City of Newport Beach
Water Quality/Coastal Tidelands Committee Minutes

Date: September 12, 2013
Time: 3:00 p.m.
Location: Newport Coast Conference Room, 2nd Floor, Bay E

1. **Welcome/Self Introductions**
   Committee Members present:
   Chairwoman/Council Member Nancy Gardner
   Louis Denger
   Carl Cassidy
   Tom Houston
   Fred Galluccio
   George Robertson

   Guests present:
   Jack Skinner, SPON
   Jim Mosher, resident
   Monica Mazur, resident
   Ray Heimstra, Orange County Coast Keepers
   Darrel Ferguson, Surfrider Foundation

   Staff present:
   John Kappeler, Water Quality Manager
   Shari Rooks, Public Works Specialist

   Announcement: Chair Nancy Gardner announced that in November the Coastal Commission will hold their meeting here in the Council Chambers. The **Poseidon Project** will be on their agenda.

   The agenda for the Water Quality/Coastal Tidelands Committee was posted at 8:54 am on September 9, 2013, in the binder located in the entrance of the Council Chambers at 100 Civic Center Drive.

2. **Approval of Previous Meeting's Minutes**
   The minutes for July 11, 2013, meeting were approved.

3. **Old Business**
   a. **Bay and Ocean Bacteriological Test Results**
   Monica Mazur reviewed recent water quality test results within Newport Bay and along the ocean shoreline.
   - It was suggested that in the future the test results should be posted separately on the calendar as a .pdf for easier viewing.
   - Dramatic improvement at the Arches Bridge after July 8, 2013, may be attributed to the fact that Costa Mesa recently began once weekly street sweeping again in areas upstream that had been discontinued for the past two years and they also placed catch basin screens in their entire watershed.
   - **John Kappeler** reported to the Committee about a Costa Mesa Sanitation District's pump station failure over Labor Day weekend that spilled 79,000 gallons of sewage. Both Newport and Costa Mesa responded and approximately 9,000 gallons were

captured and the rest made its way to the Delhi Channel. The Dunes was closed for several days over the holiday weekend.

b. **Committee Goals and Priority Update**
John Kappeler advised he has been doing some research with HOAs in south county and the City Attorney's Office and he will come back to the Committee with an update on street sweeping enforcement at the October meeting.

ACTION: **Chair Gardner** requested we find out if the City of Costa Mesa intends to continue sweeping the areas. It was suggested that the Committee contact the Mayor and ask him to send Costa Mesa a letter thanking them and letting them know we have noticed a significant improvement in water quality and believe it may be directly related to their street sweeping. **Tom Houston** suggested that a carbon copy of the Mayor's letter be sent to any agency that may have contributed grant funds to Costa Mesa for water quality programs.

ACTION: **John Kappeler** to follow up with **Amy Senk** regarding **Heal the Bay's** "C" rating recently for **Buck Gully**.

4. **New Business**

a. **Jack Skinner** gave the Committee an update on the City's biofilm work as it relates to **Bay Water Quality and Biofilm.** (See attached PowerPoint Presentation.)
- A copy of the July-August 2010 Study entitled, "Regrowth of Enterococci & Fecal Coliform in Biofilm" was distributed at the meeting for reference.
- Biofilm is a habitat that has helped bacteria survive for 3 billion years. It provides a safe environment for enhanced bacterial replication and provides nutrients and water for bacteria.
- Study findings confirmed that frequent street sweeping (vacuum suction type), the cleaning of catch basins, reducing runoff from landscape watering, smart landscape design, and filling in gutter pooling areas all contribute to the reduction of biofilm.
- The LA Regional Board and the San Diego Regional Board each have a Natural Source Exclusion. Our Regional Board has stated that if all BMPs possible have been put in place to reduce enterococci levels and the number cannot be reduced from 30 million to 104, then the City has the option to approach them to request a natural source exclusion to raise the number. The Board is supposed to come to the next WQ/CT Committee meeting to give a presentation on the Natural Source Exclusion and what they think about it.
- The enterococci marker numbers were relevant in the 50's when we were discharging into the surf zone or just outside the surf zone but are no longer relevant. The original numbers were established based on studies done at Coney Island in the 50's.

b. **Ray Heimstra** gave the Committee an update on the review of the final report for the **Newport Bay Copper Project**. (See attached PowerPoint Presentation.)
- Balboa Yacht Basin focused incentive program was a voluntary 4-year project that attempted to get boaters to switch to non-biocide bottom paints.

