Document 2: adapted from 'Arctic Melt Unnerves the Experts', an article by Andrew Revkin, published in the *New York Times* in October 2007. Revkin is a journalist and author and a senior fellow at the Academy for Applied Environmental Studies at Pace University.

The Arctic ice cap shrank so much this summer that waves briefly lapped along two Arctic shipping routes, the Northwest Passage over Canada and the Northern Sea Route over Russia. The floating ice dwindled to an extent unparalleled in a century.

Now the dark season has returned to the North Pole and new ice is spreading over vast stretches of the Arctic Ocean. Astonished by the summer's changes, scientists are studying the forces that exposed one million square miles of open water beyond the average since satellites started measurements in 1979.

Scientists are unnerved by the summer's implications for the future, and their ability to predict it. The pace of change has far exceeded what had been estimated by almost all simulations used to calculate how the Arctic will respond to rising concentrations of greenhouse gases linked to global warming.

The world is paying more attention than ever. Proponents of cuts in greenhouse gases cited the meltdown as proof that human activities are propelling a slide toward climate calamity.

Many scientists said they were becoming convinced that the system is heading toward a new, more watery state, and that human-caused global warming is playing a significant role. Experts are having trouble finding any records from Russia, Alaska or elsewhere pointing to such a widespread Arctic ice retreat in recent times, adding credence to the idea that humans may have tipped the balance. Some scientists who have long doubted that a human influence could be clearly discerned in the Arctic's changing climate now agree that the trend is hard to ascribe to anything else.

"We used to argue that a lot of the variability up to the late 1990s was induced by changes in the winds, natural changes not obviously related to global warming," said John Wallace, a scientist at the University of Washington. "But changes in the last few years make you question that."

Experts say the ice retreat is likely to be bigger next summer because this winter's freeze is starting from such a huge ice deficit. Arctic waters may be behaving more like those around Antarctica, where a broad fringe of sea ice builds each winter and nearly disappears in the summer.

Without thick ice, which can endure months of nonstop summer sunshine, more dark open water and thin ice absorbed solar energy, adding to melting and delaying the winter freeze. The thinner fresh-formed ice was more vulnerable to melting from heat held near the ocean surface. This may be where the rising influence of humans on the global climate system could be exerting the biggest regional influence.

A host of Arctic scientists say it is too soon to know if the global greenhouse effect has already tipped the system to a condition in which sea ice in summers will be limited to a few passageways in northern Canada.

"The Arctic may have another ace up her sleeve to help the ice grow back," Dr Eicken, a geophysicist, said. "But from all we can tell right now, the means for that are quite limited."