

Florida Bay Algal Blooms

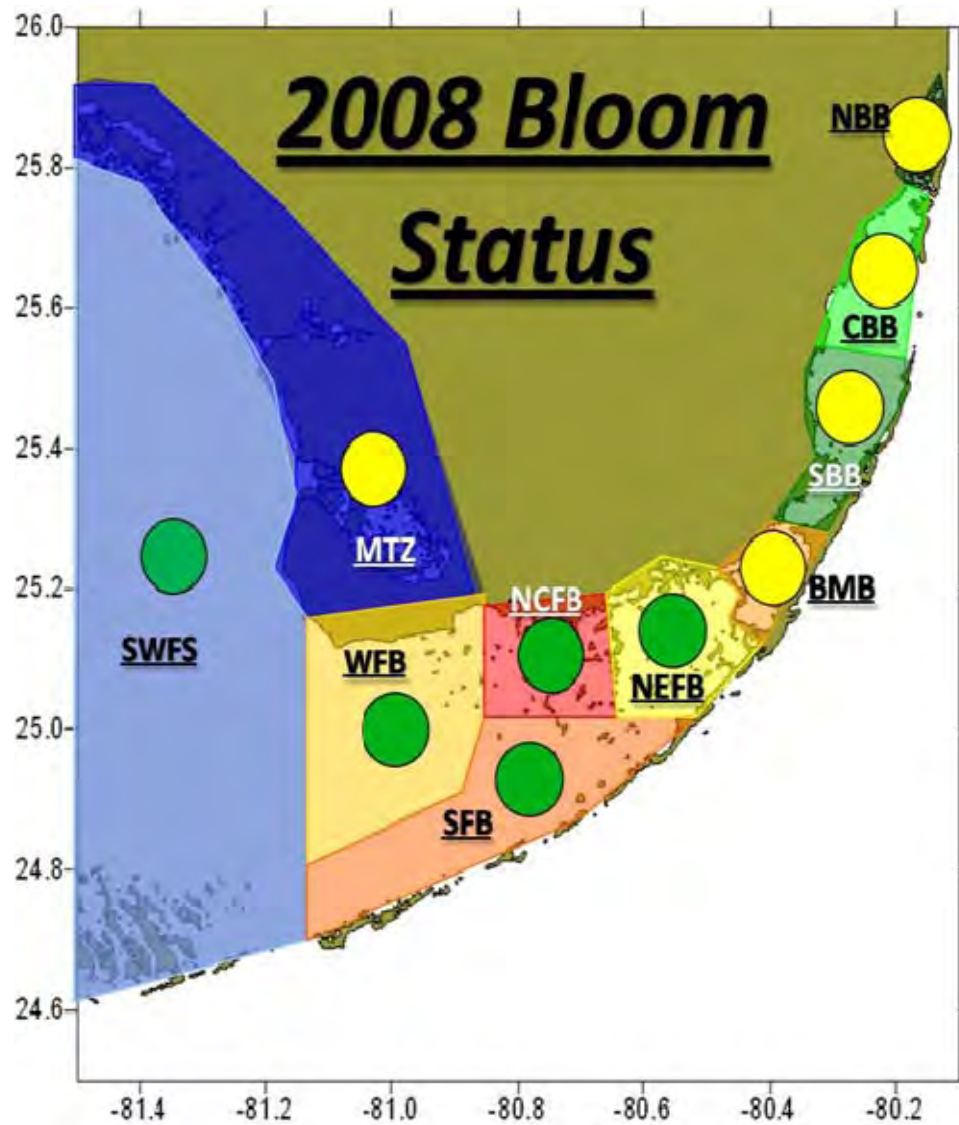
Summary Findings

Elevated nutrients from the active 2005 hurricane season resulted in algal blooms in many sub-regions of the southern coastal system (SCS) in 2006 and 2007. These blooms have since subsided and many sub-regions returned to green condition in 2008. This may have been in part due to the drought lowering freshwater flow and thus nutrient loading to the SCS during 2008. As the drought lessens and rainfall increases, it is expected that more sub-regions may receive a yellow condition. If water flows to the SCS are improved and there is not significant hurricane activity, this indicator could return to predominantly green for all sub-regions. If water flows do not improve, many areas will be predominantly yellow.

Key Findings

1. The majority of sub-regions assessed had significant algal bloom activity in 2006 that appears to have been predominantly influenced by the active 2005 hurricane season aggravated for eastern Florida Bay by road construction on US-1.
2. The majority of sub-regions assessed had chlorophyll-a and algal blooms rated as good (green).
3. The sub-regions assessed where chlorophyll-a was higher than the median do not appear to be indicative of long-term negative trends.
4. Overall excess nutrients (eutrophic expressions) were geographically minimal and appear to be explainable from existing phenomenological conditions of hurricane activity exacerbated by road construction along US-1 in Barnes, Manatee, and Blackwater Sounds (BMB).
5. If water flows are improved, the SCS water quality could improve and the magnitude and frequency of algal blooms could diminish.
6. Monitoring of BMB was critical to detect and quantify the impacts of road construction along US-1. This short duration disturbance resulted in a multi-year algal bloom that as of 2008 had not returned to background conditions.
7. Although the BMB algal bloom lasted several years, there is the possibility that its ecological consequences, including the loss of benthic grazers, could last for decades and leave the area more susceptible to future algal blooms.
8. Monitoring long-term consequences of nutrient releases into the SCS from both natural (e.g., hurricanes) and human causes (e.g., road construction) and their interactions with hydrological restoration (e.g., more freshwater flow into the SCS, particularly Florida Bay) are critical to continuing the evaluation and assessment of restoration.

