

SOUTHEAST FLORIDA ACTION NETWORK (SEAFAN)

Community-Based Reporting and Response to
Marine Incidents in Southeast Florida

Summary Report July - October 2012

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accumulated debris. By increasing awareness and improving reporting and cleanup efforts, the Marine Debris Program seeks to minimize the impacts of marine debris on coral reefs.

Southeast Florida Marine Event Response Program (SEMERP)⁴

An expansion of Mote Marine Laboratory's Marine Ecosystem Event Response and Assessment (MEERA) program in the Florida Keys National Marine Sanctuary, SEMERP provides for the early detection and assessment of biological incidents occurring along the northern portion of the Florida Reef Tract.⁵ Upon notification of a possible biological disturbance event, FDEP CRCP will coordinate with regional partners to schedule initial site assessments, implement event response protocols, and analyze samples, where possible and appropriate. The goal of this program is to assist with efforts to assess and monitor events as they develop, thereby helping scientists to better understand the nature and causes of marine events, and allowing resource managers to create better strategies for protecting southeast Florida's marine resources.

Reef Injury Prevention and Response (RIPR) Program⁶

The RIPR program was designed to minimize coral reef injuries resulting from vessel impacts such as grounding, anchoring, and cable drag events. The primary objective of this program is to develop management actions to raise awareness and prevent coral reef injuries associated with commercial and recreational vessels. Where damages to reef resources do occur, RIPR seeks to ensure that resource managers are informed so that, if necessary, they may coordinate a response, implement the appropriate restoration or mitigation activities, and ensure that those responsible for the damages are held accountable in accordance with the Coral Reef Protection Act (CRPA).⁷

Methods

SEAFAN promotes the transfer of information between local reef users, coral reef managers, and scientists on the condition of southeast Florida's reefs. The reporting aspect of the program relies on an "Observer Network" composed of people who regularly observe the condition of the marine environment, including divers, fishermen, boaters, resource professionals, and anyone else who spends time on the ocean. As the program's motto "We're All Connected, Keep It Protected" implies, SEAFAN aims to harness the collective power of the people who spend time on the water and rely on its resources to become involved in coral reef conservation by reporting marine incidents. This information assists scientists and resource managers in capturing information about the frequency, distribution, extent, and duration of a variety of marine incidents. SEAFAN collects reports of marine debris, vessel groundings, anchor damage, invasive species, harmful algal blooms, fish disease and fish kills, discolored water, coral disease and bleaching, the presence of extreme thermoclines, or anything that is obscure, out of the ordinary, or that may have an impact on the coral reef ecosystem (Figure 2).



Figure 2. Marine incidents to report.



Figure 3. Primary reporting mechanisms for SEAFAN.

Reports are submitted primarily via two reporting mechanisms: a toll-free hotline telephone number (866-770-SEFL) and an internet-based report form (www.SEAFAN.net), but are also accepted via email, in person, or by any other means (Figure 3). FDEP CRCP staff also actively monitor regional news and environmental conditions for information that may be relevant to the coral reef ecosystem. All reports are logged into a comprehensive marine incident database and evaluated, and the information is forwarded to the appropriate government agencies, non-profit organizations, and academic institutions with an interest in any particular incident. If necessary, FDEP CRCP will assist in coordinating a response to any reports that indicate a significant impact to the coral reef ecosystem.

Regardless of the incident and subsequent response, all reporters who choose to receive additional correspondence regarding their report receive a certificate of appreciation and a personal follow-up response thanking them for participating in SEAFAN. To the extent that additional information is available, they also receive an explanation of the incident they observed, a description of the response actions that are underway, and any additional knowledge gained as a result of the report. Through this follow-up, SEAFAN seeks to create a more informed group of stakeholders who are engaged in coral reef conservation and will continue to report in the future.

SEAFAN is unique in that it is specific to marine resources in southeast Florida, accessible, allows a wide variety of incidents to be reported through common reporting mechanisms, and encourages open communication between stakeholders, researchers, and resource managers. Combined, these activities increase the amount of information available about the condition of southeast Florida's reefs and promote awareness about when and where episodic events or other incidents that may impact the reef are occurring, which will ultimately help improve coral reef conservation and management.

