

Wetlands Saved Middlebury \$1.8M During Tropical Storm Irene, Study Finds

By KATHLEEN MASTERSON · JUL 8, 2016 (VPR.NET)

Wetlands and floodplains along Otter Creek protected Middlebury from more than \$1.8 million of flood damage during Tropical Storm Irene, according to a [new study](#) from the University of Vermont.

These natural buffers act as sponges and absorb excess floodwaters, and they will be even more important as climate change brings more severe weather, says lead researcher [Keri Watson](#) of the Gund Institute.

“With climate change, we’re already seeing an increase in the severity and frequency of floods in New England, and globally,” says Watson. “We know that wetlands and floodplains can reduce impacts, but it’s really hard to act on that if don’t know size of that impact.”

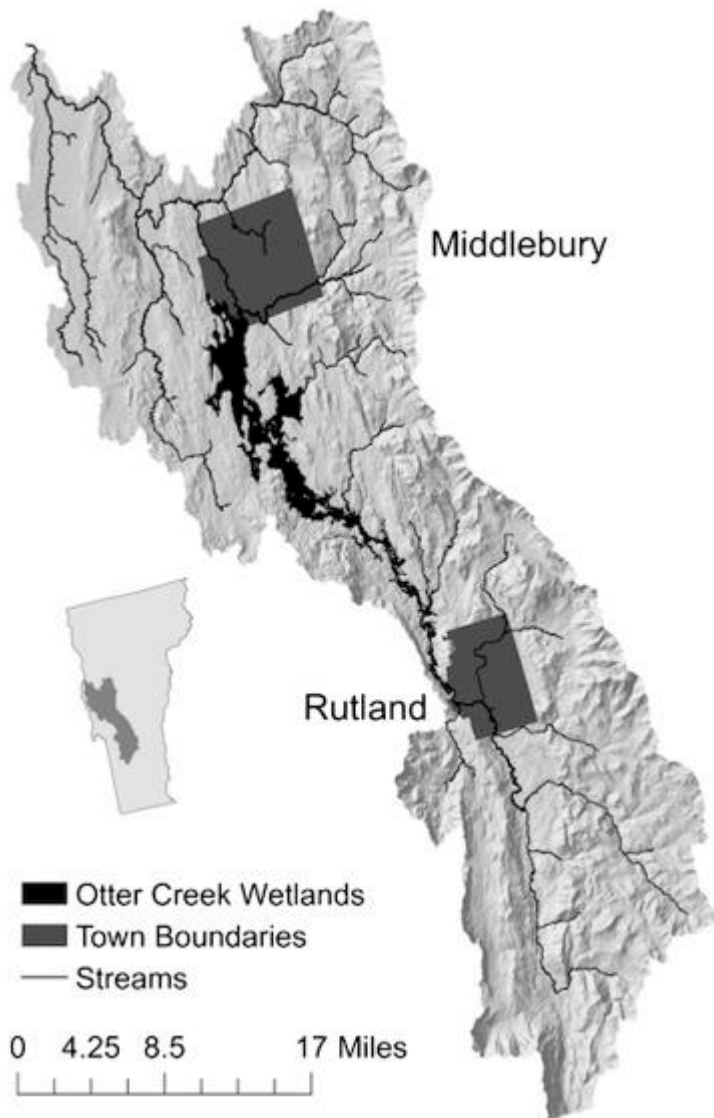
Researchers used water level data from upstream and downstream of town to calculate how much more water – and damage — would have struck Middlebury without these natural buffers.

Watson says that the true value of the destruction avoided in Middlebury is actually far greater than \$1.8 million.

That’s because “in Vermont, a majority of flood damages actually occur as the result of erosional impacts, and impacts to infrastructure like roads and bridges,” she says. “And we couldn’t get at those damages, so the values we present in our study are really conservative for that reason.”

Watson says the study could only evaluate a small portion of avoided damages, which means the protective value of the wetlands is far higher.

