Synopsis of NOAA Support for Mystery Sheens off of San Diego during the week of 20AUG07

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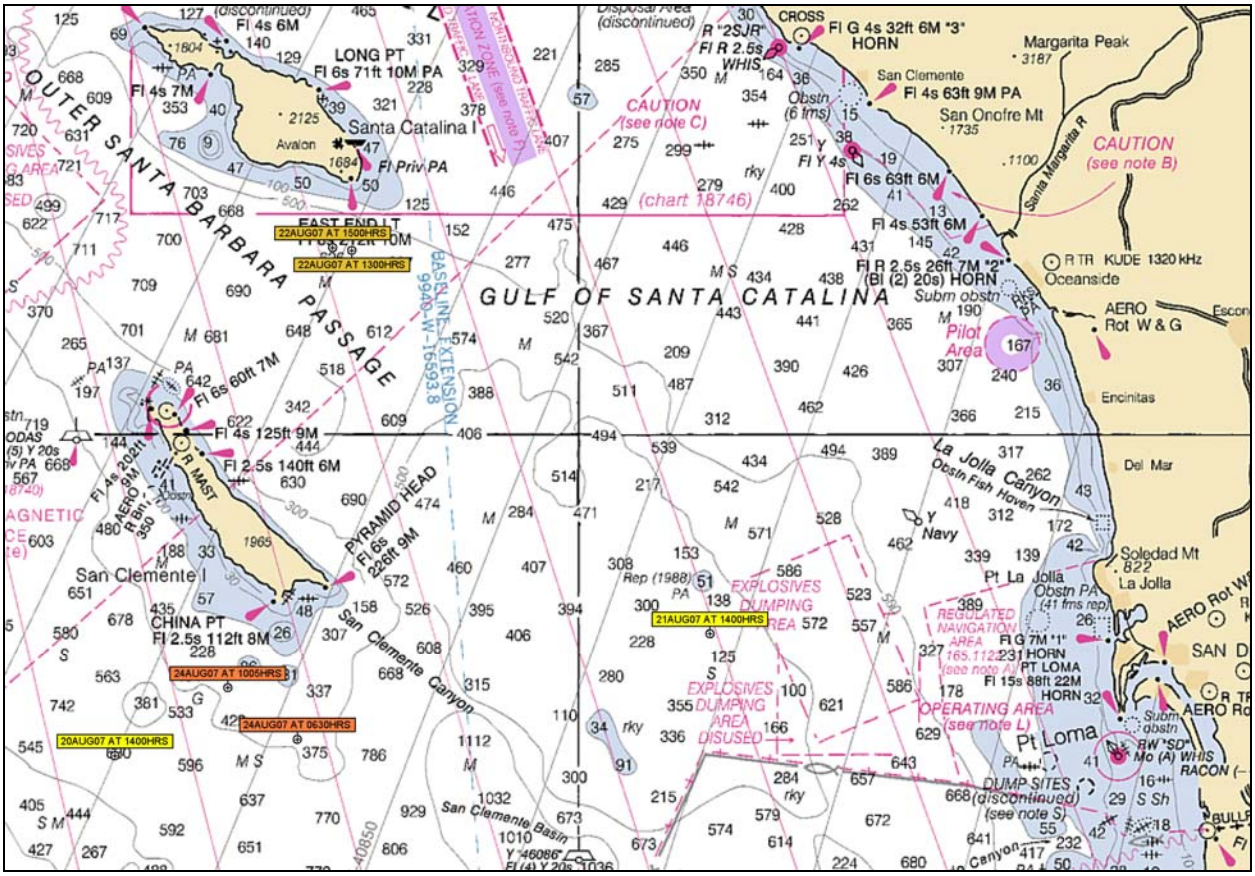
The following is a synopsis of trajectory support provided to Sector San Diego by NOAA's Emergency Response Division (ERD) for a series of mystery sheens reported during the week of 20AUG07. A summary of the reports provided to NOAA ERD is provided below and followed by a trajectory discussion for each incident.

Summary of Sheen Reports Received by NOAA ERD

The figure summarizes the reported sheen locations during the week of 20AUG07 as provided to NOAA ERD by Sector San Diego. Date & time of reports to Sector San Diego are given for each location. Color-coding is based on when the information was provided to NOAA ERD.



On 21AUG07, NOAA ERD received two sheen reports from Sector San Diego:

- 20AUG07 at 1400hrs – A 3nm x 3nm "thin" sheen approximately 15nm SW of San Clemente Island, centered at: 32° 37.30'N, 118° 38.80'W.

- 21AUG07 at 1400hrs – A 2nm x 6.6nm “dark” sheen with a “strong odor” 25-30nm off of the mainland, oriented roughly parallel to the coast and centered at: 32° 46.00’N, 117° 49.00’W.