Results: July - October 2012

During the four month period between July 1, 2012 and October 31, 2012, SEAFAN received a total of 13 reports from the telephone hotline and internet report form, of which 2 arrived via the hotline, and 11 were submitted through the online form. An additional 6 reports relevant to SEAFAN were received by FDEP CRCP via email and were subsequently documented in the SEAFAN database. Sources of the reports included recreational divers and dive operators, environmental non-profit organizations, researchers, residents, and visitors. Incident locations included Miami-Dade, Broward, and Palm Beach counties within the southeast Florida region, while three reports were outside of the region in Monroe County. Reports submitted during this time period include anchor damage, coral bleaching, discolored water, fish kills, invasive species, marine debris, thermoclines, and 'other' incidents (Figures 4 and 5).

Report Type	#
Anchor Damage	2
Coral Bleaching	1
Discolored Water	1
Fish Kills	3
Invasive Species	3
Marine Debris	3
Thermoclines	3
Other Incidents	3
Total	19

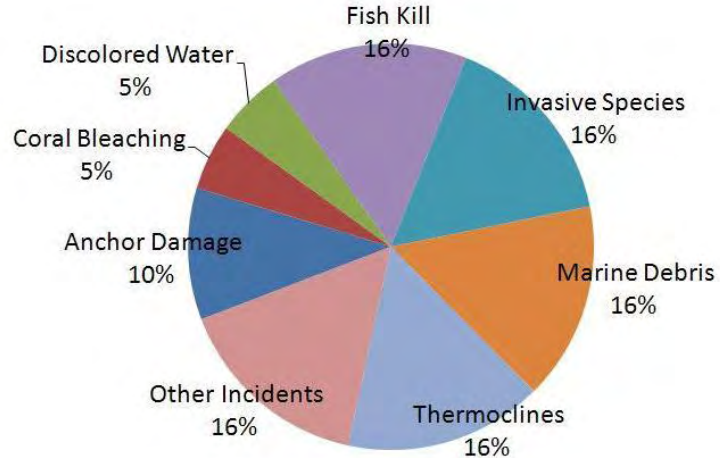


Figure 4. SEAFAN reports by category, received July 1, 2012 – October 31, 2012.

None of the reports received during this reporting period indicated an emerging, significant threat to the coral reef ecosystem or required an extensive response. The following is a summary of the reports and follow-up activities between July 1 and October 31, 2012.

Anchor Damage

Reports of recreational vessels anchored on coral reef habitat were forwarded to the RIPR Coordinator, after which no further response was necessary through SEAFAN. Of the two reports, one incident took place in Palm Beach County, while the other was located outside of the region in Monroe County. A point of contact was identified in Monroe County, to whom any future reports of anchoring incidents in that region will be forwarded. As a first time offender, the owner of the vessel reported in Palm Beach County was issued an educational letter about their violation, including information about the Coral Reef Protection Act (CRPA), Section 403.93345, Florida Statute (F.S.), how anchoring on coral habitat damages the reef, and mooring buoy locations in southeast Florida.



Figure 5. Marine incidents reported to SEAFAN between July 1 and October 31, 2012 in Miami-Dade, Broward, and Palm Beach counties. Note: Some locations are approximations, based on site descriptions.

Coral Bleaching

Information from the NOAA Coral Reef Watch (CRW) bleaching early warning products, BleachWatch Current Conditions reports in the Florida Keys National Marine Sanctuary, and the preliminary results from the Florida Reef Resilience Program (FRRP) 2012 Disturbance Response Monitoring (DRM) surveys across the entire Florida Reef Tract suggests that 2012 was a mild bleaching year.^{8, 9, 10, 11} Only one bleaching report was submitted to SEAFAN during this reporting period, forwarded to FDEP CRCP via email by a third party. Although the amount of information supplied about the incident was limited, available evidence indicates that the bleaching was likely a response to cold water offshore of Palm Beach County during the previous week.

