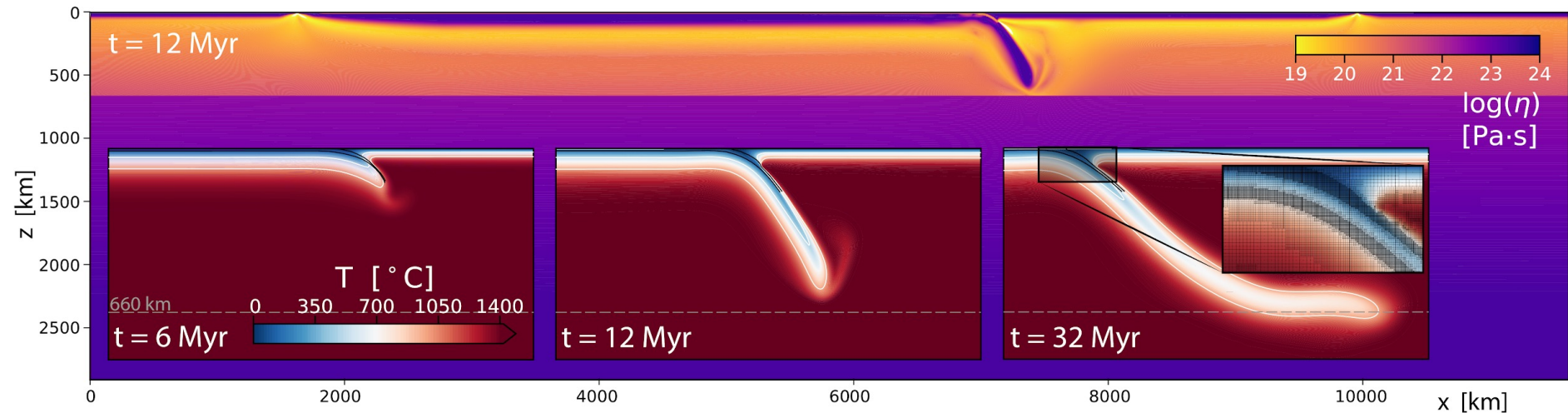


Slab bending and hydration of the associated faults: How much water is dragged down into the mantle?

The primary flux of water into the Earth's mantle occurs via the downwards transport of hydrous minerals in the slab. Constraining much hydration occurs, and hence how much water is fluxed, is needed to constrain the physical and chemical properties of the upper mantle.

To address this, we will model slab bending, and the associated faulting and hydration, using dynamic subduction models. We will ground truth these models using earthquake locations, observed faulting patterns, and rock record constraints, to produce time-dependent estimates of down-going water flux for Earth's entire range of subduction zones.



A time-dependent and dynamic subduction model from Holt and Condit (2021, G-cubed). The main panel shows the model viscosity at an intermediate time-step; lower panels display the thermal evolution (and high-resolution mesh).