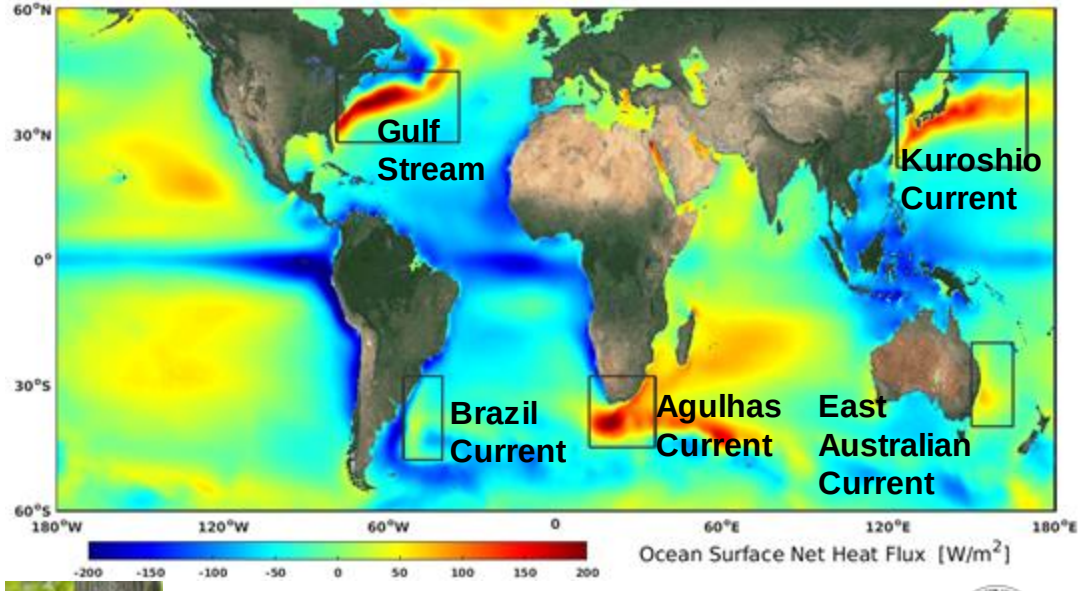
***"Multidecadal variability of the strength and position of western boundary currents and short records from direct observations obscure the detection of any long-term trends"***

*–IPCC AR6 WGI Synthesis Report*




**Subtropical western boundary currents:**

- Transport heat, moisture, gases from the equatorial regions to higher latitudes
- High biodiversity and high productivity
- Paths are followed by hurricanes/ typhoons
- Impact local to regional climate and weather dynamics

**Adriane R. Lam**
Assistant Professor, Binghamton University
Co-Founder & Co-President, Time Scavengers Inc.

BINGHAMTON UNIVERSITY
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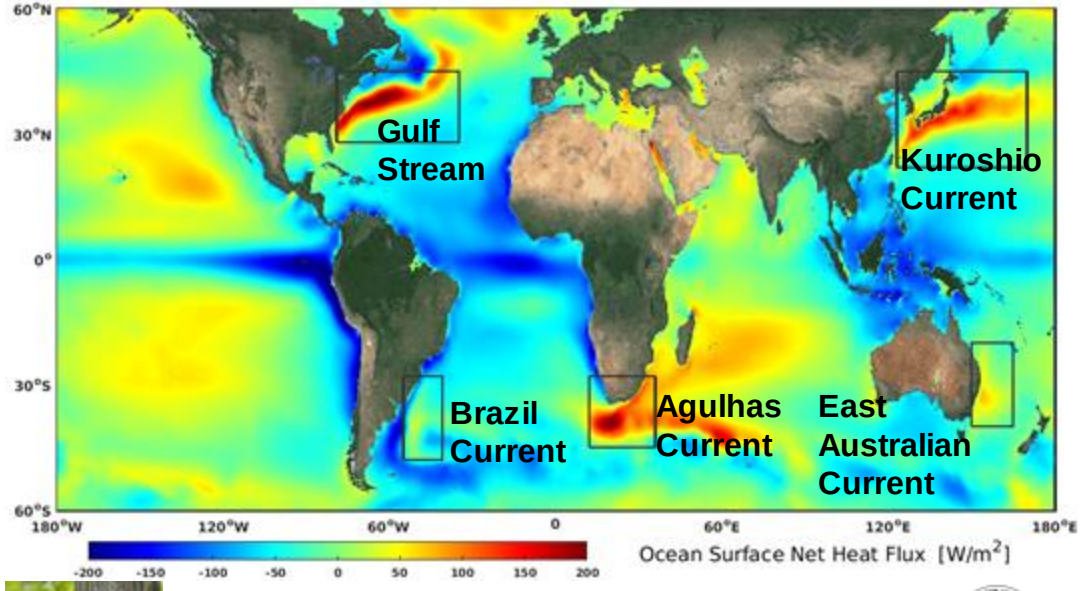


