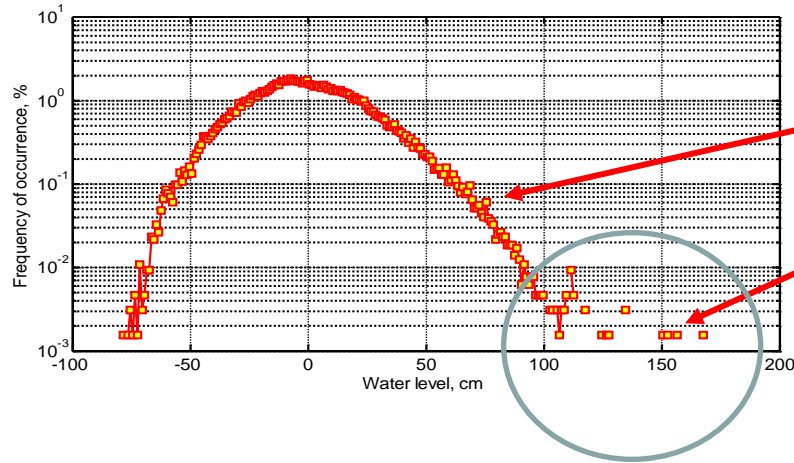


Evaluation of extreme water levels and their return periods near Tallinn using ensemble approach

Maris Eelsalu, Priidik Lagemaa, Katri Pindsoo, Tarmo Soomere

Motivation

- Water level variations: close to the normal distribution
- except for the extremely high sea level events
- different methods lead to different predictions of return periods and extreme sea levels
- a possible solution: ensemble approach
- requires evaluation of the spreading of extreme water levels



Study area

- Grid cell 2 × 2 miles at the entrance to Kopli Bay

Data

- Rossby Centre Ocean Model water level time series
- HIROMB output merged with measured water levels
 - maxima for each calendar year; maxima for each stormy season; maxima of variations driven by a single storm

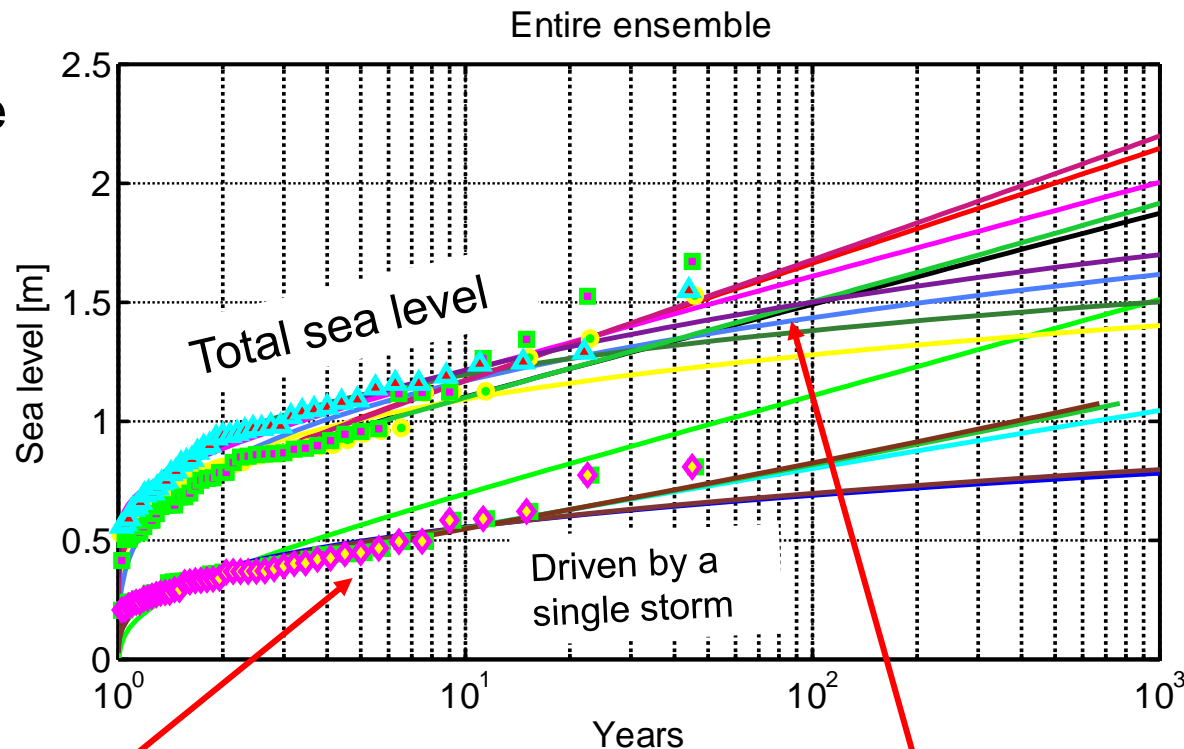


Ensemble approach has clear potential



- Nice spreading: no prediction is clearly above or below the cluster
- spreading <20cm for 20 yr return period
- 35 cm for 100 yr
- 75 cm for 500 yr

Single predictions for the storm driven component: larger spreading but ensemble approach still works



Reasonable match of the ensemble average for 1 in 100 yr event with the highest measured/hindcast water level