

1 **Supplementary Information**

2 Special Topics: New Discovery of the South China Sea Ocean Drilling

3 **Mantle upwelling beneath the South China Sea and links to**
4 **surrounding subduction systems**

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15 Note: This document contains the following supplementary data:

16 (1) Supplementary Figure 1.

17 (2) Supplementary Figure 2.

18 (3) Supplementary Figure 3.

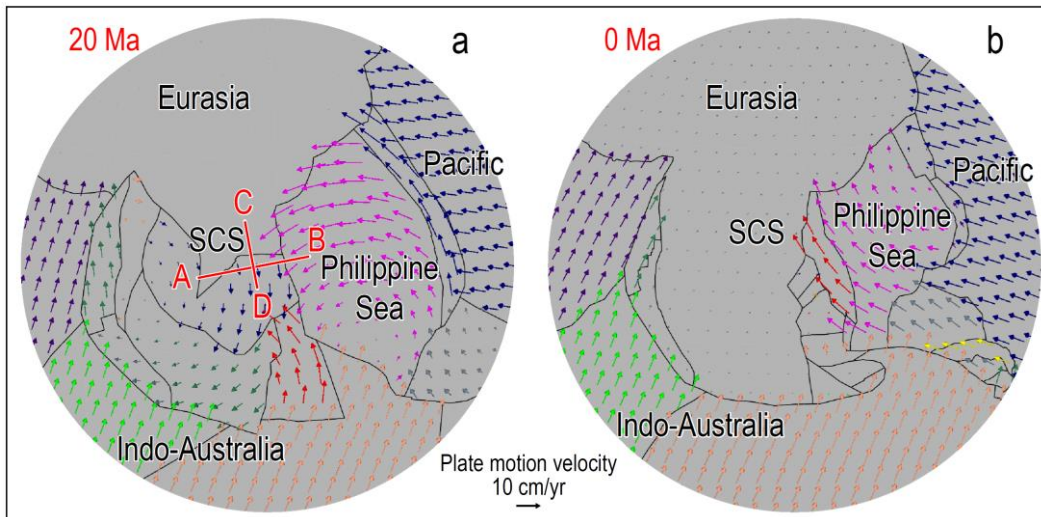
19 (4) Supplementary Movie1.