- There were three basic components of the program: An education program, a financial incentive for Balboa Yacht Basin boaters and a water monitoring program to document progress in reducing copper levels.
- The goal was to convert 50% of the boats (80) but only ten boats were converted. The financial incentive turned out to be approximately $4000 per boat (covered the difference in the cost between a traditional biocide paint job and a non-biocide paint job.) Note: Five of the boats that were originally painted with Bottomspeed paint were ultimately repainted with copper paint because the paint manufacturer applied a bad batch of sealer and paint.
- It was not difficult to get the boat owners interested in the program, but it was difficult to get the boat yards interested in the program.
- Program reduced the amount of copper in the bay by 72.78 lbs. The measurement was done using a formula that took into account the standard leach rate and the area of the boat. However, in the Balboa Yacht Basin area there was no noticeable difference because only 10 out of 160 boats participated.
- The EPA's estimate of the amount of copper entering the bay is currently 50,000 pounds per year (based on an estimated number of 10,000 boats in the harbor.) Coastal streams input is about 7,000 pounds per year and the input from all of our storm drains is about 700 pounds per year.
- There is a copper TMDL in development and expected to be released any day. The California Toxic Rule states that California cannot have a level exceeding 3.1 micrograms per liter in salt water.
- **John Kappeler** stated that SCCWRP did a toxicity test in Newport Bay approximately two years ago and they did not find any toxicity at the 3.1 (chronic) or 5.4 (acute) levels 60 - 80 percent of the time and asked **Ray Heimstra** if the Regional Board is looking at that study and taking it into account when they design the TMDL. Ray suggested we consider doing site specific objective to develop something very specific for Newport Bay.
- **Tom Houston** asked if it would be worthwhile to spend the money to establish a site specific objective and Ray said that he has been told that Newport Bay is currently at a 5 and the site specific objective might get us to a 3.2 or a 3.4.
- AB 425 recently passed the state legislature and has gone to the Governor for his signature. The bill states that the Department of Pesticide Regulation will determine a new leach rate for copper-based antifouling paint used on recreational vessels and make recommendations for appropriate mitigation measures to protect the aquatic environment.
- Ray told the Committee that the last budget he saw for the County had $100,000 set aside to work on TMDLs.

5. Public Comments on Non-Agenda Items

- **Fred Galluccio** asked if the Committee would want to put an item on the agenda to discuss whether the City should be fracking free. **Chair Gardner** suggested the subject could be brought up at the subcommittee she sits on that is currently reviewing bids from firms to manage the City's oil fields to see first if fracking would be something that those firms would ever consider using.
- Fracking will be added to the October agenda so that a motion regarding fracking in the City could be made.

6. **Topics for Future Agendas**
   (a) Bacteriological Dry-Weather Runoff Gutter Study (Phase III)
   (b) Prop 84 ASBS Grant Program
   (c) Big Canyon Project
   (d) Rhine Channel Project Wrap Up
   (e) Senate Bill – SB 1447
   (f) Marine Protected Areas (MPAs)
   (g) Eelgrass Program
   (h) Trash Project for Storm Drains
   (i) Harbor Commission Copper Report
   (j) Orange County coastal Regional Sediment Management Plan
   (k) Fracking Free City
   (l) Adopting a Natural Source Exclusion

Set Next Meeting Date
The next meeting date was set for October 10, 2013, at 3 PM in the **Newport Coast Conference Room, Bay E, 2nd Floor.**

7. **Adjournment**
   The meeting was adjourned at 4:45 pm.

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Chairwoman / Nancy Gardner

Regrowth of Enterococci & Fecal Coliform in Biofilm

Clean Beaches Conference
John F. Skinner, M.D.
Joseph Guzman, OCHCA
John Kappeler, City of Newport Beach

November 10, 2010

The Study

In order to protect Newport Harbor from human fecal pollution - the City of Newport Beach has implemented a number of measures, including a comprehensive fiber-optic scoping system to ensure the integrity of the City's sewer system.

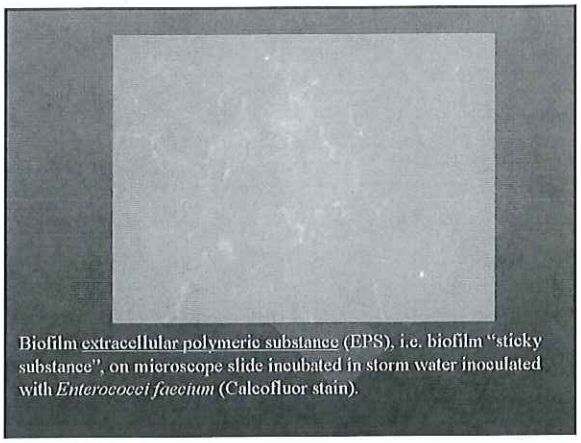
Background

In 2004 the City of Newport Beach identified five major stormdrains flowing from residential areas into Newport Harbor that had elevated fecal indicator levels of unknown cause. The enterococci and fecal coliform were reported at levels from 5,000-10,000 per 100/ml.

