Crown of Thorns Aggregation Monitored on Kona Coast

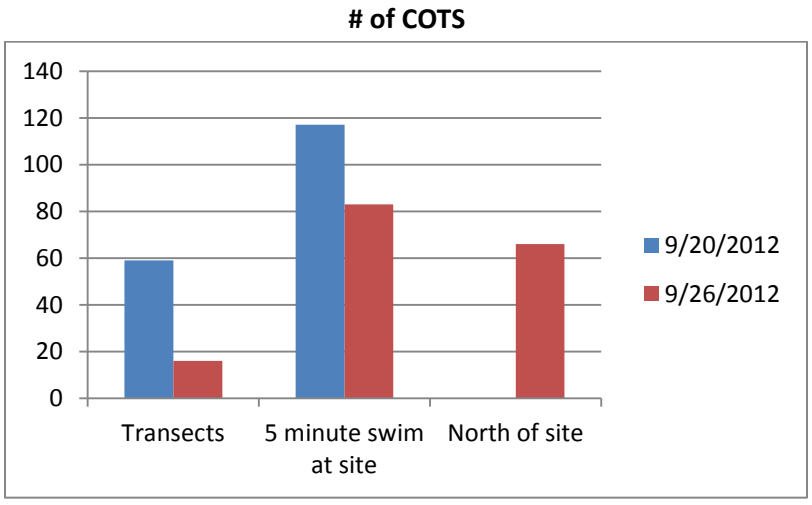
Late in September 2012, an aggregate of Crown-of-thorn seastars (COTS) was discovered at a West Hawaii Aquarium Project (WHAP) site on the Kona Coast near Kaupulehu during field work being conducted by a Division of Aquatics Resources (DAR) survey team.

One week later, a scheduled fish survey was conducted at the same site. As part of the survey, COTS were counted on 4 permanent 25m x 2m transects. To further assess the extent of the outbreak, four divers spaced approximately 10m apart at depths from 8m to 20m swam north from the site and conducted a 5 minute swim counting all COTS within a 5m belt. Because of the higher than usual COTS numbers on the transects and the 5 minute swim, the team returned to the site on September 26, 2012 to further assess the outbreak with rapid response protocol.

The transect COTS counts were repeated to compare to the previous week, then all COTS coral scars were measured within a 2 meter belt along the 25m transect. In addition, the affected coral colony size and species was recorded. The team then repeated the 5 minute swim north counting all COTS. It was then discovered that the COTS aggregate had moved farther north so another 5 minute swim count was conducted. In both surveys the number of COTS at the survey site was found much lower than the previous week.

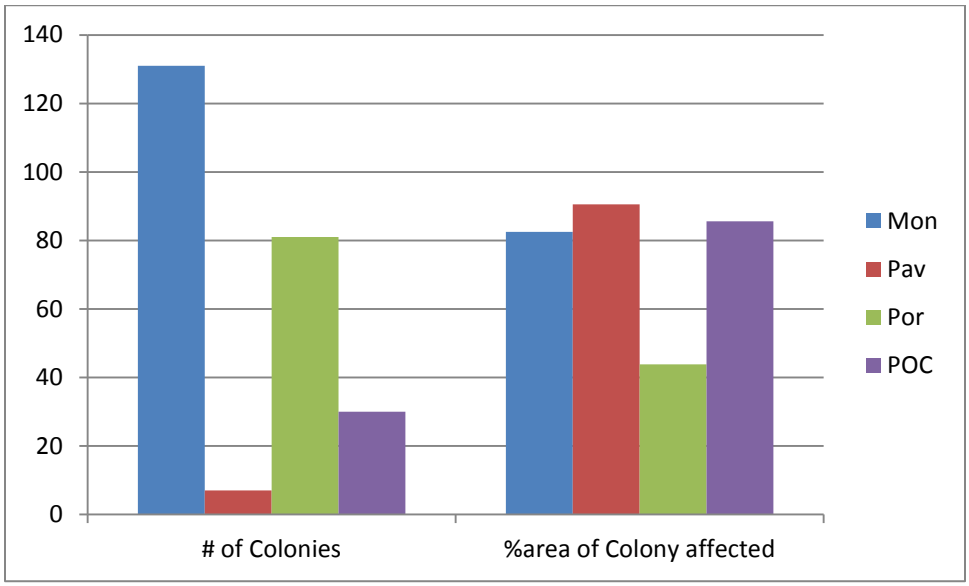
Results:

The number of COTS on the transects at the site dropped significantly from 59 to 16 in one week. The same was found on the 5 minute swim: 117 animals on 9/20/12 to 83 on 9/26/12. (Historically, only one COTS is counted on the transects.) However, upon a random swim, clusters of COTS were found in shallower areas farther north. In the northern most 5 minute swim another 66 COTS were counted. In a random swim to determine the northern reach of the outbreak, additional clusters of COTS were found but not counted.



In the COTS scar count, the most affected coral species was *Montipora*, with approximately 131 colonies affected (avg 82% of colony area dead), compared to 90% of area on 7 *Pavona* colonies, 85% of area on 30 *Pocillopora* colonies and 44% of area on 81 *Porites* colonies. (These are rough estimates as the scars were measure in one direction only).

Number of Coral Colonies with COTS scars and approx. area of colony dead



Conclusion:

The permanent transect lines where the counts were conducted are between 10 and 18m in depth. The predominant coral species at these depths are *Porites lobata.* Yet, the species with the most colonies affected were *Montipora* and *Pocillopora*, the species most preferred by COTS. The COTS were found to aggregate in clusters with animals even piled upon one another rather than spread out, so estimating the actual number of animals proved to be more complex. In both surveys, however, there were well over 200 animals counted, with many more seen in the random swims.

The northern border of the outbreak was not determined, but random swims did find other clusters in shallower areas north of the surveys. The COTS appeared to be moving north and into shallower depths, where more *Pocillopora* and *Montipora* colonies might be found. This COTS outbreak is clearly disturbing the coral community's diversity in the area by substantially decreasing the number of *Montipora* and *Pocillopora* colonies in the affected areas.

Further monitoring and mapping of the aggregate will be continued.

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