Discolored Water

One discolored water report received pertained to a prolonged period of dark water originating from Port Everglades Inlet in Broward County. This event was attributed to severe weather, as heavy rains associated with Tropical Storm Isaac flooded southeast Florida and resulted in the subsequent deluge of runoff from the inlets during high tides. Although not reported to SEAFAN, similar outflows occurred through the St. Lucie Inlet in Martin County as a result of water releases from Lake Okeechobee.

Good water quality is essential for a healthy coral reef ecosystem, and discolored water is often a sign of poor water quality. While polluted stormwater flowing from the inlets during rainy season in southeast Florida is a relatively common occurrence, discolored water can also be triggered by untreated or poorly treated sewage, sediment runoff, and seepage from contaminated groundwater, among other sources.

Fish Kills

Of the three fish kills reported, all displayed only localized affects and were not indicative of a significant, large scale event. One incident was reported to SEAFAN via the online form and forwarded to the FWC Fish Kill Hotline.¹²



Figure 6. Image submitted with a fish kill report received by SEAFAN during the July 1 - October 31, 2012 reporting period.

The report pertained to numerous dead mullet, barracuda, skip fish, and bait fish along the beach, and included images showing a large amount of beach wrack and debris in addition to the dead fish (Figure 6). This information led to the conclusion that severe weather, caused by a prolonged period of high winds offshore of southeast Florida during the preceding week, caused the fish kill.

Two additional fish kill reports were received via email, forwarded by a third party. While information available on the events was limited, the reporters noted that several dead tangs and angelfish were observed, and that water

temperatures in the area ranged between 51 and 53°F. This information was reported to FWC, who confirmed cold water upwelling as the suspected cause of the incident.

Invasive Species

All invasive species reported during this time period concerned lionfish (*Pterois sp.*) sightings (Figure 7). These observations were added to the SEAFAN database and, to the extent that sufficient information was available, were also reported to the Reef Environmental Education Foundation (REEF) which automatically transfers all reports to the United States Geological Survey (USGS) Non-Indigenous Aquatic Species (NAS) Program.^{13, 14} This information is important to help track the spread of invasive species. As more lionfish reports are received in southeast Florida, they may also assist in identifying sites for future lionfish roundup events.



Figure 7. Lionfish observed on a southeast Florida reef.

Marine Debris

Of the three marine debris reports received between July 1 and October 31, 2012, one each was received via the telephone hotline, online form, and email. All reports were added to the database, although none were immediately actionable through SEAFAN. One report was located out of the SEAFAN jurisdiction in the Intracoastal Waterway in Broward County, while another concerned tires resting along the Port Everglades channel. The remaining report involved lobster traps along the reef. This information was forwarded to the FWC Division of Marine Fisheries Management, but no further action was possible because the traps were fishable and observed during open season for the spiny lobster fishery. While it is illegal to tamper with any part of a trap, additional reports of traps that are or may become lost or abandoned may facilitate the future organization of permitted derelict trap retrieval efforts.

Although it is unrealistic to organize a response effort for each individual marine debris report, these reports are still important for determining the extent of the marine debris on southeast Florida reefs. As the marine debris program continues to develop, this information will help identify priority areas for future reef cleanup efforts.

Thermoclines

An out of place or unusually strong thermocline may indicate the presence of an upwelling event in which cold, nutrient-rich subsurface water is transported to shallower depths. This information is important to scientists at NOAA's Atlantic Oceanic and Meteorological Laboratory (AOML) and others who are studying the dynamics of upwelling events as measured by temperature, as well as the flux of nutrients into the coastal environment during these phenomena. SEAFAN thermocline reports help alert researchers about when and where episodic upwelling events might be occurring, so that they will be able to sample the nutrients present in the water. A total of three thermocline observations were reported to SEAFAN

during this reporting period, all in Palm Beach County. The information provided in the reports was forwarded to key researchers studying nutrient influxes into southeast Florida's coastal waters, although no sampling response has been coordinated thus far.

