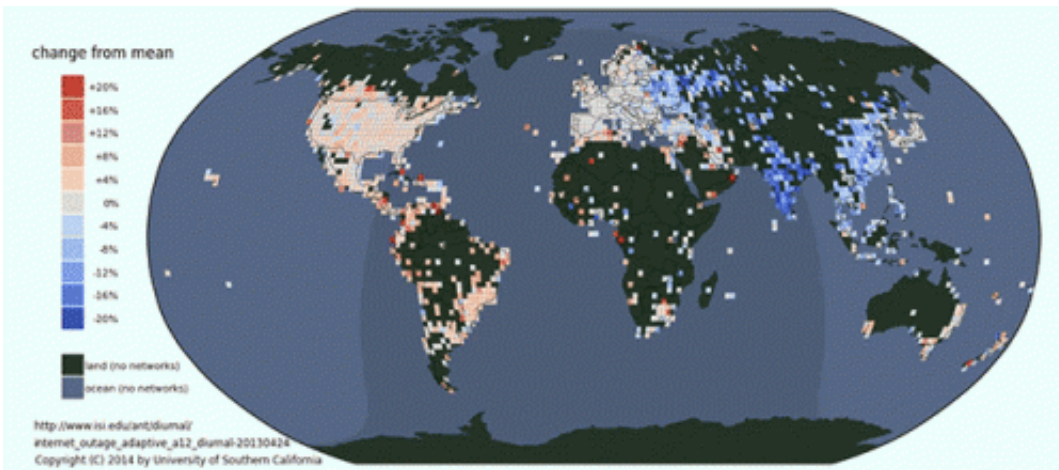# Scientists track Internet usage as it pulses across the globe daily (w/ Video)

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This GIF shows how the Internet "sleeps" in some places but not others. Credit: John Heidemann / USC Viterbi ISI

Researchers studying how big the Internet is have found that it "sleeps," almost like a living creature.

The finding will help scientists and policymakers develop better systems to measure and track Internet outages, such as those that struck the New York area after Hurricane Sandy. Understanding how the Internet sleeps will help them avoid confusing a sleeping Internet with an Internet outage.

"The Internet is important in our lives and businesses, from streaming

movies to buying online. Measuring network outages is a first step to improving Internet reliability," said John Heidemann, research professor at the USC Viterbi School of Engineering's Information Sciences Institute (ISI), and the study's corresponding author.

While the Internet is always up and running for some—such as those with broadband access in the United States and Europe—in other areas, people's access to the Internet varies over the course of the day, notably in Asia, South America, and Eastern Europe.

Heidemann collaborated with USC's Lin Quan and Yuri Pradkin on the study, which will be presented at the 2014 ACM Internet Measurements Conference on November 5.

Their study also correlates countries with strong diurnal Internet access with lower GDP– meaning that the richer a country is, the more likely it is that the Internet will be up and running 24/7.

"This work is one of the first to explore how networking policies affect how the network is used," Heidemann said.

There are 4 billion IPv4 internet addresses. Heidemann and his team pinged about 3.7 million address blocks (representing about 950 million addresses) every 11 minutes over the span of two months, looking for daily patterns.

"This data helps us establish a baseline for the Internet—to understand how it functions, so that we have a better idea of how resilient it is as a whole, and can spot problems quicker," Heidemann said.

The team's work is ongoing. "We have grown our coverage to 4 million blocks [more than 1 billion addresses] as Internet use grows," Heidemann said. He hopes that long-term observations will help guide

Internet operation.

Provided by University of Southern California