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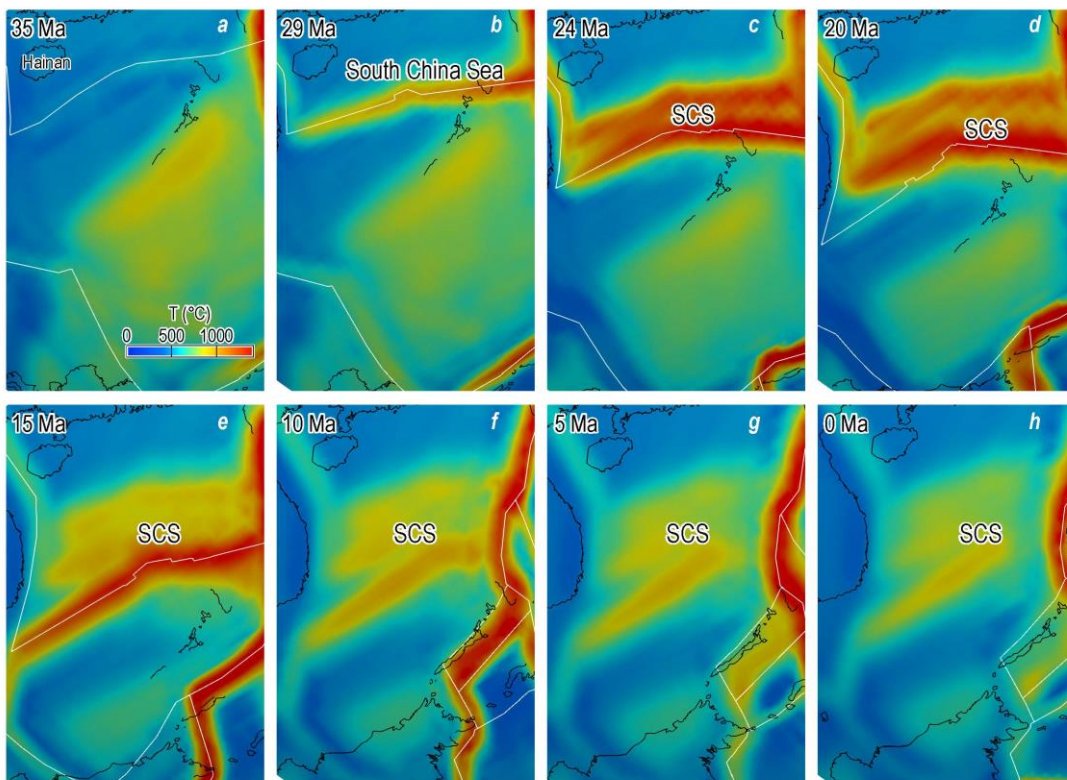
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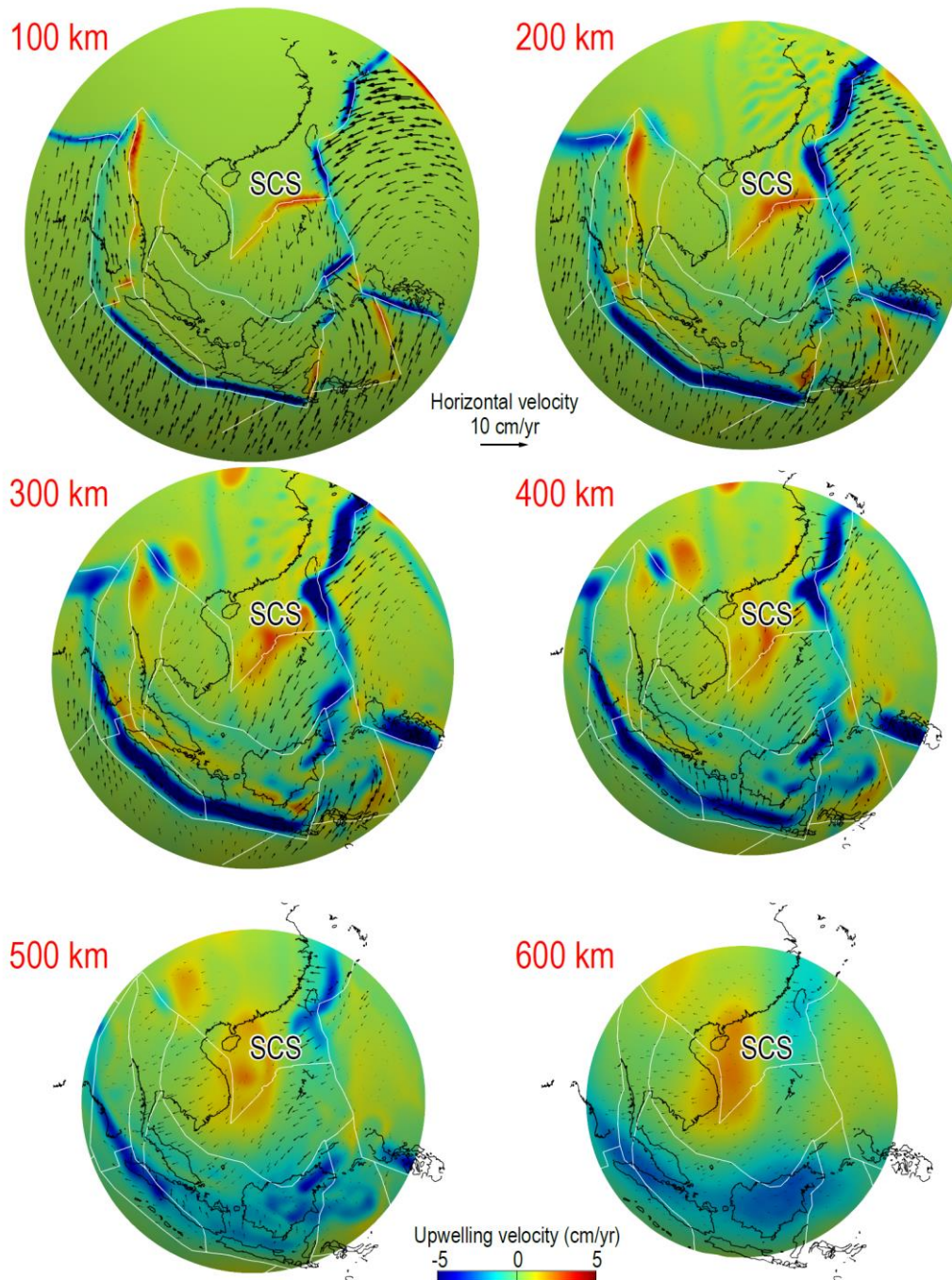
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25 **Supplementary Figure 1.** Velocity vectors of the surface plates relative to a
 26 moving hotspot reference frame at 20 Ma (a) and present (b). The velocity
 27 solutions were obtained from GPlates and used as surface boundary conditions in
 28 ASPECT modeling of the 3D mantle flow.



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30 **Supplementary Figure 2.** Calculated mantle temperature at a depth of 50 km from
 31 35 Ma to present.



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33 **Supplementary Figure 3.** Calculated mantle upwelling velocity at the depths of 100
 34 to 600 km beneath the study area at 20 Ma. Black arrows show calculated horizontal
 35 velocities at corresponding depths relative to a moving hotspot reference frame.
 36 Black and white curves indicate coastlines and plate boundaries, respectively.

37 **Supplementary Movie1.** Calculated mantle temperature at depth of 50 km from 100
 38 Ma to present.