Background

A 2006 study by OCHCA water quality lab personnel found high levels of enterococci and fecal coliform bacteria growing in biofilm in the Dover drain.

Results: 4.6Million enterococci and 1.8Million fecal coliform per 100/ml or 100g of biofilm.



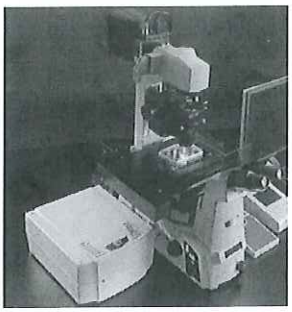
Biofilm extracellular polymeric substance (EPS), i.e. biofilm "sticky substance", on microscope slide incubated in storm water inoculated with *Enterococci faecium* (Calcofluor stain).

Increasing numbers of attached bacterial cells on microscope slides were also visualized using PNA FISH: peptide nucleic acid probes and fluorescence in situ hybridization. Live cells fluoresce (green or red).

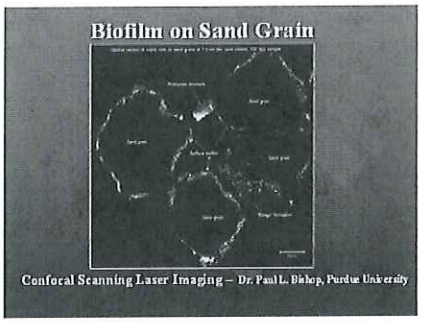
Escherichia coli

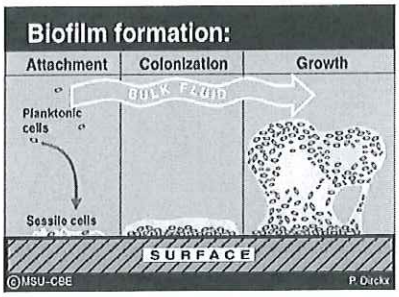
Enterococci faecium

In the **Sonicator**

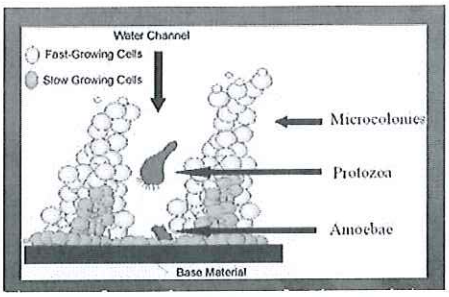


In the **Confocal Laser Scanning Microscopy**



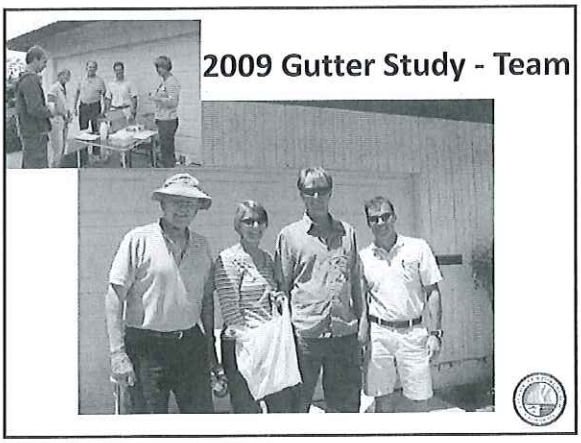


Biofilm provides a safe environment for enhanced bacterial replication, provides nutrients and water for the bacteria, protects against microbial predators, UV light, drying and disinfectants. Bacteria detach from the biofilm surface as planktonic cells. The rate of detachment is related to water flow velocity, shear forces, nutrient level and aging of biofilm.



- Biofilm is a habitat created by bacteria for survival
- 99% of bacteria are found in biofilm
- Biofilm helped bacteria survive for 3 billion years
- Bacteria communicate by quorum sensing in biofilm
- Bacteria can go dormant for years and become non-culturable, especially in cold water

William Costerton, et al



Study Area

- 300' of Street Gutter
- 4 Sampling Locations (Hose, 6m, 45m and 100m)
- Sampled (3) Pulses of Water
- Repeat Study After Street Sweeping

Study Phase I - Results

Hose: 9 CFU/100ml

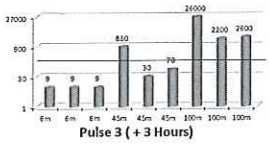
9m 9 CFU/100ml

45m 880 CFU/100ml

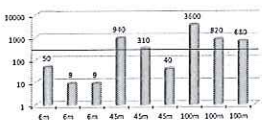
100m 26,000 CFU/100ml

Water Quality Results

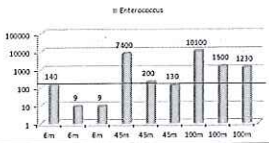
Pulse 1



Pulse 2 (+ 15 Minutes)



