**Our Ocean Backyard — *Santa Cruz Sentinel* columns by Gary Griggs, Distinguished Professor of Earth and Planetary Sciences, UC Santa Cruz.**

## #264 June 10, 2018
## Harnessing Offshore Wind

There is a lot of renewable energy offshore, although to date most of the successful efforts to harness it commercially have been focused on wind turbines. And 99.9% of those turbines are offshore of eleven European countries. Wind farms there are growing rapidly. The total operating capacity of offshore wind farms more than doubled between 2006 and 2008, and then quadrupled between 2009 and 2014.

We are lagging way behind in the USA, and while offshore wind has been providing electricity to northern Europe for over 25 years, there is only one offshore wind farm operating along the entire USA coastline.

With the single exception of the Block Island, Rhode Island project, all efforts to date to put a wind farm in the water have failed due to a combination of political opposition, bureaucratic challenges, projected or perceived costs, and environmental concerns including the visual impacts of tall towers, and the potential for impacts to bird and marine mammals.

There has now been ample experience in Europe, however, as well as considerable baseline information gathered along the U.S. mid-Atlantic offshore area on birds, sea turtles and marine mammals, that many of these problems can been resolved or greatly reduced through technology refinements and optimal siting of the farms.

We need to build on this existing foundation of research, environmental impact assessment, and experience with existing facilities, and not see every new proposal as the time to start from square one all over again.

While any large energy facility will be visible from somewhere, and there will always be some local opposition, we need to look carefully at the alternatives and their impacts. As long as we continue to oppose and delay well-planned renewable energy projects, the more fossil fuels we will continue to burn and the more greenhouse gases we will emit, with all of their associated impacts. About 64% of all of the US electricity generated is still from fossil fuels.

The proposed Cape Wind, Massachusetts, project, is a good example of the challenges and difficulties that lie along the path to successful approval and construction of an offshore wind farm in state waters. For ten years, beginning in November 2001 when the original application was submitted, this project was expected to be the USA's first successful offshore installation.

Relatively calm and shallow water, and consistent winds seemed to make the area off Nantucket Sound an ideal location. The proposal involved the construction of 130 individual turbines about 5 miles offshore, each about 250 feet high, covering an area of about 25 square miles. At completion the project would have had a capacity of 468 megawatts, or able to provide power for about 200,000 homes.

But this renewable energy project faced strong opposition from a number of organizations, who brought dozens of lawsuits against the project, claiming that it would harm birds and other wildlife, increase electricity rates, endanger airplanes, drive tourists away, conflict with fishing and recreation, industrialize the area,

damage submerged vegetation, change sediment transport, fragment habitat- this was a very long list- but it appears that the greatest concern for residents of Martha's Vineyard and Nantucket was that it would simply impact their ocean views.

As any dedicated environmentalist knows, however, regardless of merit or impact, you bring up every possible issue in order to stop a project you are against.

The proposed project did break some important new ground in being the first U.S. offshore wind farm proposal to conduct an extensive environmental assessment. The thousands of pages of that independent analysis did help to calm some groups who were skeptical of the project. Except for one temporary decision, all of the judicial rulings were in favor of the project. Nonetheless, it was planned for the wrong location, in view of some powerful and very wealthy people, and after over $100 million in investment and ten years, the project died.

As the obituary for Cape Wind was written, however, there is renewed optimism along the Atlantic coast. With increasing concerns about the impacts of climate change, the states of Maryland, New Jersey, New York, Rhode Island, and yes, even Massachusetts, are looking offshore for wind farm sites. In April the Department of Interior announced a proposed lease sale in federal waters off Massachusetts for 390,000 acres for wind energy leasing.

As of early 2016 there were 21 offshore projects in the planning and development stages along the Atlantic coast. Thirteen of these were in the more advanced states, totaling 6,000 MW, enough to generate the electricity to power about 2.5 million homes. Potentials are one thing, however, but permits, financing, construction and

operation are quite another, but we are moving in the right direction- aggressive incrementalism.