Make America’s Swamps Great Again

An opinion-editorial by
Kevin G. Coulton, PE, CFM
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Mr. Kevin G. Coulton  
Troutdale, Oregon

May 24, 2018

Dear Mr. Coulton,

Thank you for your thoughtful suggestions on how to address important issues facing our Nation. I am honored to work on behalf of all Americans to grow our economy, protect our citizens, and strengthen American leadership around the world.

When America is united, there is no challenge too great. Together we will prosper, and we will get the job done. Thank you again for your suggestions.

Sincerely,

[Signature]
“The Trump Administration has announced an “America’s Infrastructure First” policy that supports investments in pressing domestic infrastructure needs.

While I understand and am supportive of the need to improve our Nation’s infrastructure, I am concerned that the new administration may end up draining more than just the “political swamp” to accomplish this goal and place new and rebuilt infrastructure at risk from natural disasters...especially flooding, the most costly natural disaster in the America.”
“America was first made great because of our natural resources and, in part, by the draining of swamps (the bogs, marshes, and frequently flooded areas, collectively known as wetlands) to allow navigation, agriculture, transportation, and land development to occur and our Nation to prosper.”
“Ironically, we drained and filled swamps to build some of our first political infrastructure. In the early days of Washington, D.C. a flood-prone area below Capitol Hill was drained, and the U.S. Army Corps of Engineers (USACE) dredged the Potomac River in the 1870s, and used dredged sediment to fill floodplain wetlands. Now portions of the National Mall, including the Capitol Reflecting Pool, are located where natural swamps used to be.”

“This conversion of the natural to built environment is characteristic of our perception of “infrastructure”; i.e., over the eons, human society has attempted to dominate and control nature to survive, then subsist, and now hopefully flourish.”
“As a practicing civil engineer I was taught to design infrastructure and for much of my career I associated this with the tangible concrete and steel projects built by engineers that we see around us. This definition of infrastructure is supported by the American Society of Civil Engineers (ASCE)—which I am a member—that publishes a Report Card for America’s Infrastructure every four years.”
“The U.S. Army Corps of Engineers (USACE) manages the federal dams and levees in the U.S., part of the nation’s water resources civil works infrastructure. In addition to annual appropriations to maintain these dams and levees, in recent years the USACE has frequently requested supplemental appropriations from Congress to cover unanticipated costs incurred for flood fighting activities and repairs to flood control infrastructure.”
“The economic value of this infrastructure is declining because the costs to fix, operate, and maintain what is on the ground is increasing to make these civil works...work.”
“A review of USACE civil works budget requests from Fiscal Years 2003 through 2017 indicates construction budgets have been steadily declining while operation and maintenance (O&M) budgets are on an uptick in recent years. This O&M trend may be much higher because nonfederal local sponsors own much of this infrastructure after it is constructed and they are responsible for its upkeep.”
“Flood losses in the U.S. reached an annual average of $10 billion in the 2000s, a nearly 5-fold increase from the early 1900s. In 2016 alone, the U.S. had more floods than any year on recent record and the resulting flood losses were approximately $17 billion.

These loss trends will likely increase because America was first made great by building infrastructure on vulnerable coastlines and river floodplains.”
“FEMA flood hazard mapping has significant limitations because it is based on existing conditions to establish actuarial rates for flood insurance and it does not include projected future conditions, and many maps are outdated.”
“For example, the President himself owns a significant amount of coastal infrastructure and his Mar-a-Lago estate in Florida is located in a FEMA flood hazard zone that was established back in 1982.”
“The National Oceanic and Atmospheric Administration (NOAA) has documented a rise in mean sea level of nearly a half foot in this area since the FEMA map was published 35 years ago and an accelerating rise in local sea levels, combined with more frequent rain, high tide, and storm surge events, may lead to an increasing frequency of flooding for this region in the years to come.”
“In the early 1900s, Allen Hazen, one of America’s first flood control experts, and a Vice President of ASCE, wrote in 1930, “the increase in the amount of damage from floods has been occasioned more by the increased occupation of areas that are sometimes flooded than by any increase in the volume of flood flows.”

“An immense amount of infrastructure has since been built in the U.S. to control flooding, yet flood losses are increasing and the cost to simply maintain this infrastructure is also increasing, to protect what we have built in swamps and floodplains.

Furthermore, the benefits of our flood control infrastructure may be diminishing as design assumptions from decades ago become invalidated by a changing climate.”
“From a pure business standpoint, it seems that the economic and societal value of these investments may be declining. The new President is a businessman and, as he says in his book, The Art of the Deal, he takes a very conservative approach and always anticipates the worst. As he leads the nation to rebuild our infrastructure, I would encourage him to anticipate the worst and consider an approach to reduce flood risk through infrastructure spending that costs less to maintain and is more resilient to future flooding.”
“But what should we do?”
“Again, from the President’s book, “Sometimes your best investments are the ones you don’t make.”

