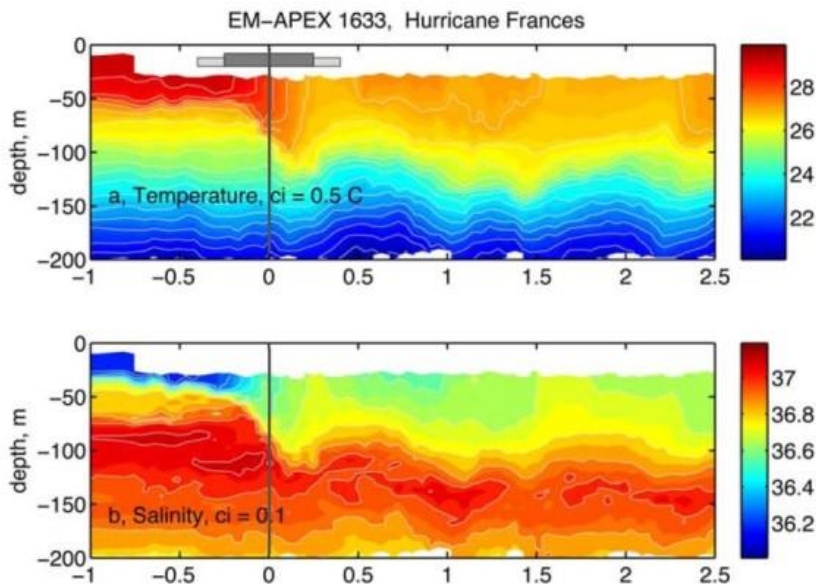


**Hidden Turbulence:  
What happens below the ocean's surface during a hurricane?**

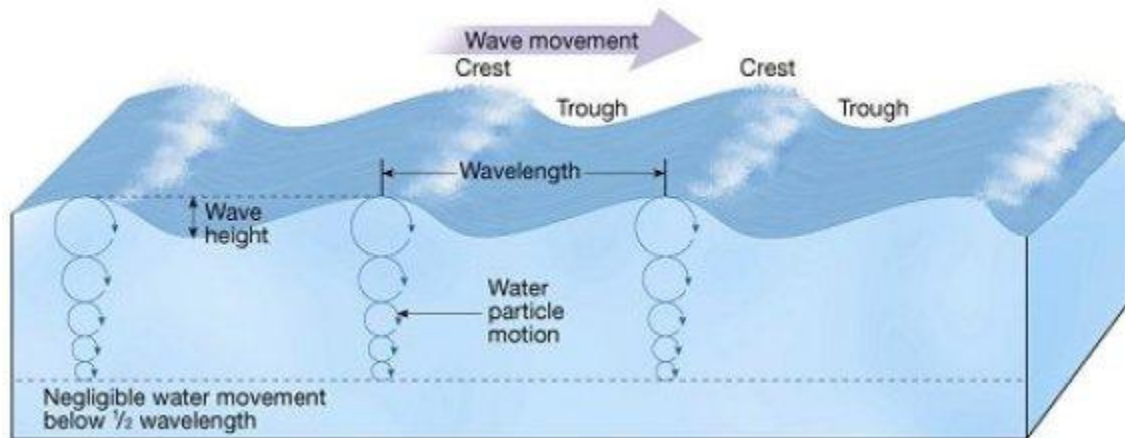
By Mohammad Javanmardi

When someone mentions a hurricane, the first thing that usually comes to mind is a cyclic storm and the massive amount of destruction that is associated with them. The characteristics of Hurricanes, though specific, are widely understood and recognized. The fact that the storm has a large “eye” surrounded by large arrays of cycling storm clouds is what allows for hurricanes to be so easily distinguished from other storms and natural phenomenon. We have seen images of the destruction caused by hurricane Katrina; the thousands of home destroyed and ruined by the massive storm surges. We have seen the images of houses destroyed by tornadoes that spin off of hurricanes once they hit land. However, something that is commonly overlooked is what happens beneath the surface of the sea when a hurricane is moving through the ocean.

The levels of the ocean are characterized by their temperature and salinity (salt concentration). The deeper one goes in the ocean, the saltier and cooler it gets. Ocean surfaces typically consist of higher temperatures and have much lower salt concentrations. This layering is completely mixed up by hurricanes that churn and stir ocean water as they pass overhead. In areas where hurricane movement has been tracked and measured, the sea water is much more homogenous (uniform) in terms of its temperature and salinity. This means that the surface temperature in these areas is much cooler than normal which is actually detrimental to hurricane development (since hurricanes are fueled by warm sea water).



Strong winds of hurricanes can create massive storm surges that can reach up to 60 feet in height. A lesser known fact is that hurricanes also cause powerful torrents of water to pass through the ocean beneath the surface, much similar to underwater waves. These waves echo throughout large areas adjacent to the movement of hurricanes and can last for days after the storm has passed.



Hurricanes can severely impact marine life. Though large solitary creatures such as sharks and whales are able to detect small pressure changes and avoid hurricane affected areas, creatures such as fish, mollusks, crabs, and corals are killed in very high numbers during these storms. Despite the obvious fact that these “underwater waves” can cause damage, the dramatic change in ocean temperature and salinity is what often causes the most damage. Many forms of marine life, particularly corals, are highly sensitive to water temperature and salt concentration. Another major factor of the hurricane that accounts for the 15-20% decrease in coral life is the suspension of sediments in the water column. Corals and other marine plants are dependent upon sun light for survival. When hurricanes travel, they stir up, deposit and relocate tons of sand and silt that make ocean water cloudy, thus preventing sunlight from reaching the plants and coral by burying these organisms when the sand and silt falls out of the water column.

Hurricanes can ultimately be just as destructive and harmful beneath the surface than they can be above it.

#### Sources

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