Pulse 3 (+ 3 Hours)



Enterococcus:
State Standard: 104 CFU/100ml
Hose: 9 CFU/100ml

Study Area (Phase 2)

1250 CFU/100ml

1250 CFU/100ml

160 CFU/100ml

Study Area (Phase 2)

220 CFU/100ml

70 CFU/100ml

89* CFU/100ml

City of Newport Beach - Municipal Ordinance

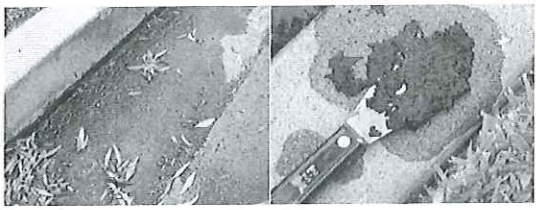
Buster

During the study no dog fecal matter found.

Major source of gutter water – sprinkler runoff

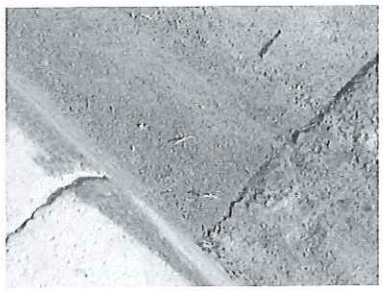
Study Area (Phase 3)

Street Sweeper (vacuum suction type) – reduction from 26,000 CFU/100ml to 1,550 CFU/100ml



Mature Biofilm

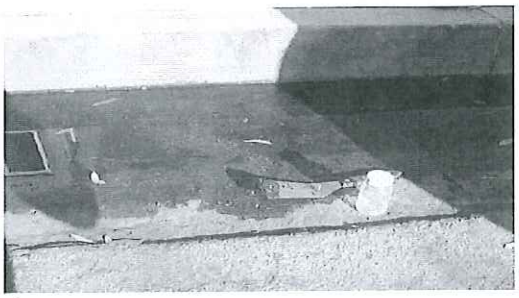
Sample Results
- 9,000,000 CFU/100ml enterococci
- 1,140,000 CFU/100ml enterococci



Desiccated Biofilm

14 days after scraping
(patches of dark biofilm reforming)

4 days after scraping – 120,000 CFU/100ml enterococci (small patches)
5 days after scraping – 2,060,000 CFU/100ml enterococci (small patches)
31 days after scraping – 670,000 CFU/100ml enterococci (cold weather)



Biofilm Removal Technique from Standing Gutter Water

June 7, 2010, G Street, Balboa Peninsula Ent: 2.5 million/100ml
June 14, 2010, Sapphire Avenue, Balboa Island Ent: 5.4 million/100ml
June 16, 2010, 32nd Street, Newport Beach Ent: 5.2 million/100ml

Conclusions – Public Health Impacts

- Swimmer related GI illnesses from sewage is not believed to be due to fecal coliform or enterococci
- Noroviruses in sewage are believed to be the major cause because of the very high endemic rate, no immunity after infection, virus mutation and the virus only multiplies in the cells that line the human intestinal tract
- Noroviruses and other enteric viruses don't multiply in biofilm

Conclusions – BMPs

- Frequent street sweeping
- Cleaning out catch basins
- Reduce runoff from landscape watering
- Smart landscaping design
- Proper placement of sprinklers
- Filling in gutter pooling areas

Conclusion

If verified by others, these findings provide a logical explanation for elevation of fecal coliform and enterococci found in urban runoff in the absence of human fecal contamination

Regrowth of Enterococci & Fecal Coliform in Biofilm

Studies of street gutters and storm drains in Newport Beach, CA, suggest causes for high bacteria levels.

Wednesday, June 30, 2010

By John F Skinner, John Kappeler, Joseph Guzman

Comments

Recently the city of Newport Beach, CA, and the Orange County (CA) Health Care Agency Water Quality Laboratory have completed studies presenting evidence that biofilm regrowth of enterococci and fecal coliform bacteria is occurring in street gutters and storm drains. This may explain the occasional high levels of these bacteria in runoff water flowing from residential areas into nearby Newport Bay. If these findings of regrowth are duplicated by others, the health threat to recreational swimmers resulting from nonpoint sources may be overestimated (Colford et al. 2007).

The city of Newport Beach has implemented a number of measures to be certain that raw sewage is not entering the city's urban runoff system, including a comprehensive fiber-optic scoping program to check for sewage/storm drain cross-connects, and to identify any breaks in the integrity of the city's sewer system.

