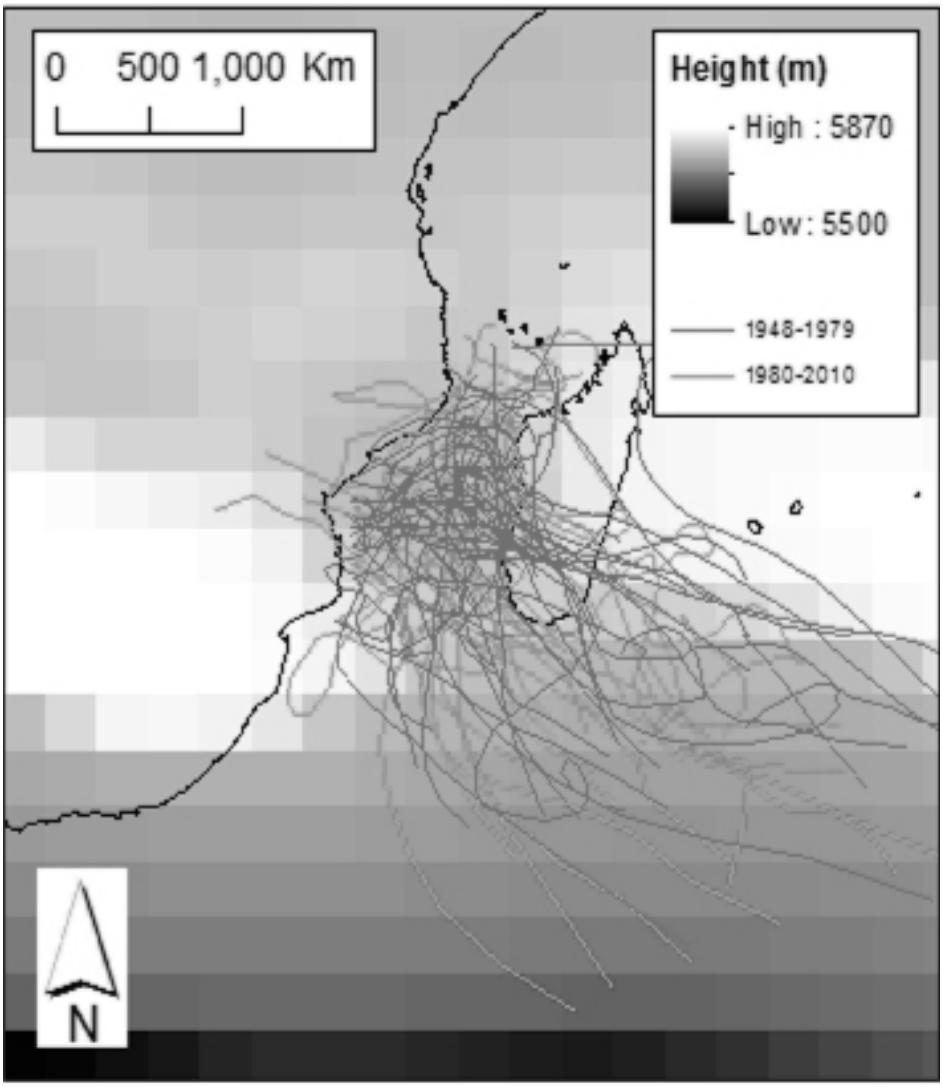
TROPICAL CYCLONES IN THE MOZAMBIQUE CHANNEL AND RAINFALL PATTERNS OVER MOZAMBIQUE

CORENE MATYAS



In January 2015, my research on tropical cyclone formation and motion in the Mozambique Channel 1948-2010 was published in the *International Journal of Climatology*. Results show that 94 tropical cyclones formed in the channel, with approximately 50% making landfall. Formation frequency varied under different phases of the three atmospheric teleconnections: Madden-Julian Oscillation (MJO), Southern Annular Mode (SAM), and Indian Ocean Subtropical Dipole (IOSD). Findings differed when the study period was divided into half, suggesting that inclusion of data prior to 1979 be interpreted cautiously. During the second period, formation tended to occur in the northern (southern) portion of the channel when the IOSD and SAM were negative (positive). The MJO and SAM were associated with differences in atmospheric moisture, while the MJO and IOSD were associated with track curvature. The El Niño Southern Oscillation had the largest effect on mid-troposphere pressure patterns that help steer tropical cyclones. Landfall occurred most frequently when the MJO helped provide the vorticity necessary to generate a disturbance. These relationships can be useful for forecasting tropical cyclone formation and landfall probabilities for Mozambique and Madagascar for storms forming within the channel.

A paper just published in *Applied Geography* by Julie Silva (University of Maryland), myself, and Benedito Cunguara (Michigan State University) explores how rainfall variability and extreme rainfall events may be related to changes in income for rural subsistence farmers across Mozambique. We examined rainfall patterns, agriculture, and income occurring between national surveys of socio-economic data in 2005 and 2008. We utilized rainfall estimates detected by the Tropical Rainfall Measuring Mission and other satellites to develop a 16-year monthly rainfall climatology and determined the percentage of normal rainfall received at each of 665 villages in each study month of the growing season. We sectioned Mozambique into eight rainfall regions based on being impacted by tropical cyclones, floods from non-tropical cyclone rainfall, rainfall deficits, and the receipt of relatively normal rainfall. We then related these weather patterns to changes in inequality and polarization. Contrary to generally accepted view that weather shocks exacerbate existing income and power disparities within societies, we find evidence that inequality and polarization can decline in the aftermath of an extreme event, and increase even where the weather is relatively good.

Corene Matyas is associate professor of geography. *These projects are funded by grants from the National Science Foundation.*