Some land conservation measures unpopular among property owners

August 7 2017

Fence Creek, Madison, Connecticut. Credit: UConn

While popular with conservation groups, coastal easements that prevent development in order to protect marshland from changes brought about by climate change and rising sea levels are not favored by property

owners, according to a new study by the University of Connecticut and Virginia Tech.

The findings, based on the results of surveys conducted in 2015 of 1,002 owners of Connecticut coastal properties, suggest that relying on education about sea level rise and the ecosystem benefits of marshes alone will not protect land from future changes. Since private landowners are critical partners in efforts to save coastal marshes, identifying the best strategies will be essential to success.

The study, conducted by Christopher Field and Chris Elphick of UConn and Ashley Dayer of Virginia Tech, followed two major storms—Hurricane Irene in 2011 and Hurricane Sandy in 2012—providing a valid measure of whether experience influences attitudes about taking action to lessen future risks.

Landowners in the study indicated skepticism about granting easements based on concerns as to whether they will be offered a fair price in exchange for keeping land as open space where marshes can migrate as seas rise. They also indicated worry that environmental organizations "might not act fairly or transparently in their efforts to encourage tidal marsh migration," the researchers write in an article published in the Aug. 7 issue of the *Proceedings of the National Academy of Sciences*.

In the study area alone—the Connecticut coast—there are an estimated 30,000 landowners in the zone projected to become tidal marsh by 2100, and millions of people globally live near tidal marshes. Whether they decide to leave room for marshes to move inland or instead build seawalls that harden shorelines means the difference between saving tidal wetlands and their many ecological, economic, and recreational benefits, or losing them altogether.

While surveyed landowners whose properties flooded during the

hurricane were 1.4 times more likely to say they may be willing to sell their vulnerable land outright, the real world results call those stated intentions into question. Federal buyout programs after both hurricanes acquired fewer than 100 properties in the study area, although many more were eligible, the study states.

If land protection agreements with nonprofits and government agencies aren't the answer, what offers greater promise for the future of marshes?

Surveyed landowners responded favorably to the idea of restrictive covenants, even though they typically do not include financial incentives. Under restrictive covenants, an entire neighborhood agrees to forgo building seawalls and other shoreline armoring structures. However, note the researchers, these strategies tend to be counterproductive in the long run, because they divert erosion and flooding to adjoining properties.

Coastal landowners also liked the notion of future interest agreements. Under these programs, private landowners agree to accept the fair market value of their property at the time of signing if future flooding reduces the value by more than half. That future flooding would mean dry upland has been allowed to turn into coastal marsh.

The study was funded by Connecticut Sea Grant, UConn, and the Connecticut Department of Energy and Environmental Protection. Field is a postdoctoral fellow in the UConn Department of Ecology and Evolutionary Biology; Elphick is an associate professor of conservation biology in the UConn ecology and evolutionary biology department and the Center of Biological Risk; and Dayer is assistant professor of human dimensions at Virginia Tech's College of Natural Resources and Environment.

The article, "Landowner behavior can determine the success of conservation strategies for ecosystem migration under sea-level rise,"

offers broad implications for how to best design programs to mitigate other climate change effects. But further analysis is needed, say the researchers.

More information: Christopher R. Field el al., "Landowner behavior can determine the success of conservation strategies for ecosystem migration under sea-level rise," *PNAS* (2017). www.pnas.org/cgi/doi/10.1073/pnas.1620319114

Provided by University of Connecticut