NATIONAL MARINE SANCTUARIES ™

BEACH CLOSURES AND MICROBIAL CONTAMINATION

Action Plan Summary

MONTEREY BAY NATIONAL MARINE SANCTUARY

THE ISSUE:

Each year, beaches adjacent to the Monterey Bay National Marine Sanctuary (MBNMS) suffer from hundreds of beach closures and water quality advisories. Most beach closings and advisories are based on water quality monitoring that detects elevated levels of bacteria. Bacteria indicate the presence of disease-causing organisms from human and animal wastes. These wastes typically enter coastal waters from land-based water runoff draining from coastal watersheds, carrying with it pet or wildlife wastes, discharges of untreated wastes from sanitary sewer lines or septic system failures, and storm water runoff from urban, sub-urban, and rural areas. Polluted waters affect human and marine health as well as our local economy that is in part dependent upon tourists who come to enjoy our beaches.

OUR GOAL

The sanctuary's goal is to work closely with local partners, to eliminate all beach closures in the sanctuary by 2010. Additionally, the MBNMS seeks a significant decreasing trend in beach water quality warnings, and implementation of real-time monitoring and posting procedures where the public is notified of beach closures, advisories or warnings in a timely manner.

BACKGROUND INFORMATION

Beach closures and advisories are actions taken by local health department officials to inform the public about potentially unsafe water quality for recreation. Water quality is most commonly evaluated by local environmental health agencies through regular water quality testing, especially at frequently visited beaches. Health department officials are also informed by local agencies when **sewage** spills occur, and issue beach closures and warnings as soon as possible after such events.

Beach water quality is evaluated by counting the number of bacteria in the water, indicating the presence of human or animal wastes that may contain harmful disease-causing organisms.

Sources of bacteria include domestic pet or wildlife wastes, discharges of untreated wastes from sanitary sewer lines, septic system failures, and homeless encampments, among many others. The most common route for bacteria to enter the ocean is in storm water runoff from urban, suburban, and rural areas, but may also include water entering storm drains during dry seasons or sewer spills. Since storm drains carry water directly to the ocean, any contaminated water entering a storm drain eventually makes its way to sea. Sewage spills have a variety of causes including pipe blockages, failing equipment, deteriorating pipes, and power failures, among others.

MBNMS

The bacteria that environmental health officials test for do not cause disease in humans or animals, rather, they indicate the presence of other disease-causing agents, such as viruses. Hence, these bacteria are called indicator bacteria, and suggest water contact should be avoided. The indicator bacteria most commonly counted are called **"Coliforms."** Coliform bacteria originate from soils, plants, and human and animal waste. Their presence in high numbers, regardless of their specific origin, in a water body is a good indicator the water is not safe for human contact.

Fecal coliform, a specific kind of total coliform bacteria, is found primarily in the intestinal tracts of mammals and birds, and is an indicator of wastes. Used together, non-fecal coliform and fecal coliform bacteria levels are an important tool helping scientists to determine whether it is safe to surf and swim at the beach.

Enterococcus is another bacterium used as an indicator. It is found in the human intestine and is a good indicator of human waste. According to studies conducted by the Environmental Protection Agency, enterococci have a greater correlation with gastrointestinal illness associated with swimming in both marine and fresh waters than other bacterial indicator organisms, and they are less likely to "die off" in saltwater.

Human health impacts associated with elevated bacteria levels include fever, flu-like symptoms, ear infection, respiratory illness, **gastroenteritis**, **cryptosporidiosis**, and **hepatitis**. Impacts are not limited to humans, and data suggest a **protozoan** found in freshwater runoff may contribute to an increase in deaths among sea otters. Beach closures do not only affect human or marine health, but they can also result in significant economic losses for our communities.

Even though California has instituted the most comprehensive water quality monitoring program in the nation, the program is compromised because water quality test results can be a slow process. Water quality tests for bacteria take 18 to 36 hours to complete. By the time the beach is posted with warning or closure signs, the indicator bacteria may no longer be present in the near shore waters. Thus a beach may be open when it is contaminated, and posted when it is clean. Also, this lag time makes it difficult to track sources of **microbial** contamination as the source has often become dispersed over a wide area by the time investigators arrive on scene. Furthermore, lack of financial resources precludes environmental health departments from monitoring entire stretches of popular beaches. Recently published data indicate bacteria levels in beach water change more frequently than water samples are taken.

