Warming Oceans Worsened Australiaâ€™s 2010/2011 Floods

As world leaders gather in Paris at the end of the month for the COP 21 climate summit, new research from scientists reveals the destructive impact the warming global ocean can have on society. A study by a team of U.S. and Australian researchers shows that long-term warming of the Indian and Pacific oceans played an important role in increasing the risk of the kind of devastating floods that struck Australia in 2010/2011. The study was published in *Geophysical Research Letters*.

According to lead author Caroline Ummenhofer, a physical oceanographer with Woods Hole Oceanographic Institution (WHOI, USA), the sea surface temperatures around Australia during 2010/2011 were on average 0.5°C warmer than they were 60 years ago. This study is one of the first to show how ocean warming can impact a heavy rainfall event.

In the summer of 2010/2011, Australia was surrounded by extremely warm sea surface temperatures, particularly in the eastern Indian Ocean, western Pacific warm pool region – to the north and east of Papua New Guinea – and the Coral Sea. It led to a summer where rainfall in Australia's northeast was 84% above average and soil moisture measurements were the highest recorded since 1950. This was in spite of it being an average cyclone season.

Both a strong La Niña event and long-term ocean warming contributed to the unusually warm ocean conditions around Australia in 2010/2011. Ummenhofer and her colleagues ran numerical experiments to try to understand how different factors contributed to the unusual 2010/2011 conditions: One experiment included the long-term warming in addition to the La Niña sea surface temperatures, while the other had removed the warming trend. Their research determined that due to warmer sea surface temperatures, Australia was three times as likely to get this much rain during a strong La Niña event.

In addition to the warming oceans bringing more rainfall, previous research has also shown that as a result of global warming, strong La Niña and El Niño events are likely to become more frequent.

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