



Internship at CNRS LIENSs - La Rochelle University

(6 months)

Title: *Sediment-driven vertical land movement and relative sea-level changes in the Ayeyarwady delta*

Duration of Internship: *January - June 2022 (6 months)*

Supervisors: *M. Karpytchev, Assoc.-Prof., La Rochelle University, M. Becker, Dir. Research, CNRS*

Project: ANR DELTA - Deltas undEr gLobal impacT of chAnge ([ANR-17-CE03-0001](https://anr.fr/ANR-17-CE03-0001))

Pronounced land subsidence in the deltaic areas make them extremely susceptible to the ongoing climate-driven sea-level rise. Drivers of land subsidence in deltas are diverse and multiple: they originate both from natural processes as well as from human activities and operate over broad range of time- and space scales. Obviously, evaluation of relative contribution of the processes inducing land subsidence can help in understanding the deltas evolution but it is also necessary for predicting the flooding risks and vulnerability of delta populations in the future.

Around 15 million people live in the Ayeyarwady (Irrawaddy) delta in Myanmar, facing sea level rise and major extreme climatic events (cyclone Nargis 2008, among others). However, despite being one of the Asian megadeltas, this delta has received little attention from the scientific community. Today, a substantial lack of knowledge on details of the processes which had formed the Ayeyarwady in the past sets up a barrier for understanding and forecasting its future.

This study focuses on estimating the rates of subsidence induced by the Holocene sediment deposition in the Ayeyarwady delta. Based on the published recent analysis of drill cores and reconstruction of sediment deposition patterns, we expect that the sediment deposited in the Ayeyarwady delta over the past thousands of years contributes significantly to the current delta land movement. Evaluation of (1) the vertical land movement in the Ayeyarwady delta as well as of (2) the relative sea level along its coasts is a main goal of the proposed internship. More details on the methodology to be used can be found – in Ivins et al., (2007) and Karpytchev et al. (2018).

The principle steps to be taken by the Master candidate:

- Assembling data on the Holocene sediment deposition in the Ayeyarwady delta from published literature
- Constructing sediment deposition models (spatial-temporal patterns of sediment accumulation)
- Estimating vertical land movement rates induced by the Holocene sediment loading
- Estimating the relative sea level rise along the coast of the Ayeyarwady delta

Scientific environment: The Master candidate will work at Coastal Studies Laboratory LIENSs (Laboratory Littoral ENvironnement et Sociétés <https://lienss.univ-larochelle.fr/?lang=en>) in La Rochelle (France). The internship makes a part of the ANR project DELTA (*Deltas undEr gLobal impacT of chAnge*).

Profile & Requested skills: we look for a Master student with a strong background in natural sciences and skilled in environmental/Earth sciences, data analysis and programming

Allowance: Internship allowance of about 590E/month will be provided.

Contact: M. Karpytchev: mikhail.karpytchev@univ-lr.fr , M. Becker melanie.becker@univ-lr.fr,

Tel.: 33 5 46 45 72 06 / 05 46 45 72 06

References:

- Ivins, E. R., Dokka, R. K., & Blom, R. G. (2007). *Post-glacial sediment load and subsidence in coastal Louisiana*. Geophys. Res. Lett., 34, L16303.
- Karpytchev, M., Ballu, V., Krien, Y., Becker, M., Goodbred, S., Spada, G., Calmant, S., Shum, C.K., Khan, Z. (2018). *Contributions of a strengthened early Holocene monsoon and sediment loading to present-day subsidence of the Ganges-Brahmaputra Delta*. Geophys. Res. Lett., 45, 1433–1442.