DOCTORAL CANDIDATE:	Peygham Ghaffari Nooran
DEGREE:	Philosophiae Doctor
FACULTY:	Faculty of Mathematics and Natural Sciences
DEPARTMENT:	
AREA OF EXPERTISE:	
SUPERVISORS:	Jan Erik H. Weber and Joseph H. LaCasce
DATE OF DISPUTATION:	26th of March 2014

DISSERTATION TITLE: *Wind and wave-induced currents over sloping bottom topography, with application to the Caspian Sea*

The Caspian sea is the largest lake at Earth, 28 meters under sea level and with very special topographic conditions. In the north of the lake the depth is only 5-6 meters, increasing to 190 meters in the middle and in the south the depth goes down to 1000 meters. The focus in this doctoral study has been to investigate the topographic effect on wind-driven current variability as well as the mean currents due to topographically trapped waves. The wind driven current and waves transports of water are interesting from a fluid dynamics point of view, but they also have practical implications.

Topographic changes in the ocean are often strongest close to the coasts or the shore line. Therefore topographically steered currents may advect effluents and pollution along coasts and beaches and thereby pose a threat to the coastal population. Furthermore, for small bottom sediments in suspension, the wave-induced mean drift may contribute to beach erosion by relocating bottom material. The mean drift velocity in progressive waves is not easy to observe using fixed point measurement. It is partly due to the nature of the waves, but also due to the small amplitudes which are easily masked by other dynamics, e.g. tidal and inertial currents. It is therefore not straightforward to decompose the wave drift from the other dynamics. In this respect, the Caspian Sea as a tide-free, closed body of water seems a promising place for such experiments. This large lake can be regarded as prototype laboratory, particularly during calm wind episodes.