Make America’s Swamps Great Again

An opinion-editorial by
Kevin G. Coulton, PE, CFM
First Published March 9, 2017

Northwest Regional Floodplain Management Association
Annual Conference, September 25, 2019
THE GROVE HOTEL, BOISE, IDAHO
Make America’s Swamps Great Again

Thursday, January 11, 2018

ASFPM member Kevin Coulton, of Troutdale, Oregon, is serious about getting his message out on natural infrastructure being coupled with traditional infrastructure when protecting people and property from flood risks. That’s why he wrote Make America’s Swamps Great Again, along with a letter to President Trump, urging him to “consider my opinions regarding the value and benefit of natural infrastructure for flood risk reduction.” If you’d like to contact Kevin, he can be reached at kevin.coulton@gmail.com.
THE WHITE HOUSE
WASHINGTON

May 24, 2018

Mr. Kevin G. Coulton
Troudale, Oregon

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]
February 7, 2018

Mr. Kevin Coulton
943 SE 48th Street
Tualatin, Oregon 97060

Dear Mr. Coulton:

Thank you for contacting me about transportation and infrastructure in Oregon. I look forward to hearing from you on this important issue.

For too long, federal investment in infrastructure has been far below what our community’s economy needs. You can’t have a big league economy with little league infrastructure. That’s why I’ve proposed, with my democratic colleagues in the Senate, a $1 trillion infrastructure investment plan.

Our proposal injects $1 trillion toward upgrading our roads, bridges, water systems, and transit systems, but also makes investments in things like energy and broadband to help drive the 21st century. And it’s done in a fiscally responsible way, by closing tax loopholes exploited by corporations and wealthy individuals. This is the kind of direct investment that will grow our economy and it’s done in a fiscally responsible way, by closing tax loopholes exploited by corporations and wealthy individuals.

Recently, we saw the President present his own budget blueprint that includes a Transportation Investment Generating Economic Recovery (TIGER) grant program. Most of these projects are large and expensive, and the average voter is not well informed about what a TIGER grant is or how it would be used.

Despite the savings achieved through federal grants, which help improve their quality of life, and increase economic growth in our community, there are many programs which have bipartisan support in Congress, and the President’s fiscal framework includes the promises to support our nation’s failing infrastructure, and I will fight for these vital ideas.

Sincerely,

Suzanne Bonamici
Member of Congress

January 1, 2018

Dear Kevin,

Thank you for contacting me about President Trump’s infrastructure proposal. I appreciate hearing from you.

Our country must make long-term investments in our infrastructure. In transportation, improving existing infrastructure and strengthening transit ensure investments that grow our economy, create jobs, and develop a strong transportation infrastructure for our residents and visitors. Most of these projects are large and expensive, and the average voter is not well informed about what a TIGER grant is or how it would be used.

Despite the savings achieved through federal grants, which help improve their quality of life, and increase economic growth in our community, there are many programs which have bipartisan support in Congress, and the President’s fiscal framework includes the promises to support our nation’s failing infrastructure, and I will fight for these vital ideas.

Sincerely,

Suzanne Bonamici
Member of Congress

February 9, 2018

Kevin G. Coulton
943 Southeast 48th Street
Tualatin, OR 97060-4556

Dear Kevin,

Thank you for contacting me to share your letter to President Trump regarding your editorial in The Oregonian. I appreciate the time you have taken to share this information with me. Please know that I have made note of and value your perspective.

In my work as a senator, it is helpful to hear your thoughts and comments on the issues that concern you. I hope you will continue to stay in touch.

All my best,

Jeffrey A. Merkley
United States Senator

JM001
“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) budget requests 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.”

Since the publication of the editorial, USACE civil works construction budget requests from Fiscal Years 2018 through 2020 have continued to decline, while operation and maintenance (O&M) budgets requests spiked in 2018 and dropped off significantly in 2019 and 2020. However, O&M budget requests remain higher than construction.

“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.”
Latitude: 26.6771
Longitude: 080.0370
NGVD 29 height: 7.0 FT
Datum shift (NAVD 88 minus NGVD 29): -1.522 feet
Converted to NAVD 88 height: 5.478 feet

The 2017 FIRM maintains the same BFE as in 1982...

Mar-a-Lago
“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.”
Assembly Bill No. 2480

CHAPTER 695

An act to add Section 108.5 to the Water Code, relating to water.

[ Approved by Governor September 27, 2016. Filed with Secretary of State September 27, 2016. ]

LEGISLATIVE COUNSEL’S DIGEST

AB 2480, Bloom. Source watersheds: financing.

Existing law establishes various state water policies, including the policy that the Legislature consider other works as may be necessary to develop water to satisfy the requirements of the watershed in which water originates whenever the Legislature authorizes the construction or acquisition of a project that will develop water for use outside that watershed, as specified.

This bill would declare it to be state policy that source watersheds are recognized and defined as integral components of California’s water infrastructure. The bill would state the particular importance to maintaining the reliability, quantity, timing, and quality of California’s environmental, drinking, and agricultural water supply as climate change advances of source watersheds that supply the majority of the state’s drinking and irrigated agricultural water. The bill would state that the maintenance and repair of source watersheds is eligible for the same forms of financing as other water collection and treatment infrastructure and would specify that the maintenance and repair activities that are eligible are limited to specified forest ecosystem restoration and conservation activities.

Vote: majority Appropriation: no Fiscal Committee: no Local Program: no

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. Section 108.5 is added to the Water Code, to read:

108.5. (a) It is hereby declared to be the established policy of the state that source watersheds are recognized and defined as integral components of California’s water infrastructure.

(b) (1) As climate change advances, source watersheds that provide the majority of the state’s drinking and irrigated agricultural water are of particular importance to maintaining the reliability, quantity, timing, and quality of California’s environmental, drinking, and agricultural water supply.
“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. ...”

