Watershed Council
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CALOOSAHATCHEE RIVER WATCH

Professor William Mitsch was quoted in the News Press article about the C-43 (Caloosahatchee River) West Reservoir. Some excerpts from the article are provided below, along with a handout Prof Mitsch asked be distributed at the public forum.

News Press April 9, 2016 By Chad Gillis

$600M reservoir could hurt rather than help, scientists say

http://www.news-press.com/story/news/2016/04/09/600m-reservoir-could-hurt-rather-than-help-scientists-say/82249058/

Top water quality scientists says the reservoir will turn into a massive algal bloom.

It was supposed to help our river and estuaries but could end up hurting them with toxic algae.

And now some scientists say the $600 million C-43 project to store water for dry season could be a waste of money because it won't clean water and the dirty water it stores could grow far worse as it festers under the Florida sun in shallow pools.

Also, some scientists worry that releasing that water into the river could violate the Clean Water Act standards, which basically say it's illegal to move pollution from one property or water body to another. And U.S. Rep Curt Clawson, R-Bonita Springs, who recently waded in with a new water bill, says spending money on water storage isn't necessarily bad, but doesn't address the key problem: dirty water.

The Caloosahatchee reservoir will take another decade to complete, according to the South Florida Water Management District. But one of the world's top water quality scientists says the reservoir will turn into a massive algal bloom that could become more of a hindrance than a help.

"I can predict 100 percent that that's going to happen," said William Mitsch, a Florida Gulf Coast University professor and world-renowned marine scientist. "You're talking about the same water Lake Okeechobee has released, and you're going to put it in a shallow basin. With shallow lakes, with all the nutrients we have in the water, it's not a good idea."

State engineers, however, say that although algal blooms can happen in any freshwater system, the reservoir will be dynamic, rising and falling as it captures and releases water. "We will measure nutrients in the reservoir, and if we see problems with the water we will address it," said Ernie Marks, Everglades projects manager for the South Florida Water Management District. Marks joined the district in March. "Our hope is that we don't see those kinds of conditions."

But Mitsch isn't the only scientist in Southwest Florida with concerns about the reservoir and what it will look and function like in 2026, when it's scheduled to be completed. "I agree with (Mitsch): there may be clean water limitations," said John Cassani, a retired biologist and chair of the Southwest Florida Watershed Council.

A video statement by Professor William Mitsch may be viewed at:
http://www.news-press.com/videos/news/2016/04/08/82796718/

or by connecting to the QR code:

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Editorial

Restoring the greater Florida Everglades, once and for all

ABSTRACT

The dilemma and ultimate solutions to recent ecological and economic disasters of polluted farm runoff being discharged in the Florida estuaries, described by some as much more severe than anything that happened to Florida's coastline during the 2010 BP oil spill on the Gulf of Mexico, is presented. Two particularly notable episodes have occurred in the last few years. In 2013, 746 million m^3/yr of water from Lake Okeechobee was discharged to the Gulf of Mexico and Atlantic Ocean estuaries, much of it in the summer wet season, with significant ecological disruption on both coasts. In February 2016, an unusually high amount of precipitation in the dry season (>30 cm in January 2015) led to 326 million m^3 of polluted Lake Okeechobee water being discharged to the sea over a 2-week period in early February. The obvious solution to this estuarine pollution is to allow water from the lake to flow to south as it historically did before water management was imposed on the lake and watershed. But that would cause polluted water to flow to the oligotrophic and much treasured Florida Everglades. We estimate that the water quality issue could be solved by creating an additional 40,000 Ha of stormwater treatment wetlands. Those would complement the 23,000 Ha of stormwater treatment wetlands that have already been created. Creating a deepwater reservoir to store the excess water is not a sustainable option.

There is currently major concern being expressed throughout Florida USA about the recent pulses of an excessive amount of polluted farm water from the 1890-km^2 shallow and eutrophic Lake Okeechobee (also known as "Lake O") into the Caloosahatchee River to the west and into the St. Lucie River to the east by the U.S. Army Corps of Engineers. This is part of the scheme for managing hydrology in the 46,000-km^2 greater Florida Everglades, one of the largest wetland restorations in the world (Fig. 1, Mitsch, 2014; Mitsch and Gosselink, 2015).

Both waterways often carry discharged flow seasonally from Lake O to coastal estuaries and eventually to oceanic waters on Florida's coastline. The Caloosahatchee flows west through Ft. Myers Florida to and around Sanibel Island to the Gulf of Mexico. The St. Lucie River flows east to the Atlantic Ocean after passing through significant coastal estuaries on Florida's east coast. As one episode of dramatic coastal pollution, 746 million m^3/yr, or 58% of the 1.28 billion m^3/yr that flowed south into the Florida Everglades, was sent east and west to the sea in 2013 (Fig. 1c), even though precipitation in 2012 and 2013 was at or below normal rates.

