

U12B-03 Plate Tectonic Reconstructions: GPlates, GMT, Python, and the Path Ahead (Invited)



Monday, 9 December 2024



10:45 - 10:55



Ballroom A (Convention Center)

Abstract

For more than a decade, users have been able to interrogate and visualize plate tectonic reconstructions within the open-source and interactive desktop software GPlates, as well as export compatible files for further analysis and/or creating publication-quality figures with Generic Mapping Tools (GMT). The long-standing synergy between GPlates and GMT has been immensely beneficial in facilitating spatio-temporal data analysis and led to significant innovations within Earth sciences, such as in plate tectonics and mantle dynamics. We will showcase this long-standing relationship between GPlates and GMT and highlight some of these applications, including plate tectonic reconstructions combined with paleo-oceanic age grid generation and animations.

Advances in recent years and the wider adoption of the Python programming language in Earth sciences has led to the development of the Python interface of GPlates—pyGPlates—as well as the newer package GPlately, which is a simplified and streamlined pyGPlates interface allowing for easier analysis, exploration, and plotting of plate tectonic reconstructions. A major advantage of moving towards the programming-interface of pyGPlates and GPlately over the desktop application is that it facilitates the interrogation and analysis of plate tectonic models and associated data, especially across numerous plate motion models and/or time steps that would otherwise be cumbersome or impossible with the desktop software. However, perhaps unbeknownst to users, some workflows using pyGPlates leverage the power of GMT ‘under the hood’. We will further highlight the current integrations and future plans between pyGPlates, GPlately, GMT and pyGMT, as well as how GMT and pyGMT can and has simplified workflows in the interrogation and advanced visualization of data and models from (py)GPlates and GPlately.

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