About the Cover

Tracking hurricanes

This month's cover images appeared originally in the article "Hurricanes and climate", by Kerry Emanuel, available from the Math Awareness Month website at

`http://www.mathaware.org/mam/09/essays/Emanue.pdf`.

A companion audio file can be found at

`http://www.mathaware.org/mam/09/essays.html`.

April is Math Awareness Month, and the theme this year is *Mathematics and Climate*.

The beautiful map of hurricane (more properly "tropical cyclone") tracks (top) is from the Wikipedia Commons, and can be found in the Wikipedia article "Tropical cyclone".

The other image is based on computations by Kerry Emanuel. Details can be found in his article "Tropical cyclones" (which appeared in the *Annual Review of Earth and Planetary Science* (2003) and can also be found on his home page). The colors, more or less intuitively chosen, display computed values of what Emanuel calls the *potential intensity* of the local thermodynamic environment, a rough measure of maximum sustainable wind speed. As the MAM essay says, "Hurricanes always originate where the potential intensity is high … they never form within about 3° latitude of the equator, because there is not enough projection of the Earth's rotation axis."

Emanuel writes further, "…reanalysis data has been created by running a full-physics, operational numerical weather prediction model, assimilating observations from multiple sources, including surface and upper air measurements and satellite data. I solve [a differential equation from "Tropical cyclones"] at each grid node for reanalysis data averaged over each month, and then find (at each grid node) the maximum value over the 12 months."

Next month the *Notices* will continue the theme of mathematics and climate with an article by Kenneth Golden on mathematics and sea ice.

—Bill Casselman, Graphics Editor
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