Abstract View

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On a Thermal Lag in the North Atlantic Ocean during a Climatic Change

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ABSTRACT

An analysis was made of (i) the annual sea-surface temperature in the northern North Atlantic; (ii) the sea temperatures (0–200 m) along 33°00′E between 70° 30′ and 72°30′N (Kola Section) representative of the inflow of relatively warm North Atlantic water into the Barents Sea; and (iii) the annual air temperatures and pressures over the northern North Atlantic, Greenland, and Europe to determine whether the ocean lags (behind) the atmosphere during a climatic change by comparing the 1951–60 decade with the preceding 1941–50 decade, and with the 1921–50 period as a whole; and the 1961–70 decade with the preceding 1951–60 decade. The results obtained show a *decline* in the air temperature with *no change* in the sea-surface temperature in the 1951–60 decade from the preceding 1941–50 decade, and a *rise* in sea-surface temperature in the 1951–60 decade over the 1921–50 period suggesting a lag in the ocean *vis-a-vis* the atmosphere. The results further show a decrease in both the sea and air temperatures in 1961–70, yet with some of the areas continuing to show either an increase or no change in sea-surface temperatures as evidence of a continuing lag behind the air temperature.

An analysis of the air and sea-surface temperatures of the western Mediterranean (a much smaller body of water and therefore likely to respond more quickly to a climatic change) shows a rise in both the air and sea-surface temperatures in 1951–60 over 1921–50, the rise in the sea-surface temperature being the greater. The results further show a fall in both the air and sea-surface temperatures in 1961–70 from 1951–60, the fall in the air temperature being the greater. Together these changes indicate a predisposition toward a lag in the sea temperature in the Mediterranean.

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