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BIOCHAR BENEFITS
Not so straightforward

MARTIAN ATMOSPHERE
Thin when ancient water flowed

ANCIENT CARBON RELEASE
Pumped to the deep ocean

**Subduction fluids
and the deep carbon cycle**

**COVER IMAGE**

The balance between carbonate subduction into the deep Earth and CO₂ release through degassing at volcanoes is critical for the carbon cycle. Geochemical analyses of an exhumed subduction zone complex in Greece show that fluid-mediated reactions could liberate significant amounts of carbon from the subducting slab for later release at arc volcanoes. The image shows crystals of epidote, several millimetres in length, in cross-polarized light. The crystals are from a quartz vein on Tinos island, Greece, that facilitated fluid infiltration and carbonate mineral dissolution. Letter p355; News & Views p333

IMAGE: JAY J. AGUE

COVER DESIGN: DAVID SHAND

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Not so straightforward
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Martian atmosphere
Thin when ancient water flowed
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Ancient carbon release
Pumped to the deep ocean
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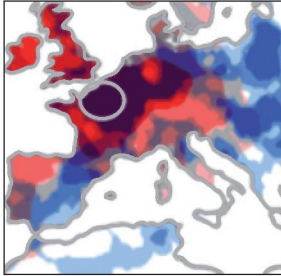
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355 Carbon dioxide released from subduction zones by fluid-mediated reactions

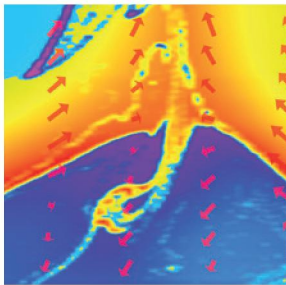
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Extreme heatwave events are expected to become increasingly common as a consequence of climate change. Analyses of the 2003 and 2010 mega-heatwaves in Europe suggest that atmospheric boundary-layer dynamics and feedbacks with the drying land surface lead to the build-up of heat in the atmosphere and extremely hot temperatures. Letter p345; News & Views p332



Lavas erupted at ocean island hotspots have complex geochemical signatures. Numerical simulations suggest that this complexity may result from the mixing of subducted oceanic crust with reservoirs of more primitive material in the deep mantle, with the resulting mixture entrained into rising mantle plumes. Letter p366; News & Views p330

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