Internship: Modeling of Relative Sea Level history in the Ganges Delta since the Last Glacial Maximum

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Location of the internship, La Rochelle University:

LIENSs (UMR 7266 CNRS- La Rochelle University)

Description:

With approximately 150 million people living less than 5 meters above mean sea level [1], the Ganges Delta is particularly vulnerable to coastal erosion. Constraining coastal erosion hazards in large delta plains such as the Ganges Delta required considering the effect of sediment loading on the relative sea level (RSL, i.e the complex balance in between the moving sea and land). As an example, sediment isostasy induced by sedimentation since the Last Glacial Maximum (LGM, 18.5-22 kyr) may induce about 0.6 mm/yr of subsidence at present in the Irrawaddy Delta ([2]).

In the Ganges Delta subsidence induces by sediment isostasy since the LGM may be today 1.5 - 3 mm/year, i.e. close to absolute sea level change in the region ([[3, 4]).These estimations are using PREM earth model, which is very different from the rheology of the earth's near the GBMD [5]. In addition, recent observations in the GBMD have provided a more accurate sedimentation history ([6, 7]).

During this internship, we propose that the student work on the development of an earth model suitable for the GBMD delta. This will be achieve by integrating new unedited observation of the earth's structure obtained by passive tomography in the Ganges delta (US-NSF EAR 17-14892 project). The student will solve the sea level equation in the Ganges Delta using a recently developed python code that solves the sea level equation on online clusters (CURTA, OASU facility). This resolution involves developing a new earth's model and include tunrkey stratigraphic reconstruction of the Ganges Delta ([6, 7]). The workflow followed the solution proposed by [8] and has already been developed and has been tested in Irrawaddy delta [2].

With the target on doing educational opportunities at University fully inclusive and fighting against all discriminations, a particular attention will be made to make the working space safe and comfortable for everybody.

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