A second coastal ecosystem disaster of equal or greater importance occurred in February 2016 when an unseasonable amount of precipitation (>30 cm) fell on south Florida in January 2016. U.S. Army Corps of Engineers preliminary data (http://w3.saj.usace.army.mil/h2o/reports/r-oke.html accessed on 14 February 2016) showed that 236 million m^3 of Lake Okeechobee's polluted water was sent down the Caloosahatchee River toward the Gulf's sensitive coastal estuaries (see Fig. 2) while 90 million m^3 has gone down the St. Lucie to the Atlantic Ocean over a two-week period of January 31 to February 13. The pumping of water to these outlets was deemed necessary because of high Lake Okeechobee water levels, which were, in turn, due to excessively high rainfall events in late January and back-pumping of even more water from flooded farmlands south of Lake O by the state of Florida.

There are several concerns because of this management practice as the Florida Everglades is being restored. First, the agencies in charge of Lake Okeechobee and the Florida Everglades, who have been working on the Everglades Restoration for 20 years, still do not have a plan in place when unusual flooding events happen such as this excessive rainfall in south Florida's so-called "dry season." This is when the downstream estuaries are particularly vulnerable to pollution and it is certainly when all of the tourists are in Florida to see this pollution. Whether the excessive precipitation in January is simply an aberration in our weather or reflects uncertainties in weather caused by climate change is irrelevant. There should have been a plan in place and they were told to have a "climate-change" program in place by the U.S. National Academy of Science's National Research Council (2014).

A second concern is that this episode puts south Florida in a no-win situation because if all of that water is discharged south instead of east and west, it would give a major pulse of dirty water to our very clean and precious Florida Everglades. That too would be unacceptable.

So what is the solution to this dilemma of nobody wanting what is, in the end, a valuable resource – freshwater – that should not be sent out into the ocean?

The general consensus that has been more or less agreed to for a decade or more for the Florida Everglades $20 billion restoration is that the water in Central Florida, starting with the Kissimmee River that originates in the Orlando metropolitan region and that then flows into Lake O, needs to continue on its north to

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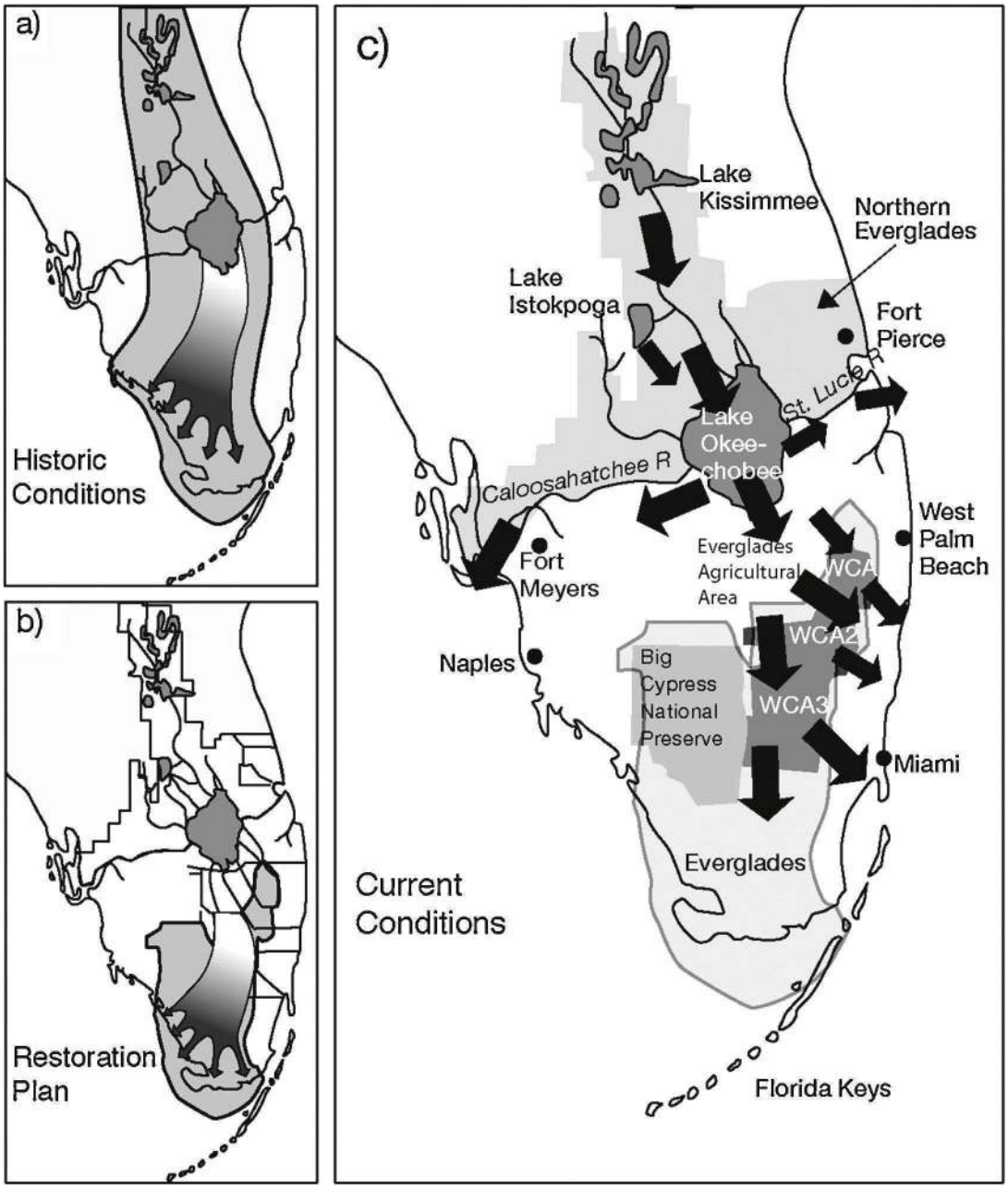

