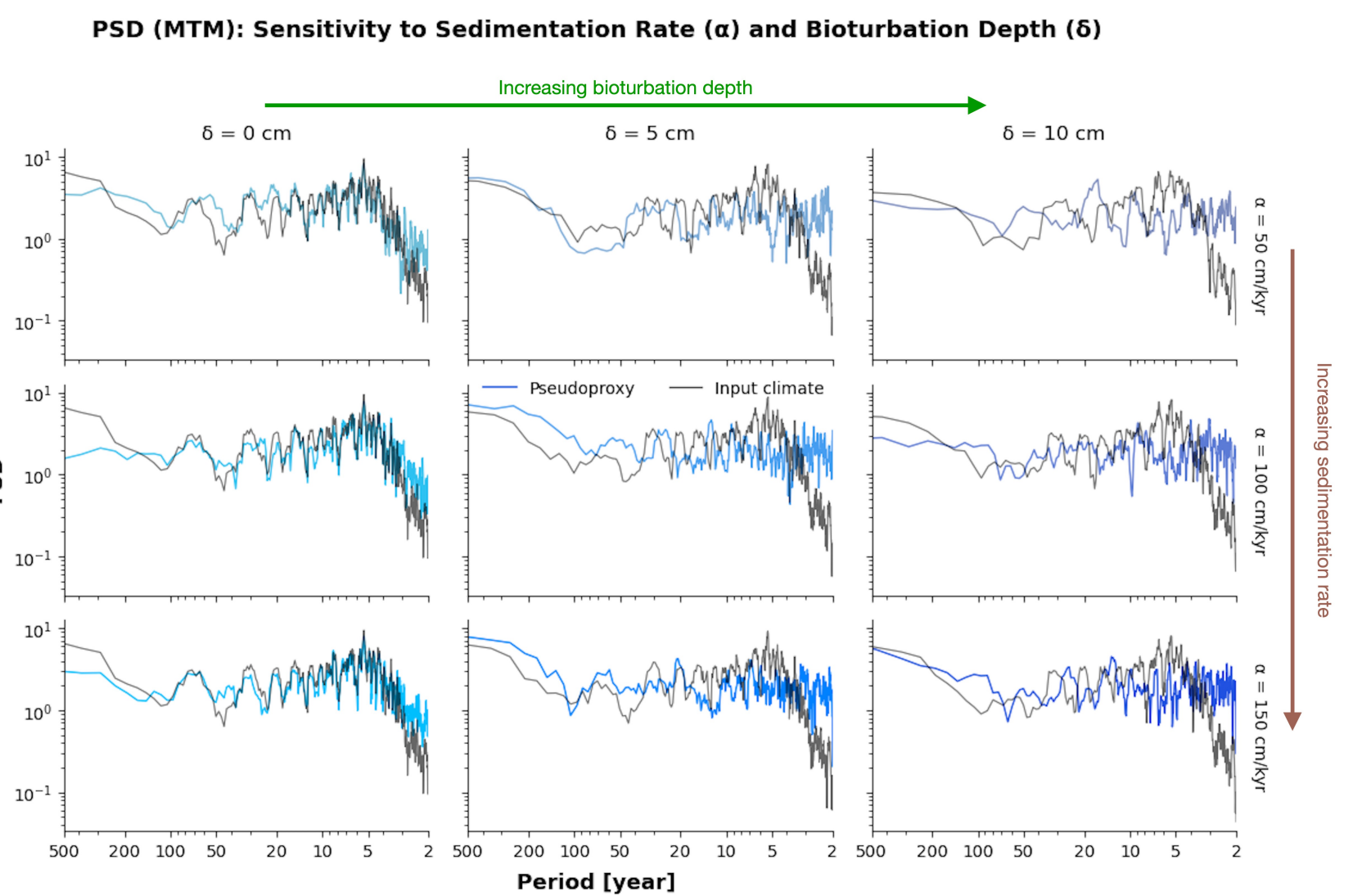
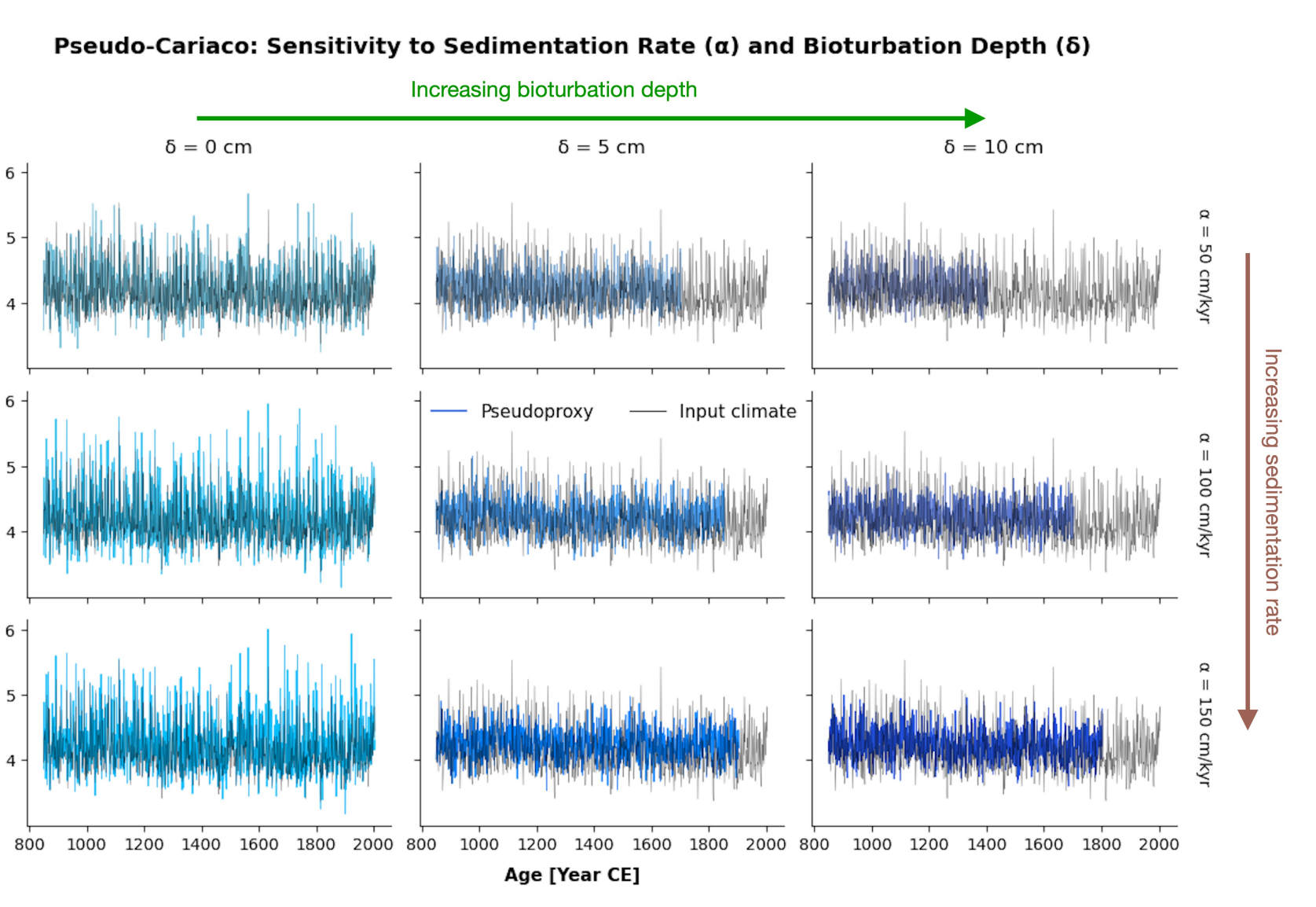
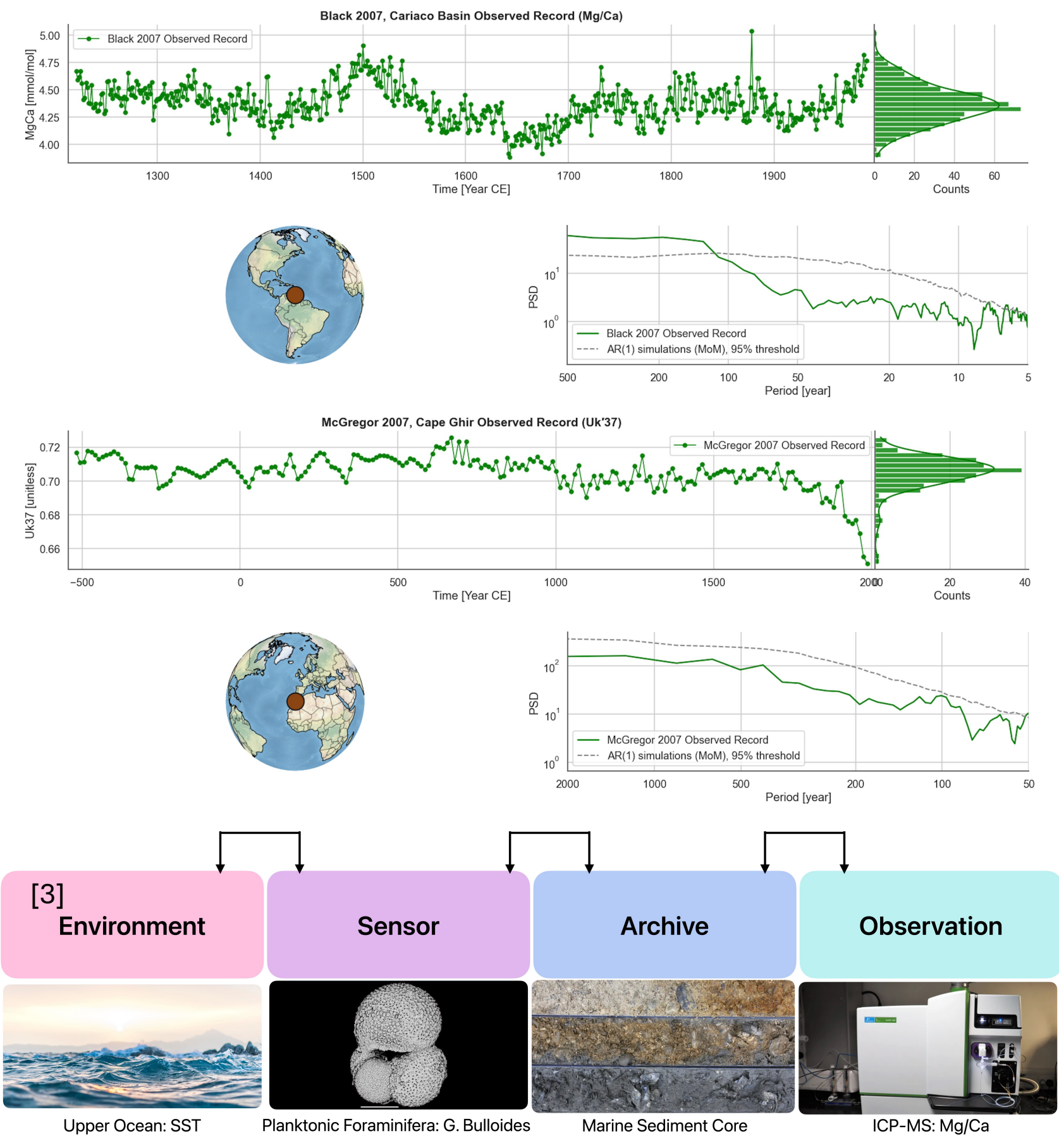
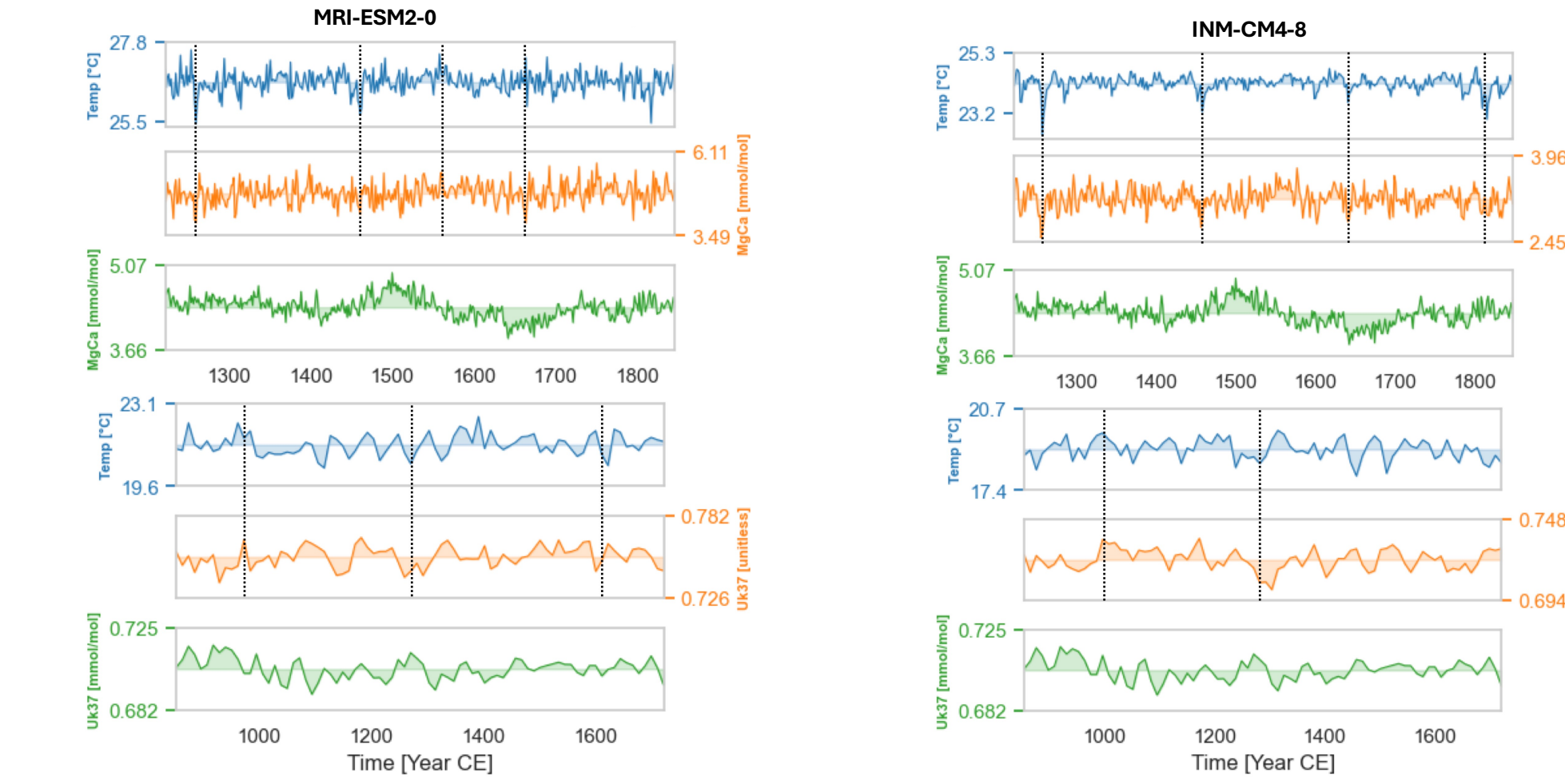
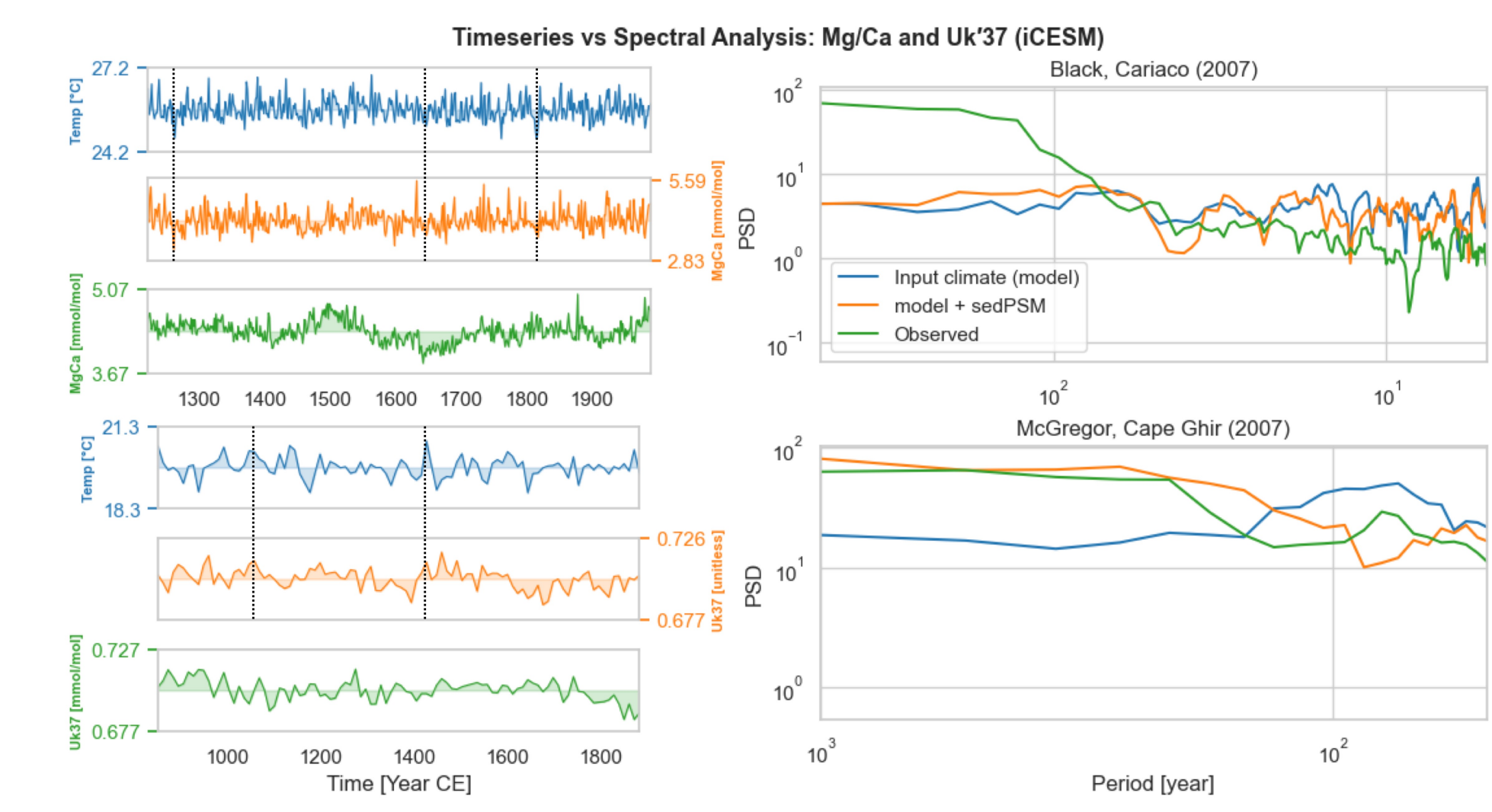
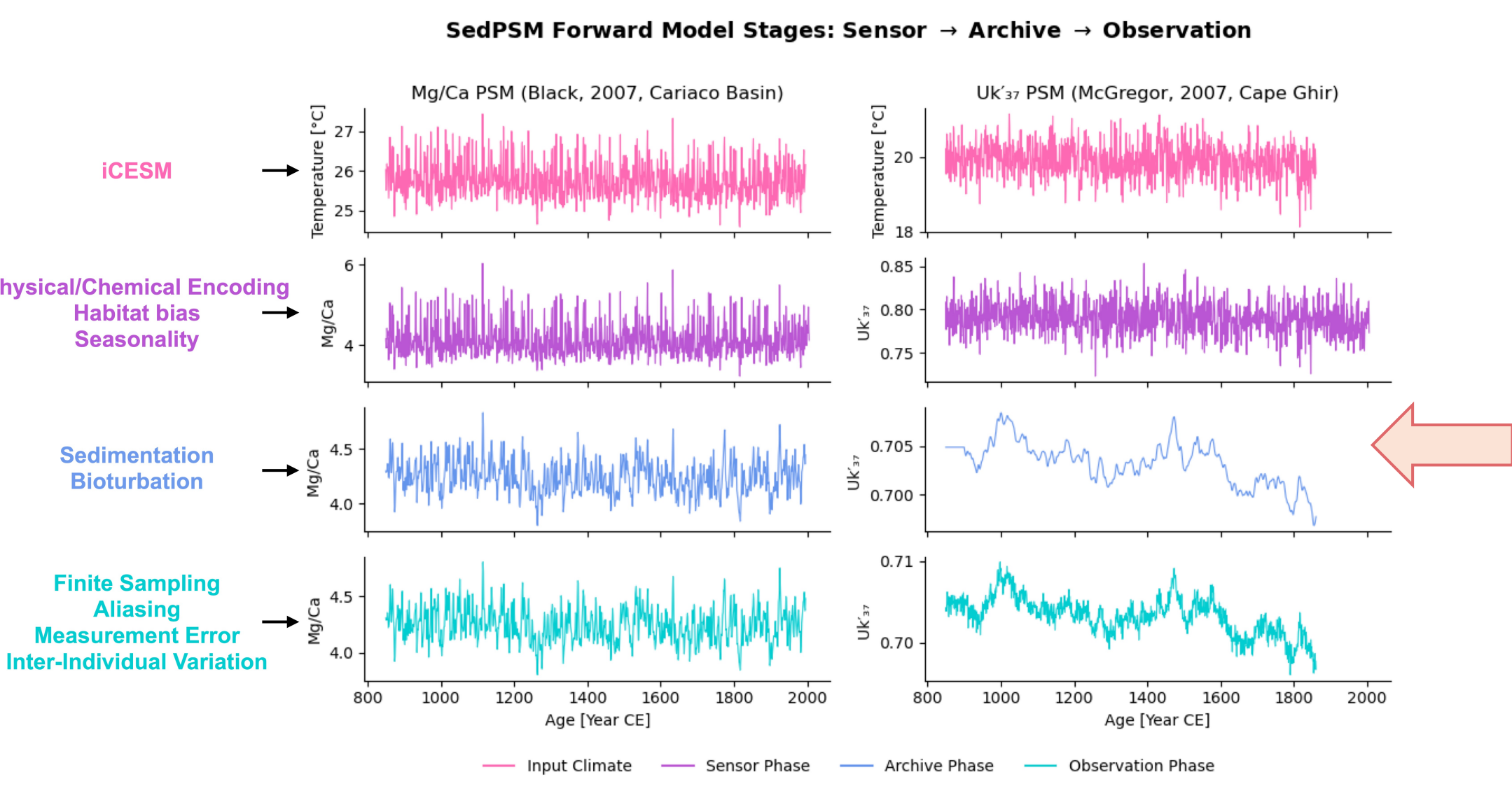


Introduction

Marine sediments record past ocean conditions but distort the original climate signal through post-depositional processes. We present *sedPSM*, a Python framework based on *sedproxy* [6] that simulates these processes to generate realistic pseudoproxies. Our sensitivity tests focus on the archive model, exploring how bioturbation and sedimentation affect signal preservation. Using three forced GCM simulations of the past millennium (CMIP6 MRI-ESM2-0 [8], CMIP6 INM-CN4-8 [2], iCESM [7]) and two sites (Cariaco Basin [1], Cape Ghir [4]), we evaluate how input climate and archive parameters influence phase and amplitude of the signal.



- Upcoming Work**
- Align code structure with PSM (Sensor, Archive, Observation)
 - Test framework on additional high-resolution records to assess spatial coherence
 - Expand modeled observations: add $\delta^{18}\text{O}$ and TEX86 records
 - Integrate Bayesian calibrations
 - Model age uncertainties: Account for radiocarbon dating error and bioturbation effects on age models
 - Use *sedPSM* to assimilate Ocean2k [5] datasets

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