Global satellite maps to reveal ocean areas where winds could produce wind energy

10 July 2008

USA - Scientists have created maps using nearly a decade of data from NASA's QuikSCAT satellite, which reveal ocean areas where winds could produce wind energy.The new maps have
many potential uses including planning the location of offshore wind farms to convert wind energy into electric energy.
"Wind energy is environmentally friendly. After the initial energy investment to build and install wind turbines, you don't burn fossil fuels that emit carbon," said study lead author Tim Liu, a senior research scientist and QuikSCAT science team leader at NASA's Jet Propulsion Laboratory in Pasadena, California."Like solar power, wind energy is green energy," he added.

QuikSCAT, launched in 1999, tracks the speed, direction and power of winds near the ocean surface. Data from QuikSCAT, collected continuously by a specialized microwave radar instrument named SeaWinds, also are used to predict storms and enhance the accuracy of weather forecasts.Wind energy has the potential to provide 10 to 15 percent of future world energy requirements, according to Paul Dimotakis, chief technologist at JPL.

If ocean areas with high winds were tapped for wind energy, they could potentially generate 500 to 800 watts of energy per square meter, according to Liu's research. Dimotakis noted that while this is slightly less than solar energy (which generates about one kilowatt of energy per square meter), wind power can be converted to electricity more efficiently than solar energy and at a lower cost per watt of electricity produced.
According to Liu, new technology has made floating wind farms in the open ocean possible. A number of wind farms are already in operation worldwide. Ocean wind farms have less environmental impact than onshore wind farms, whose noise tends to disturb sensitive wildlife in their immediate area. Also, winds are generally stronger over the ocean than on land because there is less friction over water to slow the winds down. There are no hills or mountains to block the wind's path.

Ideally, offshore wind farms should be located in areas where winds blow continuously at high speeds. The new research identifies such areas and offers explanations for the physical mechanisms that produce the high winds.

The new QuikSCAT maps, which add to previous generations of QuikSCAT wind atlases, also will be beneficial to the shipping industry by highlighting areas of the ocean where high winds could be hazardous to ships, allowing them to steer clear of these areas.

Scientists use the QuikSCAT data to examine how ocean winds affect weather and climate, by driving ocean currents, mixing ocean waters, and affecting the carbon, heat and water interaction between the ocean and the atmosphere.

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