Previous studies indicate that biofilms provide a safe environment for enhanced bacterial replication; supply nutrients and water for biofilm bacteria; and offer protection against microbial predators, ultraviolet (UV) light, drying, and disinfectants (Coghlan 1996, Costerton et al. 1995, Donlan and Costerton 2002, Donlan 2002).

Bacteria have been observed detaching from the surface of biofilms and entering the overlying water column as single planktonic bacteria or small clumps of bacteria attached to fragments of biofilm (Figure 1). The rate of detachment of these bacteria is related to factors such as water flow velocity, shear forces

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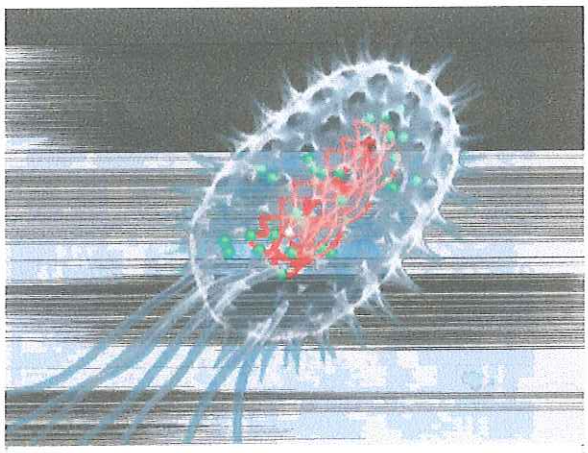

Photo: istockphoto.com/sgame

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- The Right BMPs? Another Look at Water Quality
- Detecting Bacteria in Coastal Waters: Part Two
- It Takes Skill to Make Music

nutrient availability, and aging of biofilm.

In 2006, the Orange County Health Care Agency's Water Quality Laboratory staff performed studies that determined that enterococci and fecal coliform were multiplying in bacterial biofilms in the Dover Drive storm drain located in Newport Beach (Ferguson 2006).