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How will they continue to respond to climate change? What will their impact on climate and biodiversity be? **We need to reconstruct WBCs using the deep-sea sediment and fossil record**

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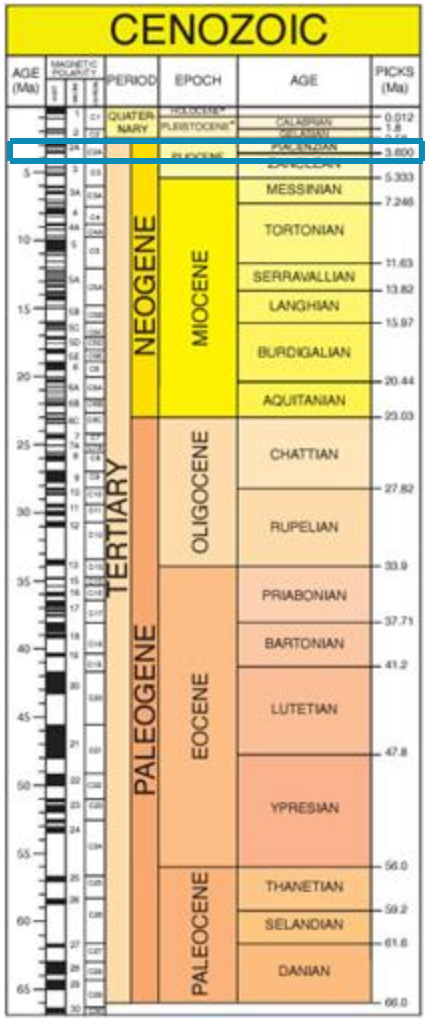
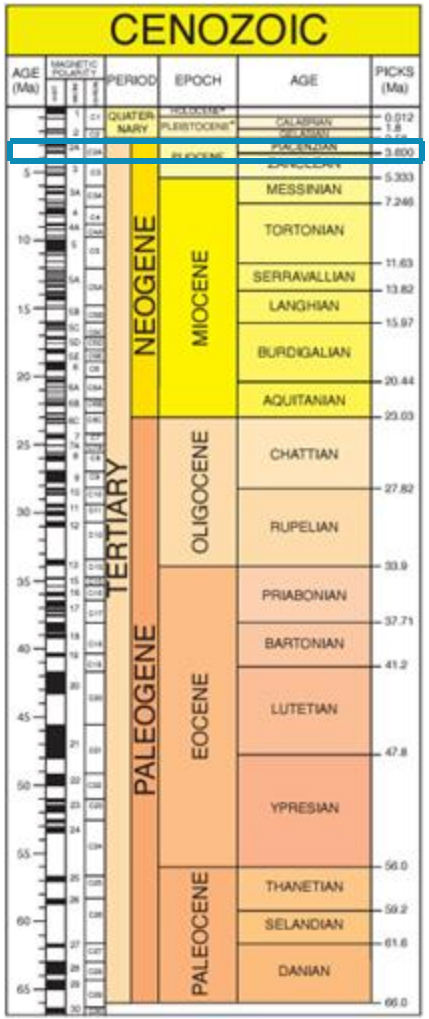



