



24 July 2025

Context: A significant toxic algal bloom caused by *Karenia mikimotoi* off the coast of South Australia has resulted in the death of over 400 marine species, severely impacting fisheries and tourism. This bloom, exacerbated by climate change, covers an area of 4,500 square kilometers and has been classified as a natural disaster by state officials.



About *Karenia mikimotoi*-induced toxic algal bloom:

- A species of toxic dinoflagellate that is responsible for harmful algal blooms (HABs) around the world.
- It generates reactive oxygen species and ichthyotoxins, which are not directly harmful to humans but are lethal to marine life.

23 July 2025

Varieties and Relatives:

- It is part of the *Karenia* genus, which also includes *Karenia brevis*, known for causing red tides in Florida and producing brevetoxins.
- While *K. mikimotoi* is less toxic to humans, it poses a significant threat to fish, shellfish, echinoderms, and marine invertebrates due to oxygen depletion.

Key Features:

- This species lacks a cellulose cell wall (athecate), making it fragile and easily ruptured in aquatic environments.
- It creates hypoxic or anoxic conditions as large blooms decay, leading to massive fish die-offs, especially during marine heat-waves.
- The toxins affect fish gills, resulting in stress, disorientation, and mortality.
- Although there are no known human illnesses from ingestion, the indirect effects are severe.

About South Australia:

Geographic Location:

- Located in south-central Australia, bordered by Western Australia, Northern Territory, Queensland, New South Wales, and Victoria.
- The southern boundary opens to the Great Australian Bight (Southern Ocean).

Capital: Adelaide

Geographical Features:

- **Area:** Approximately 983,482 square kilometers, making it the fourth largest state in Australia.
- **Climate:** The driest state in Australia, with a Mediterranean climate along the coasts and arid conditions inland.



23 July 2025

Key Landforms:

- **Mount Woodroffe:** The highest peak at 1,435 meters.
- **Lake Eyre:** The lowest point, approximately 15 meters below sea level.
- Notable features include the Nullarbor Plain, Eyre Peninsula, Mount Lofty Ranges, and Flinders Ranges.
- **Major Water Body:** The Murray River, which is the only significant perennial river in the state.