern observations. (including brief info about satellite altimetry, GRACE and others, energy budget, sea level budget components, the role of the ocean component in sea level budget) | Detlef Stammer |
| | 17:30-18:00 | Delivering Ocean Services to Meet Societal Needs: Lessons and Experiences from the SEAGOOS Ocean Forecasting System Development | Somkiat KHOKIATTIWONG |
| | 18:00 | End of activities | |

Day 2 (June 26)

| Module | Time | Activity | Name |
|---------------|-------------|---|------------------------------|
| 5 | 09:00-10:30 | Ocean observations, heat uptake, thermosphere sea level (including ocean in situ temperature, thermosteric sea level, observing systems: past, present and future, detection and attribution). Part 1 | Karina von Schuckmann |
| | 10:30-11:00 | Break | |
| 6 | 11:00-12:30 | Ocean observations, heat uptake, thermosphere sea level (including ocean in situ temperature, thermosteric sea level, observing systems: past, present and future, detection and attribution). Part 2 | Karina von Schuckmann |
| | 12:30-14:00 | Lunch | |
| 7 | 14:00-15:30 | Observed and modelled Sea level variability: Observations (including role of climate modes, role of the ocean in SL variability, time series analysis, use of statistical methods for SL studies) | Detlef Stammer |
| | 15:30-16:00 | Break | |
| 8 | 16:00-17:30 | Observed and modelled sea level variability: Modelling (including global, regional and coastal), use of altimeter data | Detlef Stammer |
| | 17:30-18:30 | Presentation by participants, group 1 | |
| | 18:30 | End of activities | |

Day 3 (June 27)

| Module | Time | Activity | Name |
|---------------|-------------|---|------------------|
| 9 | 09:00-10:30 | Vertical land movement. (GPS observations, observing systems for geophysical signals, including GIA and local subsidence, include GRACE here or in the next lecture) | Matt King |
| | 10:30-11:00 | Break | |
| 10 | 11:00-12:30 | Practical Applications: GIA model corrections to tide gauges, computing trends from individual gauges, sea-level fingerprints etc. Observed contributions from ice sheets | Matt King |
| | 12:30-14:00 | Lunch | |
| 11 | 14:00-17:30 | Visit to labs of FIO | Local organisers |
| | 17:30 | End of activities | |

Day 4 (June 28)

| Module | Time | Activity | Name |
|---------------|-------------|---|---------------------|
| 12 | 09:00-10:30 | Sea level components. Contribution from Glaciers, observations and modelling | Shiyin Liu |
| | 10:30-11:00 | Break | |
| 13 | 11:00-12:30 | Ice sheet contributions – dynamics (Formation and evolution of ice sheets, contemporary evolution of Greenland and Antarctic mass balance, processes behind observed changes in the dynamics of outlet glaciers) | Gael Durand |
| | 12:30-14:00 | Lunch | |
| 14 | 14:00-15:30 | Ice sheet contributions – modelling and projections (Brief history of ice sheet modelling, current challenges in numerical developments, projections of ice sheets' evolution) | Gael Durand |
| | 15:30-16:00 | Break | |
| 15 | 16:00-17:30 | Sea level projections. (Global & regional, local approaches, comparison with 20 th century observations/modelling; introduction to fingerprints, patterns, e.g. the role of land water, glaciers) | S. Jevrejeva |
| | 17:30-18:30 | Presentation by participants, group 2 | |
| | 18:30 | End of activities | |

Day 5 (June 29)

| Module | Time | Activity | Name |
|---------------|-------------|--|---------------------------|
| 16 | 09:00-10:30 | Projections for the 21 st century and beyond | S. Jevrejeva |
| | 10:30-11:00 | Break | |
| 17 | 11:00-12:30 | Understanding and managing coastal hazards (including flooding, erosion with references to groundwater salinization): (1) examples of impacts from current events; (2) the physical phenomena driving the hazards; (3) current management of coastal risks (prevention, preparedness, crisis management, response, adaptation) | Gonéri Le Cozannet |
| | 12:30-14:00 | Lunch | |
| 18 | 14:00-15:30 | Coastal impacts of sea level rise (shoreline changes, extreme water levels and flooding): (1) impacts from sea level rise from a global to local perspective; (2) managing uncertainties in sea level rise impact assessments; (3) evaluating the | Gonéri Le Cozannet |

| | | | |
|----|-------------|---|-----|
| | | expected benefits of adaptation and mitigation; (4) services to support adaptation in coastal areas | |
| | 15:30-16:00 | Break | |
| 19 | 16:00-17:30 | Challenges for sea level science | TBA |
| | 17:30-18:30 | Presentation by participants, group 3 | |
| | 18:30 | End of activities | |

Day 6

| Module | Time | Activity | Name |
|--------|-------------|----------------------------------|------------------|
| 20 | 09:00-10:30 | Development of new climate model | Fangli Qiao |
| | 10:30-11:00 | Break | |
| 21 | 11:00-12:30 | Closing Ceremony | Local organisers |
| | 12:30-14:00 | Lunch | |