On 22AUG07, NOAA ERD received two reports of the same sheen:

- 1300hrs – A 2nm x 2nm sheen approximately 5nm south of Santa Catalina Island, centered at: 33° 13.00’N, 118° 19.00’W.
- 1500hrs – A 4,500yd x 1,200yd (approximately 2nm x 0.5nm) continuous sheen, oriented with the major axis North/South and centered at: 33° 13.18’N, 118° 20.58’W.

On 24AUG07, NOAA ERD received two reports of the same sheen:

- 0630hrs – A 2nm x 3nm rainbow sheen approximately 10nm south of San Clemente Island, oriented with the major axis roughly North/South and centered at: 32° 38.50’N, 118° 23.50’W.
- 1005hrs – A 2nm x 4nm continuous rainbow sheen, oriented with the major axis at 070deg and centered at: 32° 42.13’N, 118° 29.36’W.

Trajectory Support Discussion

21AUG07 Reports:

On 21AUG07, NOAA ERD was notified of two sheen reports from 20 & 21AUG07 and asked to provide answers to the following three questions:

- Might the two sheens be related?
- Is there a potential for shoreline impacts?
- Are these sheens a threat to Mexican Waters?

Though there is a possibility that the sheens observed on 20&21AUG were related, given the distance from each other and local winds conditions in excess of 10 knots, it is very unlikely that they were separate observations of the same sheen. Any relationship between these two sheens would be difficult to substantiate without chemical sampling.

Given the distance offshore, the local wind conditions and that these were reported as sheen and not as slicks, these sheens were not expected to remain coherent long enough to reach the shoreline and cause shoreline impacts.

With local winds from the WNW-W and the summer currents to the south, there was a very small possibility these sheens could reach Mexican territorial waters; though, given the wind conditions, they were expected to be broken up and difficult to detect from overflights. However, if they persisted it was estimated that the 20AUG07 sheen could take 2-3 days to cross into Mexican territorial waters and that the 21AUG07 sheen could have taken 12 hours to cross into Mexican territorial waters.

No samples of either sheen were obtained, so no hindcast trajectory estimates were provided.

22AUG07 Reports:

A trajectory forecast estimate was provided by NOAA ERD for the two sheen reports from 22AUG07. Because local wind conditions were relatively light, the sheen was expected to persist for up to several days. Furthermore, the winds were from a southerly direction and were

expected to cancel out the effects of the southbound local currents, thus the sheen was not expected to move very far as it persisted. A primary search area was provided for the following morning's first light overflight and given the sheen's possible proximity to shore, further monitoring was recommended.

At 1140 the next day, the USCGC Narwhal obtained samples from a 100yd^2 patchy sheen located nearshore. In support of further pollution investigations for this case and to assist in the identification of possible source vessels, NOAA ERD provided the following hindcast trajectory estimates based on the sheen location from 1510hrs on 22AUG07:

- 24 hours earlier (August 21 1500 hrs), the sheen could have been about 3.5 nm offshore of the area between Ben Weston Point and Salte Verde Point, centered at approximately 33 deg 17.20'N, 118 deg 31.13'W, with a search radius of about 6 nm.
- 48 hours earlier (August 20 1500 hrs), the sheen could have been about 8.5 nm offshore of Ribbon Rock, centered at 33 deg 21.18'N, 118 deg 42.01'W, with a search radius of about 9 nm.

24AUG07 Reports:

The reports provided on 24AUG07 indicated sheen movement to the NW, 7-10nm offshore of San Clemente Island. The second sheen report was provided by USCGC Sea Otter when they had obtained pollution samples. In support of further pollution investigations for this case and to assist in the identification of possible source vessels, NOAA ERD provided the following hindcast trajectory estimates based on the sheen location from 1005hrs on 24AUG07:

- 24 hours earlier (August 23 0800 hrs), the sheen could have been in an area centered about 14 nm SSE of San Clement Island at 32 deg 36.6' N, 118 deg 21.08' W. Highest probability search area is 4 nm x 12 nm oriented with the major axis NW to SE; the lower probability search area is 5 nm x 21 nm with the same orientation and center point.
- 48 hours earlier (August 22 0800 hrs), the sheen could have been in an area centered about 20 nm SSE of San Clement Island at 32 deg 33.11' N, 118 deg 16.58' W. Highest probability search area is 5.5 nm x 14 nm oriented with the major axis NW to SE; the lower probability search area is 15 nm x 30 nm with the same orientation and center point.

It should be noted that the quality of information provided from field reports can have important implications for pollution investigations and trajectory estimates. In these cases, the quality of information provided to NOAA ERD improved throughout the week and they provide a good basis for future trajectory requests. When requesting trajectory support for slicks & sheens, the following information would be helpful:

- Location (usually of center) given as accurately as possible in both latitude/longitude and description relative to land
- Slick/sheen dimensions
- Shape and orientation of slick/sheen
- Other descriptors of overall character as well as differences observed across sheen
    - Color (e.g. silver sheen, rainbow sheen, brown, black, etc.)
    - Distribution (e.g. continuous, patchy, windrows, tarballs, etc.)
- Observation platform (i.e. vessel or aircraft)