



UAA College of Engineering
UNIVERSITY of ALASKA ANCHORAGE

UAA Professional Development Seminar Series



Defining the Cost of Coastal Hazards

Presented by: Dr. Tom Ravens, Professor,
UAA Civil Engineering

ABSTRACT: In this presentation, multiple approaches for estimating the cost of coastal road flooding and coastal erosion will be presented, using the community of Hooper Bay, Alaska as an example. First, a generic approach to estimate the cost of coastal road flooding based on the annual flood exposure (km-hours/year) will be described. In this approach, we determine the unit cost of flood exposure (USD/km-hours of flooding) based on historic projects to mitigate road flooding, and their cost and effectiveness. With the unit cost of flood exposure in hand, as well as estimate of the annual flood exposure (km-hours/year), we compute the current and future cost of flooding for Hooper Bay. The approach can be readily reproduced to produce a map of coastal road flooding throughout coastal and riverine Alaska. Second, we validate the first cost estimate by identifying and providing cost estimates for multiple alternative approaches to road flood mitigation including elevation of roads and building dikes.

In the second part of the presentation, we switch the focus to estimating the cost of coastal erosion. Here, we present two approaches to estimate the cost of erosion. In the first approach, we use available shoreline change predictions to estimate the length of shoreline protection needed. Then, we use data from completed shoreline protection projects to develop estimates of the future cost of protection. In a second approach, developed by the Alaska Division of Geological and Geophysical Surveys, we provide estimates of the cost of erosion based on the cost of replacement of infrastructure impacted by erosion. Time permitting, we will also provide updates on our work to develop Arctic-capable, process-based coastal erosion prediction tools.

BIO: Tom Ravens has been a Professor of Civil Engineering at UAA since 2007. Prior to working at UAA, he was a Professor at Texas A&M University at Galveston. Tom's primary research focus is Arctic coastal processes and engineering with a focus on coastal erosion, flooding, and coastal protection. Tom has also researched hydrokinetic renewable energy focusing on resource assessment and hydraulic impacts of hydrokinetic energy extraction. He is currently PI of the NSF-funded Arctic Coastal Risk Network.

Friday, February 10, 2023

11:45 am - 12:45 pm

Online Via [YouTube Live](#)