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North Coast Areas of Special Biological Significance Regional Monitoring Program: First Year Results

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EXECUTIVE SUMMARY

In northern California, over 123 km of shoreline have been designated as marine water quality protected areas, termed Areas of Special Biological Significance (ASBS). While the standard for water quality protection in an ASBS is "natural water quality", there are at least 106 documented coastal discharges in the north coast region that potentially threaten this important ecological resource. The goal of this study was to assess the water quality status of ASBS by answering two questions posed by ASBS regulation: 1) What is the range of natural water quality near reference drainage locations? and 2) How does water quality near ASBS discharges compare to the natural water quality near reference drainage locations? The sample design focused exclusively on receiving water (not effluents) and wet weather, which are the locations and times where natural and anthropogenic contributions can mix, making pollutants difficult to identify and control. Thirteen locations encompassing 28 site-events were sampled immediately prior to (<48 hours), then during or immediately following (<2 hours) storm events ranging from 0.31 to 4.53 inches rainfall.

The following results and conclusions were gleaned from this study:

- In its first year, the North Coast Regional Monitoring Program was able to demonstrate modest success and collect valuable information.

While all targeted site-events from reference receiving water locations were collected, only 50% of the discharge receiving water site-events were collected. Drought conditions were a possible reason for the delay in achieving success for discharge receiving water sites. However, there was an element of slow reactions resulting in lack of necessary funding and support to complete all of the required sampling.

- The North Coast Regional Monitoring Program was successful at translating the narrative standard "natural water quality" into numerical guidelines.

Defining natural water quality was accomplished through the use of reference receiving water sites with minimal to no impact from human activities. We are confident that these sites were minimally impacted because none demonstrated toxicity to marine organisms, no site had quantifiable concentrations of man-made constituents (i.e., organophosphorus and pyrethroid pesticides), and outlier concentrations of naturally-occurring parameters (i.e., TSS, nutrients, trace metals) was extremely rare.

- Regionally, constituent concentrations from north coast discharge and reference receiving waters were comparable.

The distributions of concentrations at reference and discharge receiving water sites overlapped one another and median concentrations differed by less than a factor of three between them. Total suspended solids (TSS) was the lone exception. Not only was the TSS concentrations significantly greater at discharge than reference receiving water sites, but there was a substantial increase in TSS concentrations in discharge receiving waters post-storm compared to pre-storm. A similar increase was not observed at reference sites.

- The Saunders and Redwood ASBS had amongst the lowest exceedance rates of natural water quality guidelines at discharge receiving water sites statewide. In contrast, the Trinidad ASBS had the highest exceedance rate of any ASBS in California.

Cumulative across all parameters, Redwood and Saunders Reef ASBS had an exceedance rate of 12% and 9% respectively, which is less than what we would expect from the reference sites. Trinidad ASBS had a 40% exceedance rate of natural water quality guidelines. Based on limited data, the exceedance rate at Trinidad ASBS has been declining over time. The decline may be the result of new structural best management practices (BMPs) installed part way through the monitoring period. Alternatively, the decrease may be an artifact of sampling, which was conducted slightly differently in early years relative to later years. Only future monitoring will be able answer this question.

- Total suspended solids appears to be the most problematic constituent at north coast ASBS and at Trinidad ASBS in particular.

TSS exceeded natural water quality guidelines in over 70% of the north coast samples, and the majority of these occurred at the Trinidad ASBS discharge receiving water site. The next most problematic constituents were PAHs and trace metals, both of which are known to adsorb to solids and were positively correlated with TSS concentrations. Ultimately, if TSS concentrations can be reduced, managers will likely see commensurate reductions in PAHs and metals, too.

- The next year of data will be particularly important for the North Coast Regional Monitoring Program.

The final year of monitoring will provide data for the currently unsampled Kings Range ASBS, provide an extra year of data to help confirm the improving trend in water quality at the Trinidad ASBS, and corroborate the good water quality status at Redwood and Saunders Reef ASBS. Finally, the extra year of monitoring will demonstrate to the regional collaborative, including both regulated and regulatory parties, that coordinated monitoring does provide additional value and unique perspectives at a reduced cost compared to individualized monitoring efforts.

Full text: 856_NorCalWQRepWCovAndApp.pdf