Outlook

RE: Coral 11 and Shrimp 12 - current and sediment information

From johnkreed48@gmail.com <johnkreed48@gmail.com>
Date Thu 8/7/2025 9:36 AM
To Kathleen Howington <Kathleen.Howington@safmc.net>

August 7, 2025

Thank you Kathleen for your questions.
That Summary report compiled a summary of research studies completed from 1970 to 2006.
My growth rate studies of the coral at 80 m depths and 6 m depths used the current, temperature and light data to study how all these factors affect the coral growth rate which is very slow at 80 m, about ½" a year.

As I mentioned in my report to the Council I had current meters on the bottom at 80 m depths (deep Oculina mounds), mid shelf 40 m, and inshore 6 m. The current meters recorded speed and direction of the currents, 24 hours a day, 7 days a week, for a year.
We found that at the deep water reef sites the bottom conditions and current were completely different from the surface north flowing Gulf Stream. Below depths of 50-60 m the currents are primarily driven by the cold upwelling of water from the Straits of Florida, moving west up the slope, onto the deep reefs. So the current is always westerly. It is also nutrient rich which lead to plankton blooms and the bottom nepheloid layer. This layer of nutrient rich water with POM, particulate organic matter, is critical to the survival of the coral. Probably why the banks formed here starting over 1000 years ago. This POM is not sediment.

Here is what I submitted as comment regarding currents and sediment.
Please write if you have any further questions.
John Reed

August 5, 2025
Re: OHAPC proposed Coral Amendment 11/ Shrimp Amendment 12_Sedimentation from Trawling and Currents

The Oculina reefs are probably one to the best studied deep-water reefs in the world. We have detailed knowledge of the fish communities, and communities of animals that live in the coral habitat; studies of the coral reproduction; long term studies of the currents on these shelf edge reefs; studies of the geology and oceanography of these reefs (DEEP-WATER *OCULINA* REEFS OF FLORIDA: SUMMARY OF THE STATE OF KNOWLEDGE OF THE HABITAT, FAUNA, GEOLOGY, AND PHYSICAL PROCESSES OF THE ECOSYSTEM; Report to SAFMC 2006).

We had current meters and temperature recorders on the shelf-edge Oculina reefs at 80 m depths, mid-shelf (42 m), and inner reefs (6 m) which continuously recorded currents and temperatures, 24 hr a day, 7 days a week for over a year. The bottom currents and conditions on the deep-water Oculina reefs are often quite different from the surface water which is affected by the meandering of the Gulf Stream. The surface currents at the shelf-edge are typically to the North. However at depths of 150 ft and below we documented that the bottom currents have a E-W tidal component which moves water, coral larvae, and juvenile fish onto the shelf. Also there are monthly upwellings of water from the Straits of Florida onto the shelf. These push bottom water to the west onto the shelf. Reed (1981) showed that these upwelling events occur at the shelf edge Oculina reefs throughout the year. This also would push any sediment plumes from bottom trawling onto the shelf and over the reefs. These upwelling events occur throughout the year at the shelf edge but only move all the way to shore in the summer. These westerly tides and currents also help move the juvenile fish from groupers spawning on the deep-water reefs onto

the shelf and into their nursery grounds, the grassbeds and mangroves of the Indian River Lagoon. Here they grow up until ready to move back offshore to the deep-water Oculina reefs to spawn as adults 15 years later. The fragile Oculina coral larvae also move onto the shelf in these westerly currents. We also had detailed long-term studies documenting the sediments associated with the deep-water Oculina reefs, and the shelf slope east of the reefs. These show a high content of mud (silt and clay) which would be easily suspended by bottom trawling.

- Sedimentation is known to stress corals which do not need another stress factor. Increased sedimentation can cause smothering and burial of coral polyps, shading, tissue necrosis, and reduces recruitment, survival, and settlement of coral larvae (Erftemeijer et al. 2012). Sedimentation can affect coral physiology and reproductive health (Dr. Joshua Voss, FAU, pers. comm.). Planula larvae of coral are released into the water column where they live for weeks or more before they settle (Brooke 2002). Sediment plumes from trawling could prevent baby coral recruits from settling; coral recruits are particularly susceptible (Fourney and Figueiredo 2017).
- Sediment plumes can also create conditions for coral diseases to thrive. For example, researchers in the Great Barrier Reef found a significant, positive relationship between overall coral disease prevalence and the length of time that a reef was exposed to sediment plumes (Pollock et al. 2014).

We do not need more studies of the currents, sediments and impacts of trawling on deep-water reefs. These are all well documented. Bottom trawls have been banned from the OHAPC since 1984 and makes no sense to open up portions of the OHAPC now for “allowable” trawling.

John Reed
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From: Kathleen Howington <Kathleen.Howington@safmc.net>
Sent: Wednesday, August 06, 2025 2:55 PM
To: John Reed <johnkreed48@gmail.com>
Cc: Allie Iberle <allie.iberle@safmc.net>; Myra Brouwer <Myra.Brouwer@safmc.net>
Subject: Coral 11 and Shrimp 12 - current and sediment information

Dr. Reed

Thank you for your comments last night. As always, I appreciate your expertise. I have reviewed the document that you referred to in your comment:
https://safmc.net/documents/attach2_habitatapnov122006oculinaresearchsummaryreport-1970-2006-pdf/

> 06 Oculina Research Summary Report- 1970-2006 - SAFMC
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> August 18, 2006 Fig. 1. Light shaded area: 1029 km2 (300 nm2) deep-water Oculina Marine Protected Area (MPA) off eastern Florida. The original 315 km2 (92 nm2) Oculina Habitat of Particular Concern (OHAPC) that was designated in 1984 (also known as the Experimental Oculina Research Reserve) is indicated by the boxed area (1995 sidescan sonar coverage) that extends from the Sebastian Reef area ...
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Can you clarify what you said last night about the current running east to west over the coral? I'm reading that there is a nephloid current past 60m depth, and i see the speed of the bottom current, but not the direction.

Have a great day and thank you for your time.

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