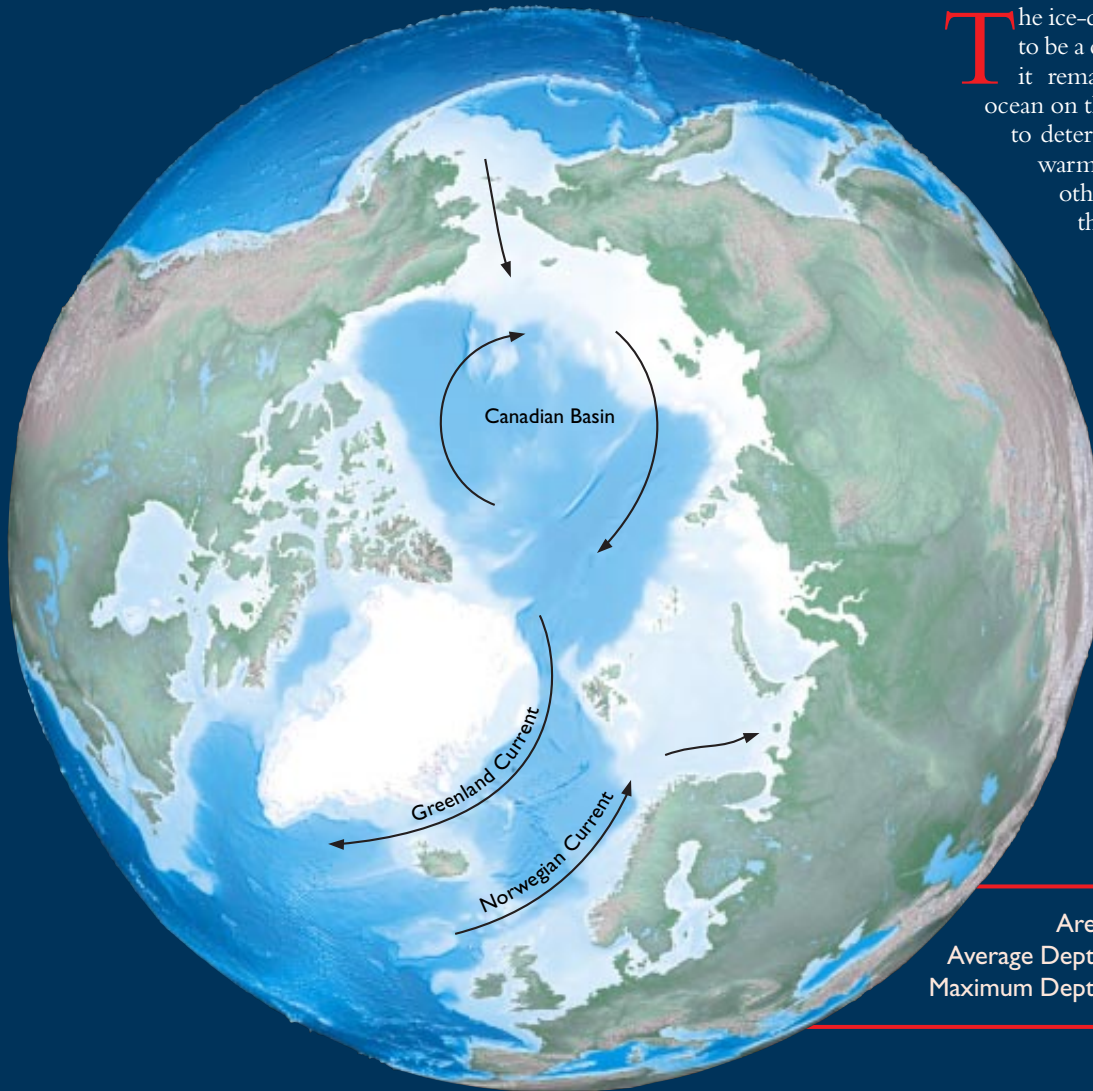


Polar Oceans

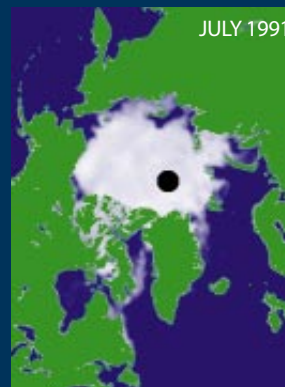


The ice-covered Arctic was first recognized to be a deep basin only a century ago, and it remains today the most enigmatic ocean on the earth. Scientists are still trying to determine, for example, whether the warming that has occurred in most other parts of the planet has caused the Arctic ice pack to thin. Such a change would be worrisome, because only a few meters of ice separate