# Sea spray represents complex chemistry with big effects on climate

November 25 2014, by Miles O'brien

What will Earth's climate be like in a decade--or sooner? And what will it be like where you live, and around the globe? To help find answers, NSF and other federal agencies awarded grants to study the consequences of climate variability and change. The awards were made through the interagency Decadal and Regional Climate Prediction Using Earth System Models (EaSM) program. NSF is strongly supportive of the EaSM goal of improved understanding of the climate system. According to scientists, the EaSM program addresses one of the most pressing problems of the millennium: climate change and how it is likely to affect the world--and how people can plan for its consequences. That challenge calls for the development of next-generation Earth system models that include coupled and interactive representations of ecosystems, agricultural working lands

and forests, urban environments, biogeochemistry, atmospheric chemistry, ocean and atmospheric currents, the water cycle, land and sea ice and human activities. EaSM projects will expand the limits of scientists' understanding of Earth's climate system, leading to better ways of predicting climate change. Read more in this news release. Credit: Ducks Unlimited

Take in a deep breath of salty ocean air and more than likely, you're also breathing in naturally occurring sea spray aerosols. But, there's much more in each of those tiny bursting "bubbles" than salt. They're also bursting with ocean life, from bacteria to phytoplankton—even viruses. Because sea spray aerosols seed clouds, they affect the climate.

With support from the National Science Foundation (NSF), atmospheric chemist Kimberly Prather of the University of California, San Diego, and chemist Vicki Grassian of the University of Iowa are leading a team of scientists around the country who are working to better understand what role sea spray aerosols play in weather and climate change.

Prather says the single largest uncertainty in climate change is what we don't know about the effect of aerosols on clouds.

Prather and Grassian co-direct NSF's Center for Aerosol Impacts on Climate and the Environment, where chemists are recreating the ocean-atmosphere environment in the lab to study how chemical changes in seawater impact the composition and cloud forming ability of sea spray aerosols. Ultimately, the goal of researchers' experiments is to provide a more accurate representation of aerosol chemistry in computer climate models.