Fig. 1. Illustrations of Florida Everglades wetland restoration: (a) historic conditions of the Florida Everglades hydrology in pre-settlement times; (b) the flow conditions desired when the Everglades is restored; (c) current flow conditions in water years 2012 and 2013 in the Everglades (from SFWMD, 2014) where much of the water is still sent east and west to the sea rather than south to the Everglades (diagram from Mitsch and Gosselink, 2015, reprinted with permission John Wiley & Sons, Inc.).

south trajectory to and through the Florida Everglades (Mitsch and Gosselink, 2015). The quandary is simply that it is much too polluted freshwater directed to the oligotrophic Everglades. That is ironic because, probably in the not too distance future, south Florida may be faced with extreme seasonal water shortages.

The state of Florida has created or restored about 23,000 ha of wetlands (they are referred to as stormwater treatment areas or STAs) south of the farm fields below Lake O to remove phosphorus from the water that drains from the lake and especially through the sugar fields and farmlands south of the lake. Phosphorus is the main pollutant feared in the Everglades because of the ecological changes that it causes in the Florida Everglades vegetation and soils (Koch and Reddy, 1992). The created/restored wetlands (STAs) have been effective in significantly reducing phosphorus concentrations before the water is discharged to the Everglades, some for many years (Pietro and Ivanoff, 2015; Chen et al., 2015). Also, preliminary mesocosm studies have indicated that concentrations as low as 10 ppb of total phosphorus in the discharge of these wetlands could be possible if the correct soils, vegetation, and hydrologic conditions are maintained in treatment wetlands (Mitsch et al., 2015).

We need to think outside of the box we are in. If 23,000 ha are wetlands are solving the water quality problem with the water that is currently flowing to the Everglades from this agricultural area, then an additional 40,000 ha of treatment wetlands or even more are needed to serve as a filter for the water flowing toward the Everglades to temporarily store and ultimately clean up stormwater

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Fig. 2. Photo taken in February 2016 of polluted freshwater from Lake Okeechobee in south central Florida (in lower half of picture) flowing through the estuary around Sanibel Island (on the right side of photo) and toward the Gulf of Mexico (in the top of the picture) on Florida's southwest coastline near Ft. Myers, Florida, USA.

from events like the January–February 2016 excessive rainfall/Lake O discharges. These filter marshes have been proved to work on a large scale.

The idea of creating a lake-like reservoir for water storage now being discussed as a possible solution to these excessive discharges to the estuaries and sea is not a good idea. Such a reservoir will become a eutrophic lake with excessive algal blooms within a few years and would then become another management headache rather than a solution. The ecological principle here is simple. Wetlands are meant to have plants and be green and can adsorb the excessive fertilizers. Lakes and estuaries are not appreciated when they are green with excessive algae. We need to look no further than Taihu in China, Lake Erie in the Laurentian Great Lakes, and even Lake Okeechobee in Florida to know that.

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