the frigid Arctic atmosphere from the comparatively warm water below. A break-up of the ice would thus allow a great amount of heat from the ocean to pass into the air above, accelerating any warming trend in that far northern region.

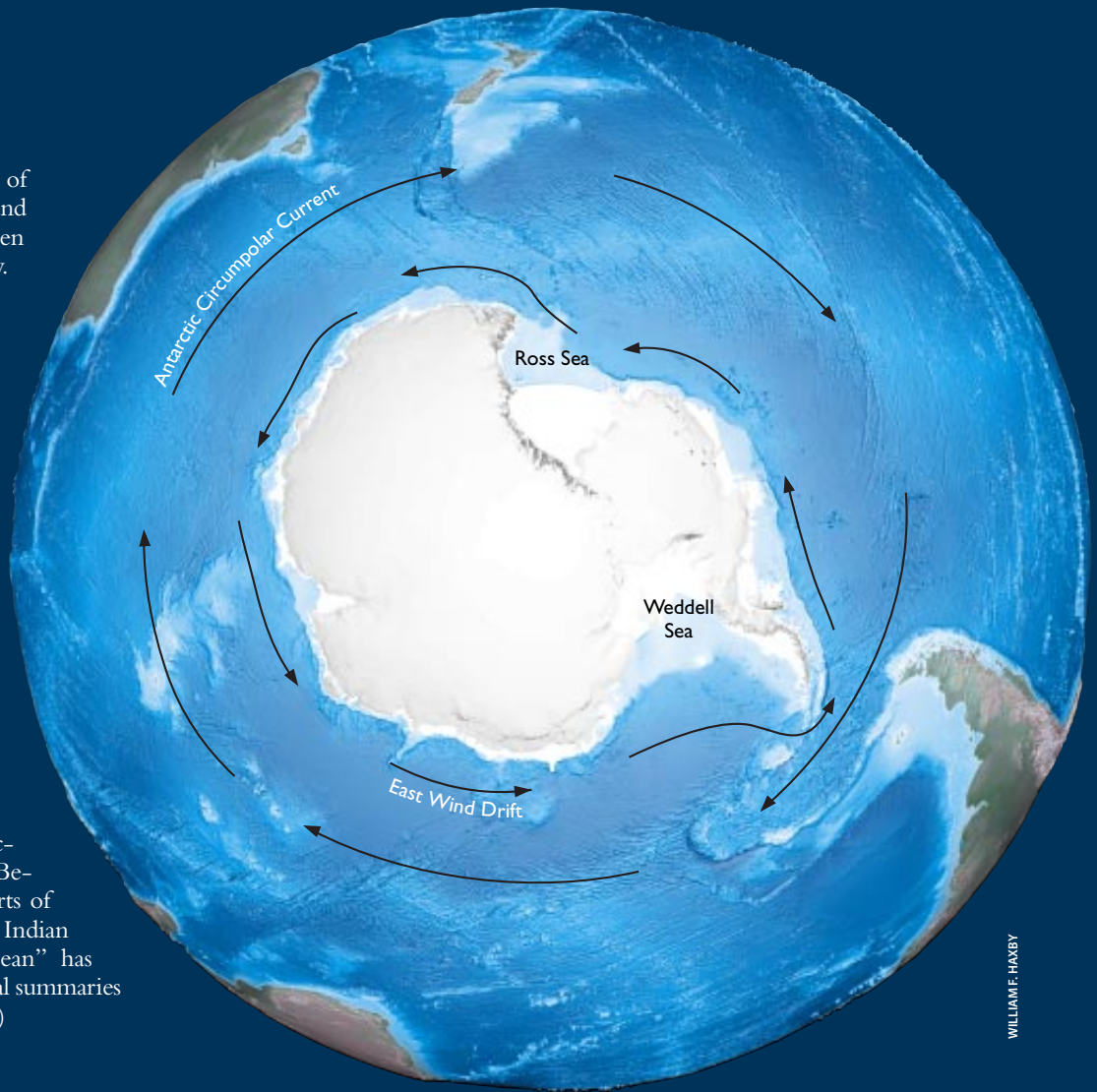
To help answer this question and many others, scientists are beginning to probe the Arctic Ocean in a number of novel ways [see "Forty Days in the Belly of the Beast," by Bernard J. Coakley, on page 36].