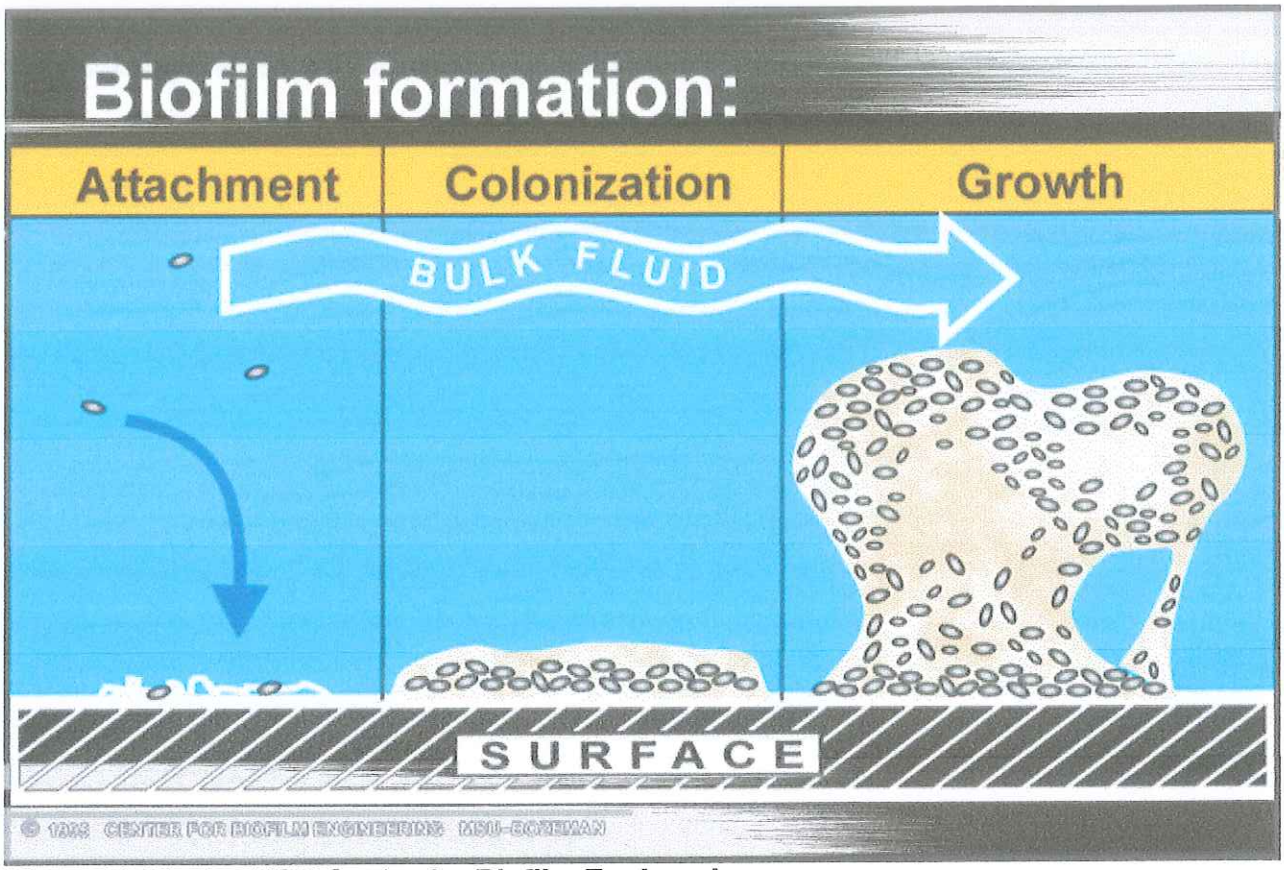

Photo: P. Dirckx. MSU Center for Biofilm Engineering
Figure 1. Process of biofilm formation

In the 2006 study, biofilm in the Dover Drive storm drain contained up to 4.6 million enterococci and 1.8 million fecal coliform/100 grams or 100 milliliters of biofilm. Enterococci and *E. coli* were grown in the laboratory under simulated natural conditions using filtered stormwater. These bacteria grew on the glass slides as microcolonies and secreted extracellular polymeric substances (EPS), a marker of biofilm formation. The presence of this EPS was validated using Calcofluor stain (Polysciences Inc., Warrington, PA). The multiplication of enterococci and *E. coli* in biofilm was documented by using PNA FISH (peptide nucleic acid probes and fluorescence in situ hybridization) (AdvanDx Inc., Woburn, MA) and visualized using fluorescent microscopy.

Subsequently, sections of PVC pipe and concrete coupons were placed in the Dover Drive storm drain for two weeks before removal. Some of the enterococci and fecal coliform were adherent to the pipe and coupons and could not be removed by vigorous rinsing or washing. However, sonication freed up these adherent bacteria. These findings are consistent with biofilm formation.

In 2009, the city of Newport Beach and the staff of the Orange County Health Care Agency Water Quality Laboratory performed water-quality studies in a residential neighborhood where street gutters flow directly into the Dover Drive storm drain just upstream from the site where the earlier 2006 study was performed.

The goal of the current studies was to determine the sources of high numbers of enterococci and fecal coliform found in street gutter runoff flowing from residential areas.

Initially, studies were performed to determine the levels of fecal indicator bacteria entering street

gutters from a nearby residence. Bacteria-free hose water was used to wash down a driveway and a sidewalk for testing. Runoff water from flooding a residential front lawn was also analyzed. Runoff from a front yard garden where the runoff water exited through a hole cut through the curb and drained directly into the gutter was studied. Finally, a water sample from lawn sprinklers was tested to be certain it was bacteria free.

The following results were obtained: Bacteria counts in runoff from washing the sidewalk were 220 enterococci/100 ml and 180 fecal coliform/100 ml. Washoff water from the driveway was 160 enterococci/100 ml and 9 fecal coliform/100 ml. Runoff from flooding the grass contained 1,250 enterococci/100 ml and 2,000 fecal coliform/100 ml. Water draining directly into the gutter through a hole cut through the curb grew out 70 enterococci/100 ml and 100 fecal coliform/100 ml.

Most of the water entering the street gutters originated from misdirected sprinklers that sprayed directly onto the streets (Figure 2). Surprisingly, it was rare to see water entering the gutters from overwatering lawns. The amount of water in the usual sprinkler cycle apparently did not oversaturate lawns and cause runoff.

Flows from holes in the curb directly into the gutter usually indicate drainage either from backyard and side yard patios or from roof gutter drains plumbed to flow directly into the street gutter. Repeated checks of these curb holes during the summer and fall study period did not identify any other than the one measurable flow described above. There is need to gather more information to determine if these occasional flows contain high levels of enterococci or fecal coliform bacteria.

No dog excrement was observed during the time that the bacterial samples were obtained. However, a number of dog walkers were observed bagging their dogs' fecal material for proper disposal.

urther studies were performed to determine if enterococci and fecal coliform bacteria were growing in the street gutters and could be responsible for high indicator bacteria counts found in gutter water.