Geological Society of America,
Geologic Time Scale v. 6.0

**Analogous warm period:**
**mid-Piacenzian Warm Period,**
**3.3–3.0 million years ago**

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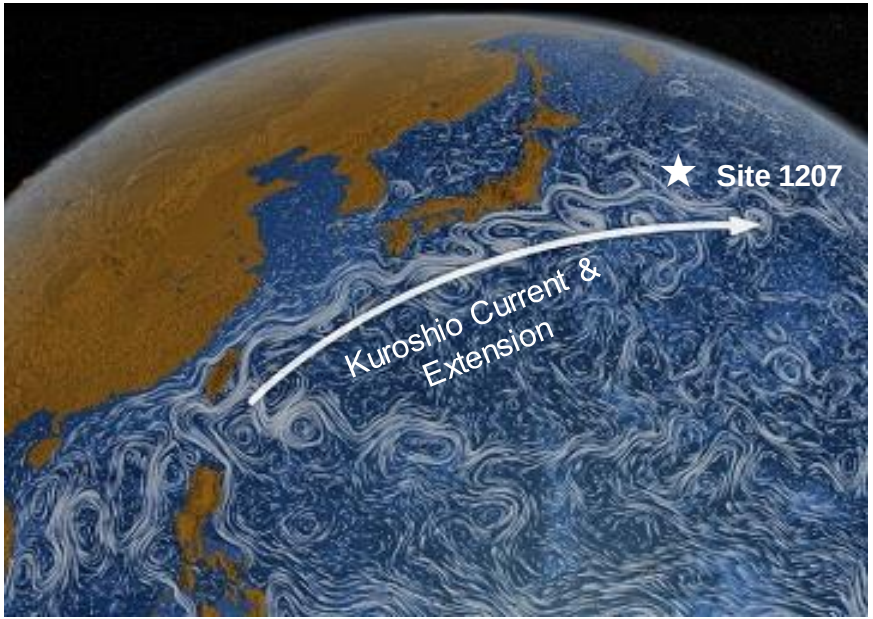