Area: 14,090,000 square kilometers
 Average Depth: 988 meters
 Maximum Depth: 5,502 meters

FROZEN BLANKET covers the Arctic Ocean. Polar-orbiting meteorological satellites chart the changing extent of this sea ice there. (The black area is not spanned by the satellite measurements.)

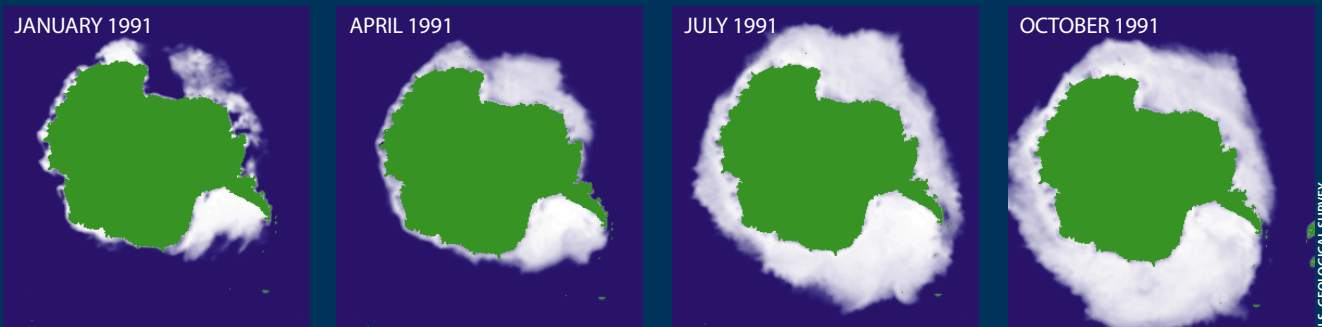


The southern reaches of the Atlantic, Pacific and Indian oceans are often considered a single entity. This vast "Southern Ocean" encircles the Antarctic continent with two counter-rotating sets of currents. Hugging Antarctica and streaming from east to west is the so-called East Wind Drift. Farther north, the eastward-directed Antarctic Circumpolar Current prevails. This strong, wide current, and the winds that drive it, made for arduous journeys from the Atlantic to the Pacific when sailors had to navigate around Cape Horn, the southern tip of South America, before the construction of the Panama Canal. (Being merely the southern parts of the Atlantic, Pacific and Indian oceans, the "Southern Ocean" has been included in the statistical summaries given on pages 8, 10 and 12.)



WILLIAM F. HAXBY

SEA ICE around Antarctica during the southern summer recedes to a position close to the coast, except in the vicinity of the Weddell Sea. In winter the extent of this floating mass of ice increases enormously, although about 5 percent of the area nominally covered contains localized openings.



U.S. GEOLOGICAL SURVEY