Some communities in Vermont face the additional challenge that the rivers and creeks upstream have been straightened over the years, which makes the waters faster and deeper — and disconnects the rivers from their natural sponge buffers, wetlands.



Researchers measured water levels in two places to estimate how much water would have flooded Middlebury if not for the natural buffers.

That's why the Department of Environmental Conservation is working on a [river corridor program](#) to allow the rivers to slowly recreate protective floodplains.

“Communities that are benefiting from these wetlands and floodplains are going to be more resilient to climate change, and this is huge challenge we have ahead of us,” says Watson. She adds: “Protecting these wetlands and floodplains so that they can continue to protect us is extremely important.”

UVM Study: Floodplains Saved Middlebury \$1.8M in Damage

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Wetlands and floodplains protected Middlebury, Vermont, from as much as \$1.8 million in flood damage during Tropical Storm Irene, a new University of Vermont study finds.

The study is the first to calculate the economic benefits that river wetlands and floodplains provided during the major storms that have struck the U.S. East Coast in recent years.

Researchers analyzed 10 flood events to estimate the value of the Otter Creek floodplain near Middlebury. According to the study, the natural barrier saves the town an average of \$126,000 to \$450,000 per year, or up to 78 percent of potential damages.

“These findings show the huge value of ‘natural infrastructure,’” says lead author Keri Bryan Watson, a PhD student in UVM’s Gund Institute and the Rubenstein School of Environment and Natural Resources.

As floods become more frequent and destructive worldwide, the research – published in *Ecological Economics* journal – gives regional planners powerful argument for protecting key wetlands.

“This study shows policy makers the importance of conservation investments that make communities more resilient to the impacts of climate change,” says Deb Markowitz, Secretary of Vermont’s Agency of Natural Resources. “By putting a price tag on wetlands and floodplains, we can demonstrate the value of natural infrastructure to protect communities from the increased risks of flooding from climate-related storms.”

The study also offers researchers an important new method for assessing the value of natural flood barriers.

Floodplains at risk

Wetlands are swampy areas typically located in floodplains, which are wide swaths of land bordering bodies of water. Together they act as sponges to hold excess water and slow it from cascading to low-lying areas.

A Louisiana native, Watson's childhood home bordered a floodplain. She witnessed small local flooding events, and followed the effects of Hurricanes Katrina and Rita closely.

This personal connection drove her to investigate the financial benefits of natural flood barriers, as global flood risks grow due to climate change and development, she says.

Among the threats to floodplains are the straightening of rivers to keep water away from new residential and business developments. These actions – often to mitigate flooding risk in one area – can wreak havoc on downstream communities. Events like Irene highlight these consequences, she says.

“It's really a problem of regional coordination, of understanding that everything that happens upstream can affect towns downstream,” says Watson, who conducted the study with UVM's Taylor Ricketts, Gillian Galford and Jarlath O'Neil-Dunne, with Stephen Polasky of the University of Minnesota.

Nature's flood protection

The researchers used data from the U.S. Geological Survey, which tracks water levels in Middlebury and Rutland, two towns that bookend the Otter Creek floodplain. This helped Watson study different water levels, and calculate how much more water – and damage – would have struck Middlebury had the floodplain not slowed the deluge.

Using federal flood insurance models, Watson then estimated the monetary damages flooded homes and buildings would have faced. The study didn't assess town infrastructure: roads, bridges and utilities. That would increase wetland benefits even further, she says.

“Knowing the effects and value of floodplains will help developers and regional planners make better long-term decisions,” says Watson. “These are valuable natural resources we should try our best to protect.”

Key findings

During Tropical Storm Irene in 2011, floodplains and wetlands diminished damages in Middlebury, VT, by 84 to 95 percent – saving potentially as much as \$1.8 million in flood damages.

Middlebury saves an annual average of \$126,000 to \$450,000 in damages due to the Otter Creek floodplain, which reduced damages by 54 to 78 percent, on average, across 10 flooding events.

Background

Study: Quantifying flood mitigation services: The economic value of Otter Creek wetlands and floodplains to Middlebury, VT.

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