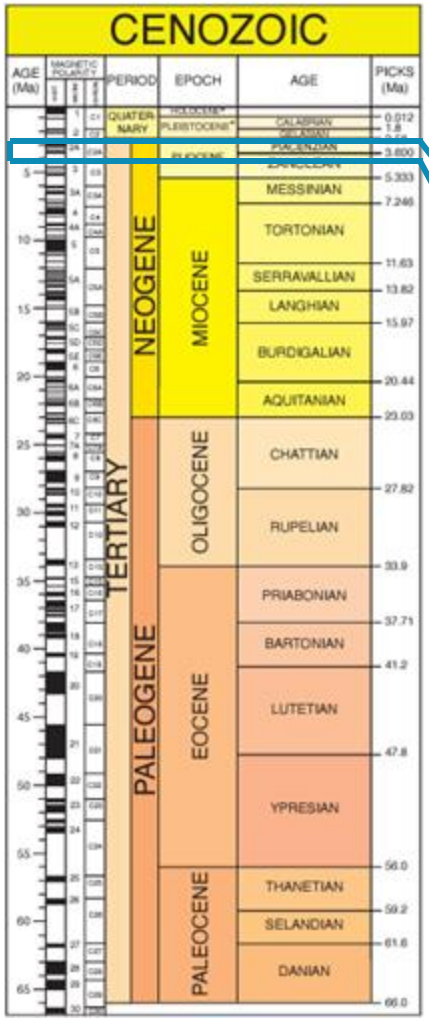


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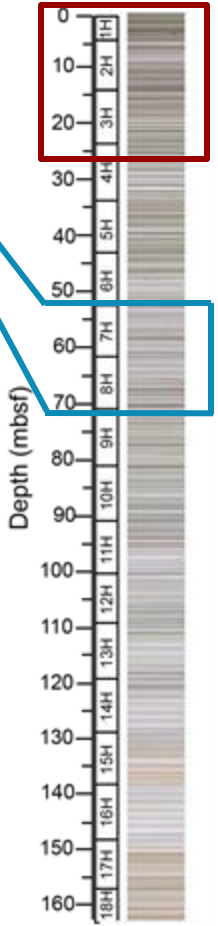
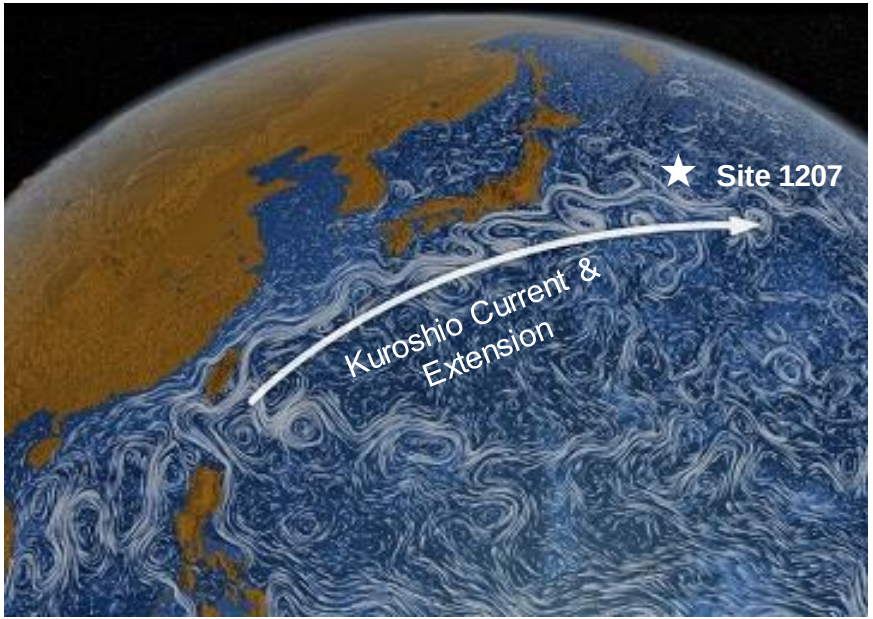


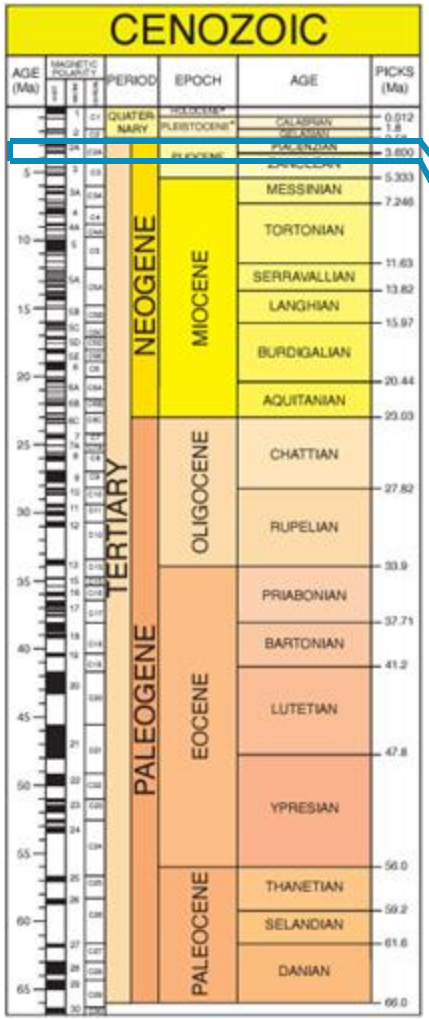

**Site 1207 Sediment Core**

Limit of a piston core (~90 ft, 27 m) at this site

Depth of analogous warm period ~3.0 million years ago




Kuroshio Current warmed by 1–2°C over last century.