Health officials can take three separate actions when faced with sewage spills, high levels of indicator bacteria, or storm events: Rain Advisory, Beach Warning and Beach Closure.

- A ***"Rain Advisory"*** can be issued at a beach where past experiences have demonstrated rain water runoff often carries pollution along to the beach. After a rain storm, bacterial counts usually exceed state standards for recreational water use.
- A ***"Beach Warning"*** indicates at least one bacterial standard has been exceeded, however there is no known source of human sewage. Beach Warning signs may be short-term postings where a single bacterial standard is exceeded, or long-term where repeated contamination occurs.
- A ***"Beach Closure"*** indicates a known sewage spill or a repeated exceedance of bacterial standards from an unknown source. This posting is a notice to the public that the water is unsafe for human contact and there is high risk of illness from contact.

Education is the key to changing our world for the better. Do your best to not only educate yourself but also your family, friends and neighbors. Make an effort to get involved in community activities focused on water quality such as monitoring events, coastal cleanup day, storm drain stenciling, or neighborhood clean-ups. Events are often only one day and take a minimal commitment. Contact either the sanctuary or local groups to learn about events in your area.

SOME SIMPLE THINGS YOU CAN DO TO REDUCE BEACH CLOSURES

- Oils and grease should not be disposed of down the storm drain or the drains in your house. Obstructions in sewage lines, often caused by cooking oil and grease, are the top cause of sewage spills in our region.
- Large objects (diapers, tampons, etc.) should not be disposed of in sanitary sewers.
- Dispose of pet wastes in a toilet or a trash can.
- Support funding initiatives and financing options for stormwater programs, sewer system upgrades, and system maintenance.
- Maintain your home's sanitary sewer **lateral** or septic system. Understand how your system functions and what may cause it to malfunction.
- Educate yourself, friends, family, and neighbors on the subject of beach closures and bacterial contamination.
- Contact your local public works department to find out what your local city or county is doing about bacterial contamination.
- If you see a sewage spill occurring in a street or a storm outfall into the ocean notify your local Public Works Department.

If you are interested in volunteering to test water quality, the MBNMS Citizen Watershed Monitoring Network and Coastal Watershed Council organize three separate water quality events throughout the year.

- ***Snapshot Day each year in May:*** volunteers collect samples and do basic water quality assessment on waters from the 11 major watersheds draining into the MBNMS.
- ***Urban Watch:*** a summer-long (April through September) water quality monitoring program where volunteers collect and test water once a month during dry weather months.
- ***First Flush:*** volunteers collect and test rain water during the first major rain storm of the winter season. Timing is weather dependant but usually occurs in November or December.

THE SANCTUARY'S ACTION PLAN

The sanctuary's "Beach Closures and Microbial Contamination Action Plan" was developed jointly with a variety of stakeholders and partners and includes, but is not limited to, the following components:

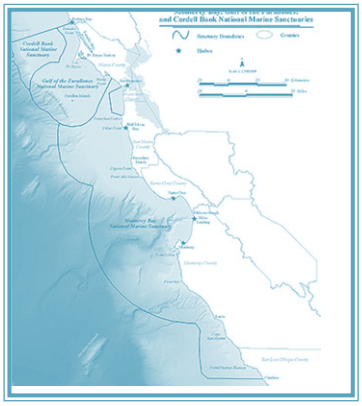
- Working with scientists and public health agencies to implement cutting-edge water quality tests to increase our knowledge about water quality, protect marine ecosystem health, and accurately notify the public about water quality conditions
- Partnering with local jurisdictions to better map water quality data with management practice implementation in order to better allocate resources and identify hot spots of concern
- Assisting and collaborating with local jurisdictions to implement infrastructure projects and source control programs to reduce bacterial contamination
- Engaging the business community about their role in protecting water quality, and providing up-to-date information on best management practices for selected industries and municipal operations
- Enlisting public participation by educating citizens about their role in protecting water quality, including playing a part in source reduction and supporting programs and fees to address this issue
- Coordinating with the Regional Water Quality Control Boards to ensure consistent and comprehensive enforcement of sewage spills
- Developing protocols to ensure when sewage spills occur, they are contained and cleaned up according to proper standards

For a complete listing of the sanctuary's "Beach Closures and Microbial Contamination Action Plan" please visit http://sanctuaries.nos.noaa.gov/jointplan/m_reptoad.html and scroll down the page.

