

The University of Queensland - IIT Delhi Academy of Research Joint PhD Project

PROJECT TITLE	DEVELOPMENT OF PROBABILISTIC FORECASTING SYSTEM FOR STORM SURGES AND ASSOCIATED COASTAL INUNDATION.
PROJECT CODE	UQIDAR 00138
PROJECT DESCRIPTION	<p>India and Australia are frequently affected by coastal flooding due to storm surges generated by tropical cyclones, which has a significant impact on human life and property. Like any deterministic forecast, prediction of storm surges and associated coastal inundation have also an associate uncertainty. The major source of uncertainty lies in the forecast of any cyclone track and associated intensity at any lead time by various atmospheric models. This will be done by several forecasts provided by the concerned Meteorological agencies, using slightly different initial conditions, boundary conditions and/or model physics. These runs will be utilized to generate ensemble forecasting of storm surges and coastal inundation using the ADCIRC model.</p> <p>Broad objectives: (1) Use of ensemble techniques to produce quantitative estimates of uncertainty and risk due to storm surges along the coastal regions (2) Development of ensemble storm surge and associated inland inundation prediction system for the tropical cyclones crossing the coast. (3) Evaluation procedure involves consideration of RMS error of various single forecasts and how well the ensemble captures variations in this error.</p>
PROJECT OUTCOMES	<p>After demonstration of the ensemble prediction system for storm surges and associated coastal inundation, it can be used for operational purpose by the respective Meteorological offices for better estimates of the risk of damaging events given the forecast uncertainties, which are sampled by the ensemble. This will enable better planning of emergency response and disaster management, and improved risk estimates to quantify future planning of infrastructure while accounting for possible climate change impacts.</p>
ADVISORY TEAM	<p>Professor Tom Baldock http://researchers.uq.edu.au/researcher/1154 t.baldock@uq.edu.au School of Civil Engineering The University of Queensland</p> <p>Professor A D Rao http://web.iitd.ac.in/~adrao/ adrao@cas.iitd.ac.in Department of Atmospheric Sciences Indian Institute of Technology Delhi</p>
TYPE OF STUDENT	<p>Applications are open to i/a students who meet eligibility criteria.</p> <p>note: i-students must have own scholarship to apply (CSIR, UCG-NET, etc)</p>
DISCIPLINE BACKGROUND OF STUDENT	<p>Ideally, this project requires students with a background in numerical methods, probabilistic approach, tropical cyclones, storm surges.</p>
IDEAL CANDIDATE	<p>Essential capabilities:</p> <ul style="list-style-type: none"> Numerical methods and fluid dynamics

APPLICATION
PROCESS

Desirable capabilities:

- Numerical modelling techniques, statistical methods, knowledge of computational fluid dynamics

Expected qualifications (courses, degrees, etc):

- Post graduation in oceanography/meteorology/atmospheric sciences or Engineering graduates in civil/mechanical engineering.

Apply online by the due date: <https://www.uqidar.org/students/how-to-apply/>