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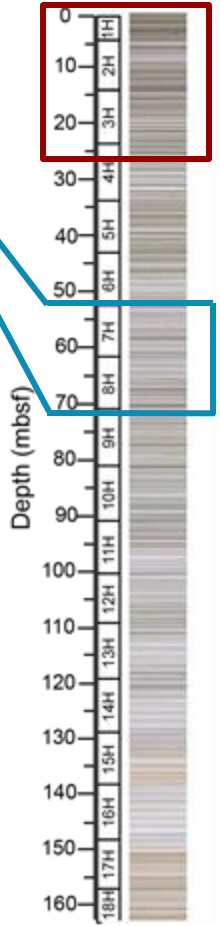


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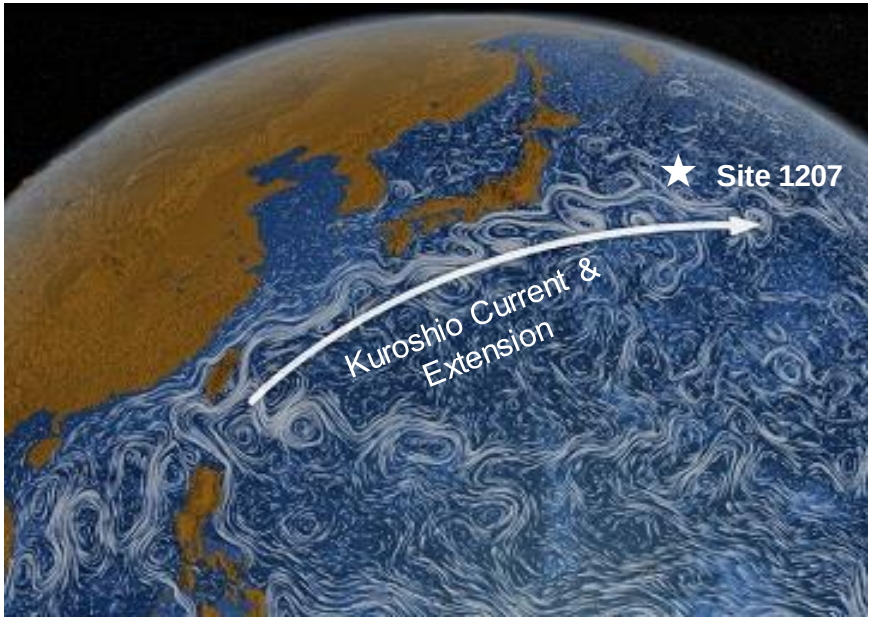
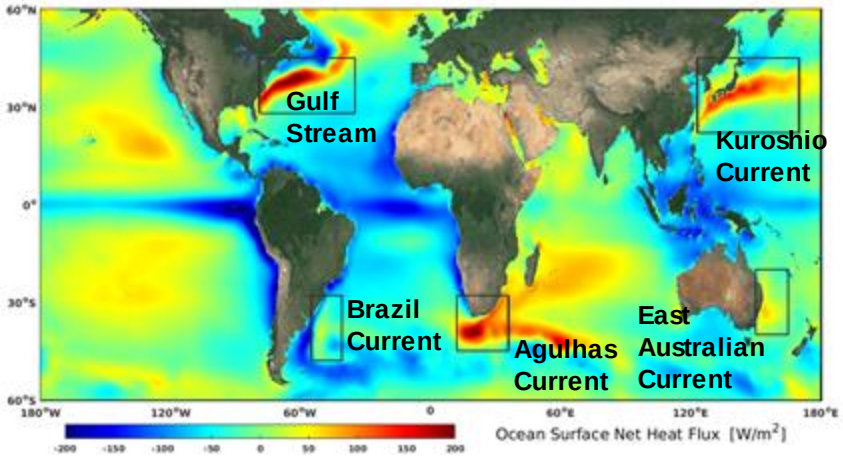


