Project 2 Title: Groundwater Salinity Monitoring System

Sponsor: International Cholera and Diarrhoeal Disease Research, Bangladesh (icddr,b)
(recipient of the inaugural Gates Award for Global Health, 2001)

Background:

Our sponsor has been monitoring the impacts of climate change on local health in the coastal areas of Bangladesh for over a decade. Research has concluded that "those living in the coastal area had a significantly higher probability of high salt intake compared with people … who lived in hilly areas," leading to high blood pressure [1] and that "increasing salt intake … might contribute to the seasonal pattern of hypertension in pregnancy in coastal Bangladesh … associated with increased rates of adverse maternal and fetal outcomes" [2]. A more comprehensive survey of the salinity of groundwater, which is the dominant source of drinking water in coastal Bangladesh, is therefore essential.

Project Purpose:

To design and prototype a groundwater salinity measurement and monitoring system for deployment in the health survey areas of coastal Bangladesh.

Project Requirements:

- Design of mechanical packaging that
  - incorporates commercial-off-the-shelf (COTS) salinity sensor, and
  - would be incorporated to daily groundwater (tube) well operation
- Design of remote monitoring functionalities – automated field data acquisition and transmission
- Low-cost (to allow widespread deployment)

Design Team Composition:

- An even mix of ECE and ME students.
- We look for students interested in working with international development agencies on global sustainable development issues.
- All team members must be able to communicate effectively in English in written, oral, and graphical formats.
- It would be desirable for the team members to have knowledge of and interest in South Asian languages and culture.
- Website development and multimedia production skills are a plus.

[1] Rasheed et al. BMC Public Health 2014, 14:584

[2] Khan et al. Environ Health Perspect 2011, 119:1328–1332