Other Incidents

Three 'other incident' reports were submitted to SEAFAN between July and October, 2012. The first report noted a missing mooring buoy with unsecured line and piles of broken staghorn coral (*Acropora cervicornis*) at a dive site in Miami-Dade. The information was referred to the Miami-Dade County Department of Regulatory and Economic Resources (RER) who responded, confirmed that the buoy downline and shackle were not impacting the reef, and scheduled the mooring buoy to be replaced during the next maintenance period the following month. They also confirmed that the broken coral at the site was 'old dead' rubble that results from the natural occurrence where fragments break off, roll across the reef, and get caught in ledges. No further action was required for this report.



Figure 8. A giant barrel sponge observed with sponge orange band disease in Palm Beach County.

The second incident report was an email forwarded to FDEP CRCP, FWC, and Nova Southeastern University (NSU) researchers, which included information about an observed occurrence of sponge orange band (SOB) disease on a giant barrel sponge (*Xestospongia muta*) in Palm Beach County (Figure 8). In April and May 2012, prior to the initiation of SEAFAN, a disease outbreak on giant barrel sponges spread rapidly across the FRT, which prompted several response activities, including field surveys to determine the extent of the disease and percent mortality, and tissue sampling by NSU researchers to attempt to identify a pathogen. While this single report does not signify a new emerging threat, additional reports indicating that the SOB disease is becoming epidemic again will elicit further response activities.

The final report submitted was outside of the southeast Florida region in Monroe County. The reporter, who inquired about boat sewage discharge, was referred to FWC.

Discussion

By facilitating the reporting and response to marine incidents, SEAFAN seeks to help resource managers and scientists determine the status of the coral reef ecosystem, identify trends, and increase the overall understanding about the causes and consequences of marine events, information that is essential to improving coral reef management in the region. Although the 19 reports received between July 1, 2012 and October 31, 2012 are not enough to reveal the precise status of coral reefs and definite trends in the coastal marine environment, they still provide general insight about the various types of incidents that impact coral reefs.

Marine debris and anchor damage reports provide an indication about the frequency, distribution, and extent of impacts, as well as who may be responsible, information that is critical to mitigating these threats. Marine debris data can help identify areas that tend to accumulate large amounts of smaller debris, which will help inform site selection for future

volunteer-based reef cleanup events. In the future, FDEP CRCP also hopes to expand its marine debris removal efforts by contracting organizations with the necessary expertise and equipment to assist in the removal of large debris that is directly impacting the reef. Finally, depending on the types of debris reported and its distribution, in some cases this data may also help identify the likely sources of debris, which provides a first indication as to which management actions may prove the most useful in reducing the amount of debris that enters the marine environment in the first place. For example, debris composed mostly of beverage bottles and cans suggests that improvements in land-based waste management and recycling may be effective in reducing the amount of trash that ends up on the reef.¹⁵

Similarly, reports of vessels anchored on the reef provide information about the distribution and frequency of anchoring impacts across southeast Florida’s reefs. These reports also allow the responsible parties to be identified and educated about the CRPA, which will help protect coral reefs by deterring those individuals from additional anchoring incidents. Subsequent violations of the CRPA by the same vessel will result in a warning letter and a fine per Section 403.93345(8)(a), F.S. of the CRPA, which provides additional incentive to avoid a repeat offense.⁷

Finally, while none of the biological incident reports received during this reporting period indicated a significant event that warranted a comprehensive response effort, the spatial and temporal distribution of these events suggests that some were likely not isolated incidents (Figures 5 and 9). In fact, five of the reports appear to be correlated, including two thermocline