I agree, and some of the best flood risk reduction infrastructure is already available to us free of charge and involves working with the natural systems of forests, floodplains—and, yes, swamps—that have inherent natural abilities to slow the movement and reduce the force of water as it moves towards the infrastructure that we have traditionally valued.”
“We need to view Nature as our business partner.

Working with nature, instead of against it, will lead to built infrastructure that is more resilient to future flooding and other catastrophes.

This mindset of natural, or green, infrastructure is not a new concept and has been gaining interest, in large part due to the shortcomings of built infrastructure that we have been witnessing in recent decades.”
“The ASCE (or ASFPM?) should begin to also grade the condition of our Nation’s floodplains and their natural ability to store and convey floodwaters to reduce flood risk.”
“With an estimated 20 million acres of floodplain area in the U.S. ...”

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Table 1 Stream order, estimated number of streams, average and total length of rivers and streams, average riparian width and total floodplain surface area in the USA (modified from Leopold et al., 1964).

<table>
<thead>
<tr>
<th>Stream order</th>
<th>Number</th>
<th>Average length (km)</th>
<th>Total length (km)</th>
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<th>Floodplain surface area (km²)</th>
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...and a potential value of $10,000 per acre per year in ecosystem services provided by swamps and floodplains...
“...we may have $200 billion per year in natural infrastructure available to help us reduce America’s flood risk...

...while making America’s swamps great again.”
Make America’s Swamps Great Again
An opinion-editorial by Kevin G. Coulton, PE, CFM

The Trump Administration has announced an ‘America’s Infrastructure First’ policy that supports investments in pressing domestic infrastructure needs1. While I understand and am supportive of the need to improve our Nation’s infrastructure, I am concerned that the new administration may end up draining more than just the “political swamp” to accomplish this goal and place new and rebuilt infrastructure at risk from natural disasters...especially flooding, the most costly natural disaster in America2.

America was first made great because of our natural resources and, in part, by the draining of swamps (the bogs, marshes, and frequently flooded areas, collectively known as wetlands), to allow navigation, agriculture, transportation, and land development to occur and our Nation to prosper. In the early 1600’s, the land area comprising the eventual United States had approximately 221 million acres of wetlands3, now only about half of these important resources remain4.

Ironically, we drained and filled swamps to build some of our first political infrastructure. In the early days of Washington, D.C., a flood-prone area below Capitol Hill was drained5, and the U.S. Army Corps of Engineers (USACE) dredged the Potomac River in the 1870s, and used dredged sediment to fill floodplain wetlands. Now portions of the National Mall6, including the Capitol Reflecting Pool, are located where natural swamps used to be.

West front of Capitol, July 1960

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6 Historian of the National Mall. 2011. "Who do people say the National Mall is built on anyway?" The Renwick Gallery Center for History and Visiting Scholar George Mason University.
Budget cutters threaten to end agency's 115-year tradition of high-quality data

By KEVIN G. COOKSON

The next 100-year flood could come next spring

By KEVIN G. COOKSON

Leaky lessons about our slippery streets

The only drops that fall from vehicles don't drown our roads because they find our water with sink group

Homeland Security can start on America's floodplains.

By Kevin G. Cookson

I recently relocated my house. When the surveyor assured me that I was precisely across the Triboro Bridge, I noticed the flood pools surrounding the structure and was surprised to find water in the basement. I called the Federal Emergency Management Agency (FEMA) during my move and was informed that there were no flood pools on my property. I was confident that this was true.

FEMA states that $1 billion in property losses are expected each year due to flood hazards. In 2001 alone, FEMA paid out $1.1 billion to write flood insurance claims.

The primary purpose of the maps is to define existing flood hazards and to assist coastal communities in planning their development. According to the National Flood Insurance Program (NFIP), 1981, new and updated flood maps have been adopted by at least 34 million residents in the United States. These floodplains are determined by at least 800 federal agencies with the assistance of the National Oceanic and Atmospheric Administration (NOAA). Of the 180 million Americans who live within the 100-year floodplain, more than 50 million are served by the NFIP. This process has been ongoing for over 10 years. The NFIP has been operational since 1968. Since 1981, the National Flood Insurance Program (NFIP) has not been updated to reflect changes in the floodplain. However, over 175 million people live within the 100-year floodplain, which is currently occupied by over 15 million people, and 15 million people are served by the NFIP.
Questions?

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