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Map of the SCS with stoplight ratings by sub-region.

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Zone/ Performance Measure	'06	'07	'08	2-YEAR PROS- PECTS	CURRENT STATUS	2-YEAR PROSPECTS
Chlorophyll a BARNES, MANATEE & BLACKWATER SOUNDS (BMB)					This sub-region experienced an unusual cyanobacterial bloom in 2006. The bloom was initiated by a large spike in phosphorus from a combination of highway construction and canal releases in response to the active hurricane season. Through 2008, this bloom has decreased, but chlorophyll concentrations have not returned to previous levels.	We expect that this area will return to its green condition that existed from 1995 until 2006 as both chlorophyll a and nutrients have been consistently declining from their peak in 2006.
Chlorophyll a NORTHEAST FLOR- IDA BAY (NEFB)					The cyanobacterial bloom from Barnes, Manatee, and Blackwater Sounds no longer propagates into this sub-region causing this sub-region to remain highly oligotrophic.	The persistent green condition for this sub-region of the bay depends on water management activities in the C-111 basin and Taylor Slough.
Chlorophyll a NORTH-CENTRAL FLORIDA BAY (NCFB)					The current status is due to the lack of a seasonal cyanobacterial bloom in both 2007 and 2008. These blooms do not appear every year, but have occurred intermittently over the past 15 years.	If water management improves flows of water to Florida Bay via McCormick Creek it is expected that this cyanobacterial bloom could become less frequent and pronounced.
Chlorophyll a SOUTH FLORIDA BAY (SFB)					The current status is green and reflects the absence of the cyanobacterial bloom extension from the north-central sub-region during 2008. This has occurred intermittently over the past 15 years and is expected to continue to do so in future, especially after the passage of hurricanes.	If water management improves bloom conditions in the north-central sub-region, it is likely the north-central bloom will rarely extend into this sub-region.
Chlorophyll a WEST FLORIDA BAY (WFB)					Since 2006, the seasonal diatom blooms in this sub-region have not been as dense or widespread as in the past.	This sub-region is influenced primarily by Shark Slough outputs and southerly transport of Gulf of Mexico water along the SW Florida Shelf. Conditions are therefore dependent on external forcing, as well as water management along the southwest coast.

The 2-Year Prospects forecast assumes that no large-scale hydrological restoration projects are implemented during this time period, which would result in significant ecological response of this indicator. The occurrence of significant climatological events during this period may affect the forecast.

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Zone/ Performance Measure	'06	'07	'08	2-YEAR PROS- PECTS	CURRENT STATUS	2-YEAR PROSPECTS
Chlorophyll a MANGROVE TRANSI- TION ZONE (MTZ)					The chlorophyll concentrations were slightly higher in this sub-region during 2008. This concentration was not significantly above the baseline and is unlikely to indicate a negative long-term trend.	Without any major hurricanes, it is expected that this sub-region will remain yellow due to seasonal diatom blooms.
Chlorophyll a SOUTHWEST FLOR- IDA SHELF (SWFS)					The chlorophyll concentrations were slightly higher in this sub-region during 2006, but have since decreased likely in part due to the droughts decreasing fresh-water flow to the southwest Florida shelf and minimizing the seasonal diatom bloom.	This sub-region is influenced primarily by Shark Slough outputs and southerly transport of Gulf of Mexico water. As rainfall increases from the drought of 2008, diatom blooms may increase in this sub-region.
Chlorophyll a NORTH BISCAYNE BAY (NBB)					The chlorophyll concentrations have been slightly higher in this sub-region since 2006. However, concentrations were not significantly greater than baseline for any of the three years.	Without any major hurricanes, it is expected that this sub-region will remain yellow.
Chlorophyll a CENTRAL BISCAYNE BAY (CBB)					The chlorophyll concentrations have been slightly higher in this sub-region since 2006. However, concentrations were not significantly greater than baseline for any of the three years.	Without any major hurricanes, it is expected that this sub-region will remain yellow.
Chlorophyll a SOUTH BISCAYNE BAY (CBB)					The chlorophyll concentrations have been slightly higher in this sub-region since 2006. This area was influenced by periodic expansion of the cyanobacterial bloom from Barnes, Manatee, and Blackwater Sounds into this sub-region in 2006. However, concentrations were not significantly greater than baseline for any of the three years.	Without any major hurricanes, it is expected that this sub-region will remain yellow.

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