

Sea level rise will especially hurt poor

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ODU modeling and simulation professor Joshua Behr

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Standing in front of a large graph that displayed what looked like Richter scale results trending upward, Old Dominion University professor Tal Ezer began explaining.

The graph showed the highest and lowest flood levels at Sewell's Point in Norfolk in each year since the late 1920s, and small red circles marked the years in which floodwater was more than seven feet deep.

"Because of the sea level rise," he said about the red circles, "such a flood that happened about two times over 70 years has now happened four times over the past seven years."

Ezer was one of five panelists who spoke last week during the Sea Level Rise session at EConference, an annual forum at which alternative energy, green development and related topics are discussed.

Held at the Ted Constant Center in Norfolk, the conference was sponsored by ODU's Business Gateway and Inside Business.

Besides increased frequency of deeper floods, Ezer said flood hours are up, too.

From 1928 to 1982, according to another graph the oceanographer showed, the number of flood hours at The Hague in Norfolk never topped 100 in a given year.

The last four years, however, have seen no fewer than 200 annual flood hours, including more than 300 flood hours in 2009.

Norfolk is considered on the front lines of an effort to address the threat of a rising sea level and subsidence - or land sinking - and several national media outlets have spotlighted its fight.

At his annual state of the city address, Mayor Paul Fraim said \$14 million has been spent in the past two years on storm water and flooding projects, and Norfolk was fortunate to have escaped October's Hurricane Sandy.

"We have already been to the White House," Fraim said, "where we met with officials of the Office of Management and Budget to advise them we will be seeking flood mitigation funding no later than the 2015 federal budget, probably in the amount of \$1 billion."

In 2010, ODU created a Climate Change and Sea Level Rise Initiative that, among other things, takes a multidisciplinary approach to the issues.

Some of the team's members spoke at the session last week, including modeling and simulation professor Joshua Behr; engineering professor Rafael Diaz; and geography professor Hua Liu.

Behr, who also has a background in health and political science, said "medically fragile, modest- to low-income" populations will be least able to adapt to sea level rise.

He said storm surges and flooding churn up the industrial waste that is most common in urban areas, and that minority populations have been the least likely to be aware of or active in those issues.

"We already know that there are sizable gaps or differences between minority and non-minority communities in Hampton Roads when it comes to basic health-related conditions," Behr said.

"And we expect that those impacts grow over time if the interventions are not tailored to address those communities specifically."

Diaz said that the potential results of sea level rise run the gamut, from health hazards to the attractiveness of Hampton Roads real estate and property.

Liu showed a map of Hampton Roads that depicted vulnerability to sea level rise by color.

U.S. Census block groups colored red were most at risk; yellow and green denoted medium and low risk, respectively.

"It's depressing to see that we do not have many green areas," Liu said.

Kevin Smith, an associate engineering geologist with Fugro Consultants Inc., said his firm is working with the city on plans to mitigate the impact of sea level rise and flooding.

The Netherlands-based company, retained in 2008, is in its second three-year contract with the city.

Since the company's been here, it's installed a network of tide gauges, identified flood-prone areas and evaluated various flood mitigation concepts.

"That could be a flood wall or a levy or a new pump station," Smith said.

The firm has selected four test sites for these concepts, Smith said, and preliminary designs have been completed for three areas.

"We've also developed a citywide, coastal flood master plan," Smith said. "Basically it's what would be required to build a coastal flood project around the city. And that's where we're at right now."nib