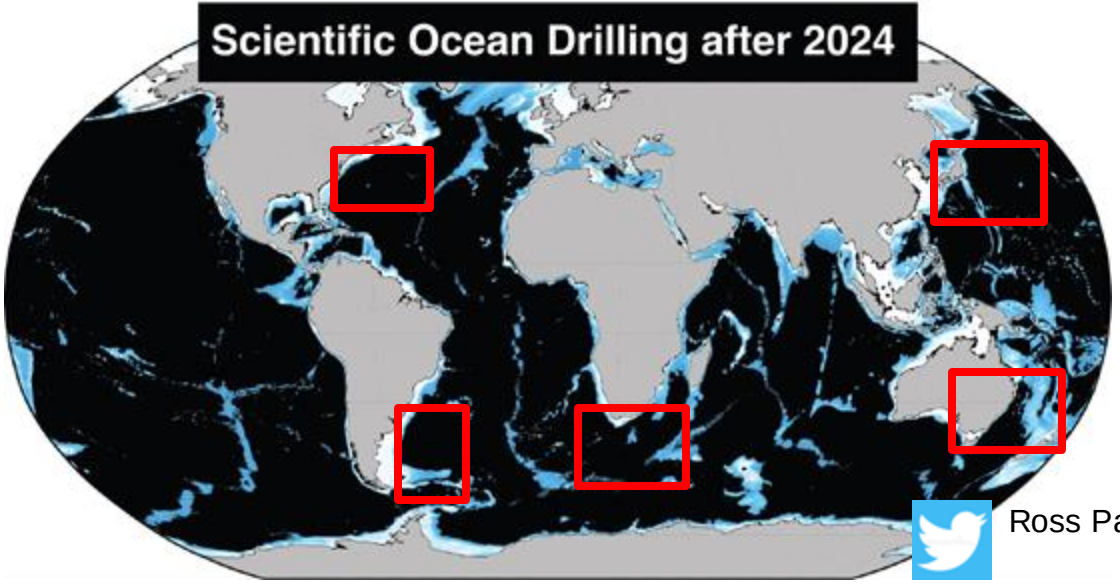

Kuroshio Current warmed by 1–2°C over last century.

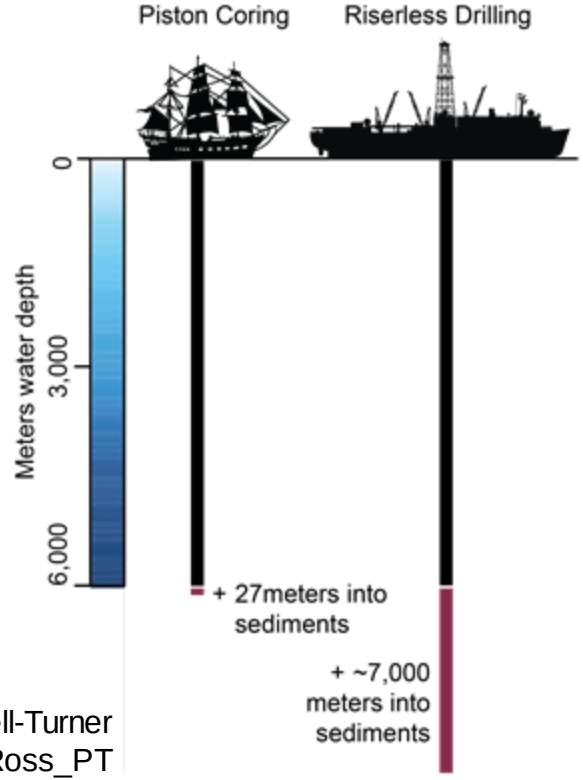
Kuroshio Current Extension warmed by 8°C across the analogous warm period.

KCE Could warm another 6–7°C within the next few decades, **leading to 8°C of total warming from pre-industrial times**.




Without riserless drilling, ***we cannot*** reach sedimentary archives to reconstruct western boundary currents across analogous warm periods to best infer how they will impact society under increasing anthropogenic warming.

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