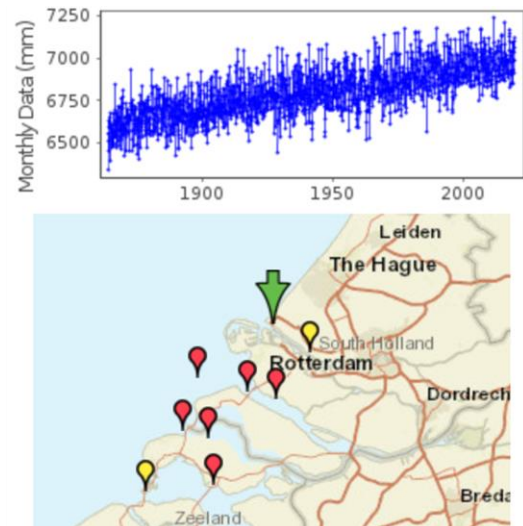


Theme: Geoscience time series analysis

Combined tide and storm surge prediction in Dutch coastline

Coastal flood risk management in general and tide and storm surge prediction in particular is of high importance in coastal areas of the Netherlands. Knowledge on sea level variations plays an important role. The disasters such as the flooding of The Netherlands and the United Kingdom in 1953, resulted in over 2,000 fatalities, was a result of combination of three factors: Spring tide, low atmospheric pressure and storm (strong winds).

The time series of the above factors, provided as the sea-level measurements (tide gauge data), atmospheric pressure and wind speed data, are available by the responsible parties. In this project, an observation-based model in which the above three factors can simultaneously contribute to the critical sea level height prediction needs to be developed. Such a model will benefit from the theories of estimation and prediction formulated in the framework of the least squares method. The formulation should be implemented in a scientific computing software like Matlab or Python. The main tidal constituents, and their interactions with wind speed and atmospheric pressure, will be determined and used in a prediction model. The sea level height will then be predicted using the estimated tidal constituents in a deterministic manner and the predicted atmospheric parameters (wind and pressure), which can be available by meteorological organizations. The results will then be compared with the available tide gauge data and the hydrological models.



Information:

- Dr. ir. Alireza Amiri-Simkoei
- Email: a.amirisimkoei@tudelft.nl
- Room 2.29