Figure 2. Sprinklers overshooting lawn onto street

The first study was performed on July 8, 2009, and was designed to measure fecal indicator bacteria concentrations in a street gutter draining from 10 residential homes. Bacteria-free hose water was introduced into a dry street gutter and tested for enterococci and fecal coliform at 10 meters, 45 meters, and 100 meters downstream when the flow from the hose water reached those locations. There was a progressive rise of both enterococci and fecal coliform bacteria with the increased distance of flow. The levels of fecal indicator bacteria were 26,000 enterococci/100 ml and 14,000 fecal coliform/100 ml when the water reached the 100-meter test site, the last testing station (Figure 3). The source of these high numbers of bacteria is suspected to be coming from regrowth in the street gutters.

The EPA's single sample standard is 104 enterococci/100 ml.

The second study was performed on September 18, 2009, and utilized the same

Figure 3. Sample collection 100 meters downstream

Figure 4. Street sweeper

impact of street sweeping on these high fecal indicator bacteria counts. Street sweeping of the 100-meter stretch of street gutter was performed by the city of Newport Beach using a street sweeper equipped with rotating brushes and vacuum cleaning equipment to pick up particulates in the gutter (Figure 4). Again, bacteria-free hose water was introduced into the same street gutter. Water samples collected at the 100-meter sampling station revealed markedly reduced fecal indicator levels of 1,550 enterococci/100 ml and 870 fecal coliform/100 ml.

The third study took place between October 5, 2009, and October 27, 2009, and was designed to determine if the high fecal bacterial counts found in the street gutter water were due to replication of these bacteria growing in street gutter biofilm.

It was noted that the street gutter across the street from the previous testing site had a more abundant growth of slime or suspected biofilm (Figure 5), because street sweepers had not been able to clean that street gutter for weeks. This street gutter drains a separate watershed of 30 homes, with all runoff flowing four blocks before emptying into the Dover Drive storm drain near the site of the 2006 biofilm study.

Sampling of this suspected biofilm identified up to 9 million enterococci and 6 million fecal coliform per 100 grams (equivalent to 100 ml) of biofilm. These biofilm samples were sonicated to release entrapped bacteria, and the levels were validated with split sampling. Gutter water samples flowing over the biofilm contained 5,500 enterococci and 3,600 fecal coliform/100 ml.

To determine if this biofilm, or slime, was contributing bacteria to the runoff in the gutter, bacteria-free hose water was introduced into the dry gutter and was sampled 60 feet downstream. This test was performed to determine if the biofilm-like material was shedding enterococci or fecal coliform as the bacteria-free hose water flowed over the moist biofilm. Enterococci and fecal coliform levels in the water sampled 60 feet downstream were reported to contain 3,200 enterococci/100 ml and 230 fecal coliform/100 ml. It is suspected that these bacteria were free-floating planktonic forms of bacteria that were shed from the underlying biofilm.

At the time of testing, the biofilm-like slime had formed a coalescent film covering virtually the entire gutter surface.

On October 23, 2009, a gardener was seen washing off large paved areas at a home located 100 feet upstream from the gutter testing site. This water was seen flowing in the gutter for four blocks before entering the Dover Drive storm drain. There was no other water input from the side streets at that time. The bacterial counts in the gutter water just prior to entering the Dover Drive storm drain contained 38,000 enterococci/100 ml and 5,200 fecal coliform/100 ml, indicating that the gutter water apparently picked up more bacteria from the street gutter along the four-block flow path.

On October 14, 2009, there was a significant rain event that washed away nearly all of the slime/biofilm in the gutter. Subsequently, an 8-foot stretch of gutter was vigorously scraped with a putty knife to remove any remaining visible slime/biofilm from that section of gutter, and the gutter was observed over the next month (Figure 6).

Figure 5. Slime or biofilm in street gutter

Figure 6. Photo looking down at street gutter. The dark patches show biofilm re-forming in the gutter after it was scraped clean of biofilm two weeks earlier.

Four days after scraping the gutter, small patches of slime/biofilm were seen reforming on the scraped areas. Two small samples of biofilm were obtained and tested. The first contained 120,000 enterococci/100 grams and 10,000 fecal coliform/100 grams. The second sample contained 870,000 enterococci/100 grams and 460,000 fecal coliform/100 grams.

By five days after the slime removal, patches of the suspected biofilm growing in the gutter were larger and contained 2,060,000 enterococci/100 grams and 10,000 fecal coliform/100 grams. The last sample of new growth of biofilm was tested at one month after slime removal, and bacterial levels were 670,000 enterococci/100grams and 24,000 fecal coliform bacteria (Table 1).

The findings of these studies provide evidence that regrowth of both enterococci and fecal coliform bacteria are occurring in biofilm located in residential street gutters and storm drains in Newport Beach. It is suspected that these biofilm bacteria may be responsible for some of the high levels of enterococci and fecal coliform bacteria reaching Newport Bay from residential neighborhood runoff.