### 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>
<th>Estimated floodplain width (m)</th>
<th>Floodplain surface area (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1,570,000</td>
<td>1.6</td>
<td>2,526,130</td>
<td>3</td>
<td>7,578</td>
</tr>
<tr>
<td>2</td>
<td>350,000</td>
<td>3.7</td>
<td>1,295,245</td>
<td>6</td>
<td>7,771</td>
</tr>
<tr>
<td>3</td>
<td>80,000</td>
<td>8.5</td>
<td>682,216</td>
<td>12</td>
<td>8,187</td>
</tr>
<tr>
<td>4</td>
<td>18,000</td>
<td>19.3</td>
<td>347,544</td>
<td>24</td>
<td>8,341</td>
</tr>
<tr>
<td>5</td>
<td>4,200</td>
<td>45.1</td>
<td>189,218</td>
<td>48</td>
<td>9,082</td>
</tr>
<tr>
<td>6</td>
<td>950</td>
<td>103.0</td>
<td>97,827</td>
<td>96</td>
<td>9,391</td>
</tr>
<tr>
<td>7</td>
<td>200</td>
<td>236.5</td>
<td>47,305</td>
<td>192</td>
<td>9,082</td>
</tr>
<tr>
<td>8</td>
<td>41</td>
<td>543.8</td>
<td>22,298</td>
<td>384</td>
<td>8,562</td>
</tr>
<tr>
<td>9</td>
<td>8</td>
<td>1250.2</td>
<td>10,002</td>
<td>768</td>
<td>7,681</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>2896.2</td>
<td>2896</td>
<td>1536</td>
<td>4,449</td>
</tr>
</tbody>
</table>
“…and a potential value of $10,000 per acre per year in ecosystem services provided by swamps and floodplains…”

### Changes in the global value of ecosystem services

<table>
<thead>
<tr>
<th>Biome</th>
<th>Area</th>
<th>Unit values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(e6 ha)</td>
<td>2007$/ha/yr</td>
</tr>
<tr>
<td>Marine</td>
<td>36,302</td>
<td>36,302</td>
</tr>
<tr>
<td>Open Ocean</td>
<td>33,200</td>
<td>33,200</td>
</tr>
<tr>
<td>Coastal</td>
<td>3,102</td>
<td>3,102</td>
</tr>
<tr>
<td>Estuaries</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Seagrass/Algae Beds</td>
<td>200</td>
<td>234</td>
</tr>
<tr>
<td>Coral Reefs</td>
<td>62</td>
<td>28</td>
</tr>
<tr>
<td>Shelf</td>
<td>2,660</td>
<td>2,660</td>
</tr>
<tr>
<td>Terrestrial</td>
<td>15,323</td>
<td>15,323</td>
</tr>
<tr>
<td>Forest</td>
<td>4,855</td>
<td>4,261</td>
</tr>
<tr>
<td>Tropical</td>
<td>1,900</td>
<td>1,258</td>
</tr>
<tr>
<td>Temperate/Boreal</td>
<td>2,955</td>
<td>3,003</td>
</tr>
<tr>
<td>Grass/Rangelands</td>
<td>3,898</td>
<td>4,418</td>
</tr>
<tr>
<td>Wetlands</td>
<td>330</td>
<td>188</td>
</tr>
<tr>
<td>Tidal marsh/Mangroves</td>
<td>165</td>
<td>128</td>
</tr>
<tr>
<td>Swamps/Floodplains</td>
<td>165</td>
<td>60</td>
</tr>
<tr>
<td>Lakes/Rivers</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Desert</td>
<td>1,925</td>
<td>2,159</td>
</tr>
<tr>
<td>Tundra</td>
<td>743</td>
<td>433</td>
</tr>
<tr>
<td>Ice/Rock</td>
<td>1,640</td>
<td>1,640</td>
</tr>
<tr>
<td>Cropland</td>
<td>1,400</td>
<td>1,672</td>
</tr>
<tr>
<td>Urban</td>
<td>332</td>
<td>352</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>51,625</strong></td>
<td><strong>51,625</strong></td>
</tr>
</tbody>
</table>

“...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 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 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 wetlands; now only about half of these important resources remain¹.

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 drained¹, 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 Mall⁴, including the Capitol Reflecting Pool, are located where natural swamps used to be.

¹Trump Pence Make America Great Again. 2017. Infrastructure: Donald J. Trump’s Vision
²National Flood Insurance Program. 2016. Flooding: Our Nation’s Most Frequent and Costly Natural Disaster. March
⁶Humes, D. 2017. “Why do people say the National Mall is built on a swamp?” The Roy Rosenzweig Center for History and New Media and George Mason University.
Budget cutters threaten to end agency’s 115-year tradition of high-quality data

By KENNETH W. COULTON

The USGS, the nation’s leading provider of water data, is facing a funding crisis that threatens its ability to continue providing accurate and reliable data. The USGS, which has a history of 115 years of providing data to support water resource management, faces cuts in its budget that could result in reduced data collection, analysis, and dissemination.

The USGS provides data on water availability, quality, and quantity to support decisions regarding water resource management, including planning, regulation, and compliance with regulations. The USGS also provides data to support research and development, including studies of water use, water quality, and water resources.

However, the USGS is facing budget cuts that could result in reduced data collection and analysis. The agency is currently in the process of developing a plan to address the budget cuts, and it is hoped that this plan will be implemented soon to ensure that the agency can continue to provide high-quality data.

In the meantime, it is important for individuals and organizations to support the USGS by advocating for increased funding and by using the data provided by the agency to support informed decisions regarding water resource management.
Questions?

Kevin Coulton
kevin.coulton@gmail.com