

Pliocene Three-Dimensional Global Ocean Temperature Reconstruction

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APPENDIX A. PRISM3D Ocean Reconstruction Methodology

PRISM3D SST = Levitus 94 0m + PRISM3 Dec1 Anomaly

Fractions of the surface anomaly were applied at depth to the top 1400m.

PRISM3D 10m = Levitus 94 10m + PRISM3 Dec 1 anomaly (0.985612922)
PRISM3D 20m = Levitus 94 20m + PRISM3 Dec 1 anomaly (0.925614579)
PRISM3D 30m = Levitus 94 30m + PRISM3 Dec 1 anomaly (0.883391208)
PRISM3D 50m = Levitus 94 50m + PRISM3 Dec 1 anomaly (0.821220811)
PRISM3D 75m = Levitus 94 75m + PRISM3 Dec 1 anomaly (0.763600719)
PRISM3D 100m = Levitus 94 100m + PRISM3 Dec 1 anomaly (0.717635117)
PRISM3D 125m = Levitus 94 125m + PRISM3 Dec 1 anomaly (0.678759932)
PRISM3D 150m = Levitus 94 150m + PRISM3 Dec 1 anomaly (0.644737485)
PRISM3D 200m = Levitus 94 200m + PRISM3 Dec 1 anomaly (0.586584444)
PRISM3D 250m = Levitus 94 250m + PRISM3 Dec 1 anomaly (0.537401792)
PRISM3D 300m = Levitus 94 300m + PRISM3 Dec 1 anomaly (0.494358545)
PRISM3D 400m = Levitus 94 400m + PRISM3 Dec 1 anomaly (0.420786655)
PRISM3D 500m = Levitus 94 500m + PRISM3 Dec 1 anomaly (0.358563587)
PRISM3D 600m = Levitus 94 600m + PRISM3 Dec 1 anomaly (0.304107742)
PRISM3D 700m = Levitus 94 700m + PRISM3 Dec 1 anomaly (0.255363558)
PRISM3D 800m = Levitus 94 800m + PRISM3 Dec 1 anomaly (0.211028811)

AAIW was elevated in the Southern Hemisphere bringing cooler temperatures to shallower depths.

PRISM3D 900m = Levitus 94 900m + PRISM3 Dec 1 anomaly (0.170220209) in the Northern Hemisphere; PRISM3D 900m = Levitus 94 900m - 0.3°C in the Southern Hemisphere.

Levitus 94 data for 0m through 900m is an average of November and December monthly data to represent December 1 conditions; Levitus 94 data for 1000m through 5500m is annual average data because monthly data are not provided at

these depths by Levitus 94. Presumably, temperatures at these depths don't change monthly.

PRISM3D 1000m = Levitus 94 1000m + PRISM3 Dec 1 anomaly (0.132307757) in the Northern Hemisphere; PRISM3D 1000m = Levitus 94 1000m - 0.3°C in the Southern Hemisphere.

PRISM3D 1100m = Levitus 94 1100m + PRISM3 Dec 1 anomaly (0.096824449) in the Northern Hemisphere; PRISM3D 1100m = Levitus 94 1100m -0.3°C in the Southern Hemisphere Pacific and Indian Oceans, -0.0°C in Atlantic.

PRISM3D 1200m = Levitus 94 1200m + PRISM3 Dec 1 anomaly (0.063413348) in the Northern Hemisphere; PRISM3D 1200m = Levitus 94 1200m -0.3°C in the Southern Hemisphere Pacific and Indian Oceans, -0.0°C in Atlantic.

PRISM3D 1300m = Levitus 94 1300m + PRISM3 Dec 1 anomaly (0.031794771) in the Northern Hemisphere; PRISM3D 1300 = Levitus 94 1300m in the Southern Hemisphere (no change from modern).

Increased production and temperature of NADW; increased temperatures, especially in the North Atlantic.

PRISM3D 1400m = Levitus 94 1400m + PRISM3 Dec 1 anomaly (0.001745004) in the Northern Hemisphere; PRISM3D 1400m = Levitus 94 1400 + 0.2°C in the Southern Hemisphere.

PRISM3D 1500m = Levitus 94 1500m + 0.3°C (Mediterranean Sea remains modern)

PRISM3D 1750m = Levitus 94 1750m + 0.3°C in Atlantic and Pacific Oceans, + 0.7°C in Indian (Mediterranean Sea remains modern)

PRISM3D 2000m = Levitus 94 2000m +0.5°C in Pacific, +1.0°C in Indian and Atlantic Oceans (Mediterranean Sea remains modern)

PRISM3D 2500m = Levitus 94 2500m +0.5°C in Pacific, +1.0°C in Indian and Atlantic Oceans (Mediterranean Sea remains modern)

PRISM3D 3000m = Levitus 94 3000m + 0.3°C everywhere except +1.3°C in equatorial Atlantic and +2.0°C in North Atlantic

PRISM3D 3500m = Levitus 94 3500m + 0.3°C everywhere except +1.3°C in equatorial Atlantic and +2.0°C in North Atlantic

PRISM3D 4000m = Levitus 94 4000m + 0.3°C everywhere except +1.3°C in equatorial Atlantic and +2.0°C in North Atlantic

PRISM3D 4500m = Levitus 94 4500m + 0.3°C everywhere except +1.3°C in equatorial Atlantic and +2.0°C in North Atlantic

PRISM3D 5000m = Levitus 94 5000m + 0.3°C everywhere except +1.3°C in equatorial Atlantic and +2.0°C in North Atlantic

PRISM3D 5500m = Levitus 94 5500m + 0.3°C everywhere except +1.3°C in equatorial Atlantic and +2.0°C in North Atlantic