These findings raise important questions as to whether enterococci and fecal coliform bacteria replicating in biofilm located in street gutters and storm drains confound testing for fecal contamination and potential health issues. Health officials agree that enterococci and fecal coliform bacteria originating from human fecal sources indicate a health risk to swimmers not because of the presence of *E. coli* and enterococci but because of the presumed presence of human enteric viruses. It is the enteric viruses, including Enterovirus, Adenovirus, and Norovirus, that are believed to be the primary cause of swimmer-related gastrointestinal illnesses (Glass et al. 2009). These enteric viruses multiply in the human gut but not in the environmental biofilms such as those found in street gutters or storm drains.

If these study findings are substantiated by others, the focus of remediation should be on best management practices to reduce the bacterial biofilms in street gutters, catch basins, and storm drains.

Frequent street sweeping, cleaning out the catch basins of biofilm material, using storm drain filters to remove debris, reducing water usage for landscape irrigation, filling in pooling locations in residential street gutters where replication can occur, and focusing on proper placement of sprinklers to prevent water from being sprayed directly into street gutters all play an important role in reducing gutter biofilm growth.

The findings of these gutter studies provide a logical explanation for elevations of fecal coliform and enterococci found in urban runoff in the absence of human fecal contamination.

Author's Bio:

John F. Skinner, M.D., is a medical doctor in Newport Beach, CA, and a diplomate with the American Board of Internal Medicine.

Author's Bio: *Joseph Guzman is the supervising public health microbiologist for the Orange County, CA, Public Health Water Quality Laboratory.*

Author's Bio: *John Kappeler is the code and water-quality enforcement management for the city of Newport Beach.*

Topics:

- Bacterial Detection
- Research
- Water-quality Monitoring

Review of the Newport Bay Copper Reduction Project

presentation by Ray Hiemstra

Project Basics

- A four year voluntary program to assist boaters in Newport Bay to reduce the use of Copper and other biocide boat bottom paints.
- The purpose of the project was to reduce dissolved copper concentrations in Newport Bay.
- To proactively deal with copper (and other metals) that are included in the Newport Bay Toxics TMDL.

Who was involved

- Funded by USEPA 319h Grant
- Administered by Santa Ana Regional Water Quality Control Board
- Run by Orange County Coastkeeper with assistance from Institute for Research and Technical Assistance, and the City of Newport Beach

Outline

- Education program
- Financial Incentive Program For Balboa Yacht Basin boaters
- Water monitoring program to document progress in reducing copper levels.

Education Program

- Newport Bay Specific
- Harbor wide Workshops, educational materials distribution
- Focused program at Balboa Yacht Basin

Incentive Program

- Focused personal contact program at Balboa Yacht Basin
- Incentives were based on input from stakeholders.
- Incentives applied to nonbiocide paints only.

Incentive Program Outcomes

- 10 boats were converted
- Estimated reduction of 72.78 pounds of copper per year in the bay
- 4 types of coatings were used

Water Monitoring

- Occurred at the beginning and end of the project
- Eight sample sites
- Established baseline conditions and tracked dissolved copper concentrations.

Other Components

- Work with boaters to identify cost effective non-biocide bottom paint options
- Work with boatyards to provide non-biocide paint services
- Work with paint manufacturers to introduce non-biocide paints to Newport Bay Boaters
- Non binding city resolution to encourage the use of non-biocide paint.

Port of San Diego "Safer Alternatives to Copper Antifouling Paints" Project

- Performance, Longevity, Cost
- 46 Test Coatings
- Non Biocide and Biocide Paints

Paint Alternatives

- 4 types of non-copper paint were used

  Intersleek 900

  Hempasil X3

  Thorn-D

  Bottomspeed

Intersleek 900

- Used on Piseas II & Sky Sail

Hempasil X3

- Used on one boat: Cleansweep

Thorn-D

- Coating was used on boats Miss Betty Mako Madness
- Non biocide foil coating

Bottomspeed

- Used on Liberty bell, Ralphee, Livin Large, Diversion, & Rio

Next Steps

- Continue education program
- Work with boat yards
- Develop incentives
- Copper TMDL

AB 425 Atkins

- *No later than February 1, 2014, the Department of Pesticide Regulation shall determine a leach rate for copper-based antifouling paint used on recreational vessels and make recommendations for appropriate mitigation measures that may be implemented to address the protection of aquatic environments from the effects of exposure to that paint if it is registered as a pesticide.*

Summary

- Copper continues to exceeds USEPA water quality criteria in Newport Bay
- The copper reduction project proactively addresses a long term problem by reducing copper inputs
- Financial incentive increases participation
- Contact information
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Final Report
http://iaspub.epa.gov/pls/grts/f?p=110:700:::NO:RP,700:P700_PRJ_SEQ:51775