

# Effect of vegetation die-off tested on tidal marshland

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Consisting of densely vegetated platforms raised slightly above sea level, and interwoven by channels of water meandering inland from the coast, tidal marshlands help buffer against strong storm surges, protect against flooding, limit coastal erosion, and provide a valuable habitat for a vast array of coastal species. Continued global climate change, however, has researchers worried about the stability of coastal marshlands in light of rising temperatures, sea levels, and a declining ocean pH. Of particular concern over shorter timescales are the potential consequences for marsh dynamics should there be a mass die-off of marshland vegetation.

Investigations of the effects of mass vegetative death on marshland behavior have been conducted almost exclusively using [computer simulations](#), but Temmerman et al. sought to bolster this previous research with empirical evidence. The authors measured water flow rates and directions in Kijkverdriet, a freshwater tidal marsh in northern Belgium, both before and after they clear-cut 0.04 square kilometers (10 acres) of vegetation. They find that flow rates increased over the previously vegetated land and decreased in the vegetation-free channels, essentially equalizing the flows over the whole area. They find that, following their intervention, the water flow direction over the freshly barren platforms became increasingly parallel to the nearby channel's flows.

Finding good agreement between their observations and the predictions of modeling efforts, the authors suggest that a large-scale plant die-off would lead to sediment infilling of marsh channels and reduced

sedimentation to the previously vegetated platforms. They say that this would further reduce the survival of future marshland vegetation, triggering a runaway feedback cycle culminating in permanent marsh loss.

**More information:** AGU's blog, GeoSpace, includes a story on the findings at [bit.ly/Auy2wo](http://bit.ly/Auy2wo) .

Paper: Impact of vegetation die-off on spatial flow patterns over a tidal marsh, *Geophysical Research Letters*, [doi:10.1029/2011GL050502](https://doi.org/10.1029/2011GL050502) , 2012

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