# Abstract

## Organic Enrichment in Time and Space

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A wide variety of factors influence the TOC content of sedimentary rocks but the organic richness ultimately relates to the interplay of organic matter production, dilution and preservation. Latitude has an important control on these three processes (e.g. influencing zones of upwelling, the location of oxygen minimum zones and regions of low precipitation and hence sediment flux) but other factors play an important role. Organic enrichment also varies temporally and it is well established that source rocks are more prevalent during certain stratigraphic intervals (such as the Silurian, Late Devonian, Late Jurassic and mid-Cretaceous) and specific events (such as the Toarcian and Turonian Oceanic Anoxic Events). This poses an interesting question: how much has latitude influenced the formation of organic-rich sediments and how has this evolved through time?

We have developed a unique eustatic model which allows the precise mapping of facies in time and space. This process is augmented by an extensive suite of biostratigraphic calibration schemes that allow detailed correlations to be made between strata deposited in high and low latitudes. Here we will utilise our global organic geochemistry database and plate tectonic model, both of which are coded to a high temporal precision using our sequence stratigraphic model, to explore the latitudinal trends on organic enrichment through the Phanerozoic. Latitudinal trends will be explored in the context of our compilation of temporally precise palinspastic paleogeographic maps and the results of a fully coupled ocean atmosphere general circulation model. We will use this information to explore the paradigms for organic enrichment through time and highlight latitudinal belts which appear under-represented in our observational dataset. The impacts for petroleum exploration will be discussed.