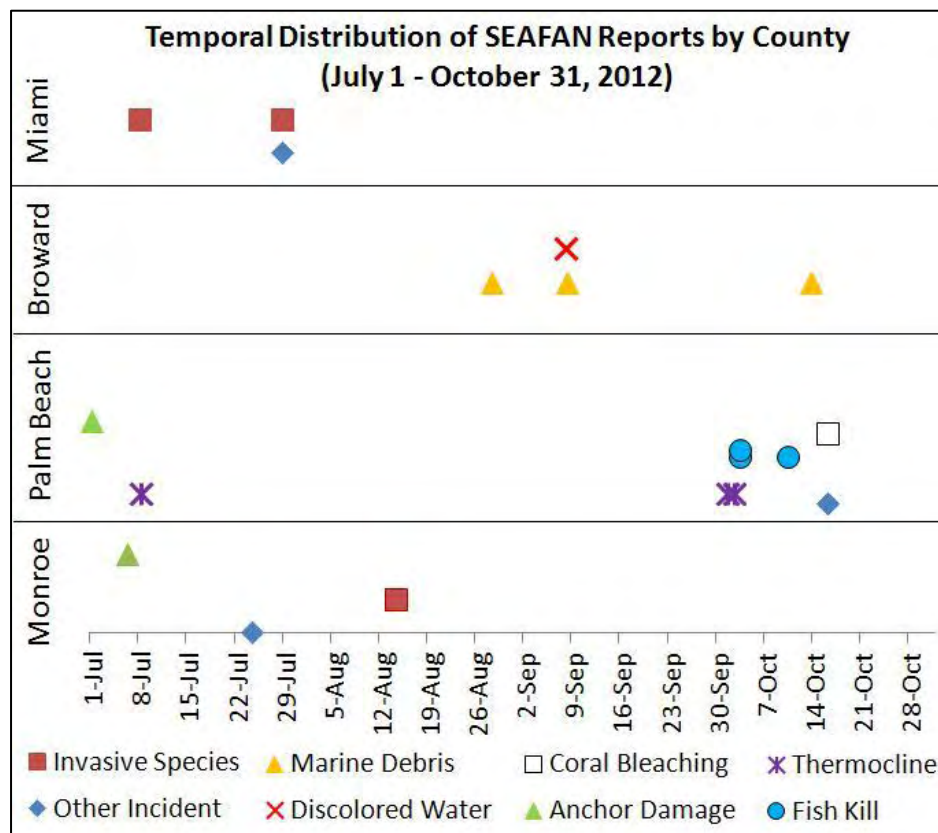


Figure 9. SEAFAN reports received by county and date. Thermoclines reported in Palm Beach County in early October were the likely cause of fish kills and a coral bleaching event.

reports, two fish kill reports, and the single coral bleaching report. The thermocline reports documented the presence of cold water off the coast of Palm Beach County in early October, which was also implicated as the likely cause of the fish kills and coral bleaching.

While no other obvious associations appear among the remaining biological incident reports, it is possible that additional patterns would emerge with more reports. For example, although no fish kills or bleaching reports were submitted in early to mid-July following the first thermocline report, other incidents may have been triggered as a result of the cold water that were not captured by SEAFAN. Similarly, the discolored water originating from the Port Everglades and St. Lucie inlets may have had unidentified consequences for the coastal marine ecosystem. Several studies have discovered that freshwater releases into the marine environment negatively affect coral health as prolonged exposure to turbid, nutrient-rich, low-salinity water increases corals' susceptibility to bleaching.^{16, 17, 18} Thus, while the location and timing of the October thermocline and bleaching reports imply a connection, in reality coral bleaching can occur as a result of a number of environmental issues, and the report submitted to SEAFAN could have been the result of some other, unidentified factor. While it is difficult to pinpoint a specific factor as the cause of any particular marine incident, more reports submitted to SEAFAN and subsequent sample analysis may help to illuminate the causal factors of marine incidents, and the relationships between incidents and impacts to the coral reef ecosystem.

Conclusion

As SEAFAN was launched in July 2012, the primary focus during this reporting period was to begin disseminating information about the program to the residents of southeast Florida, while also identifying the key agencies, organizations, and other contacts with whom a response may be coordinated. While the small number of reports reflects the infancy of SEAFAN, this still represents a marked increase compared to the number of reports received prior to the program's inception.

Outreach efforts and network capacity building will continue in the next reporting period, and response protocols will be further refined. As SEAFAN becomes better established, it is expected that the residents and visitors of southeast Florida will have an increased willingness to participate in the program and that the number of reports received will increase. Furthermore, increased awareness and reporting through SEAFAN's established reporting mechanisms (hotline and online form as opposed to email) will improve consistency in reports and the quality of information gathered. As the frequency, distribution, and quality of reports increases, SEAFAN is expected to develop into a viable early warning system which will assist the scientific community with a better understanding of the distribution, causes, and consequences of marine incidents in southeast Florida.

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