The Joint Management Plan Review (JMPR)

"Beach Closures and Microbial Contamination" is one of the action plans in the MBNMS Draft Management Plan. The MBNMS Draft Management Plan includes twenty-eight plans that, once finalized, will guide sanctuary management for the next five years. The plan is a revision of the original management plan, adopted with sanctuary designation in 1992, and is focused on how to best understand and protect the sanctuary's resources.

The National Marine Sanctuary Program (NMSP) is updating the management plans for the Cordell Bank, Gulf of the Farallones, and Monterey Bay National Marine Sanctuaries a process known as the Joint Management Plan Review (JMPR).



GLOSSARY

Coliform: A bacteria originating from the colon.

Cryptosporidiosis: A diarrheal disease caused by microscopic parasites of the genus Cryptosporidium. Once an animal or person is infected, the parasite lives in the intestine and passes in the stool. Now recognized as one of the most common causes of waterborne disease within humans in the United States.

Enterococcus: A streptococcus bacteria normally present in the intestine.

Fecal: Of or related to bodily waste (feces) discharged from the anus.

Gastroenteritis: Inflammation of the lining membrane of the stomach and intestine.

Hepatitis: A disease marked by inflammation of the liver.

Lateral: The connection between a house and the main sanitary sewer line.

Microbe: An organism of microscopic size or smaller.

Protozoa: Single cell microscopic organism.

Sewage: Liquid or solid waste matter carried by sewers.

Streptococcus: A nonmotile, chiefly parasitic bacteria causing disease in humans.

How You Can Get Involved in the MBNMS Management Plan Process

The MBNMS welcomes your ideas about important resource management issues in the sanctuary. A Draft Management Plan and Draft Environmental Impact Statement are scheduled for release to the public in 2006. Following their release, hearings will be held in several locations throughout the region to gather public comment. Written comments will be accepted as well. To find out about public hearings, or how to submit written comments, please visit our website at http://www.sanctuaries.nos.noaa.gov/jointplan.

Resources

California State Water Resources Control Board http://www.swrcb.ca.gov
Heal The Bay http://www.healthebay.org
Monterey Bay National Marine Sanctuary http://montereybay.noaa.gov
Monterey Bay National Marine Sanctuary Citizen Watershed Monitoring Network
http://montereybay.noaa.gov/monitoringnetwork/welcome.html
Monterey Bay National Marine Sanctuary Water Quality Program
http://montereybay.noaa.gov/resourcepro/water-pro.html
Natural Resources Defense Council http://www.nrdc.org
Sanctuary Integrated Monitoring Network (SIMoN)
http://www.mbnms-simon.org/sections/beaches/overview.php?sec=b
US Environmental Protection Agency http://www.epa.gov

Additional information, activities and ways to get involved:

Coastal Cleanup Day http://www.coastal.ca.gov/publiced/pendx.html
Coastal Watershed Council
http://www.coastal-watershed.org
Monterey Bay National Marine Sanctuary Citizen Watershed Monitoring Network Volunteer Information http://www.mbnms.nos.noaa.gov/monitoringnetwork/welcome.html
Ocean Conservancy
http://www.oceanconservancy.org
Santa Cruz Surfrider Chapter
http://www.surfridersantacruz.org
Save Our Shores
http://www.saveourshores.org
Surfrider International
http://www.surfrider.org

THE MONTEREY BAY NATIONAL MARINE SANCTUARY

Stretching from Marin to Cambria, the Monterey Bay National Marine Sanctuary encompasses 276 miles of shoreline and 5,322 square miles (4,625 nautical miles) of ocean, extending an average distance of 30 miles from shore. At its deepest point, the sanctuary reaches down 10,663 feet (more than two miles). The sanctuary was established for the purposes of resource protection, research, education, and public use. Its natural resources include one of our nation's largest kelp forests and one of North America's largest underwater canyons. It is home to one of the most diverse marine ecosystems in the world, including 33 marine mammal species, 94 seabird species, 345 fish species, and numerous invertebrates and plants. This remarkably productive marine environment is fringed by spectacular coastal scenery, including sandy beaches, rocky cliffs, rolling hills, and steep mountains.

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