The Strategy’s seven iterative steps to ensure our Bay work is aligned with the most important goals and highest priorities:

1. Identify key uses and key areas;
2. Conduct assessments;
3. Set priorities;
4. Set measurable goals;
5. Realign work;
6. Track progress; and
7. Periodically reevaluate priorities.
Key Uses

Key uses are categories of water quality-dependent uses that are most critical to consider.

Key uses of the Bay are:

1. Water recreation; contact and non-contact
2. Human consumption of fish and shellfish; and
3. Habitats and ecosystems.
Monitoring & Assessment Framework

Conditions Monitoring: M1

Stressor Identification: M2

Source Identification: M3

Performance Monitoring: M4

Permit Modifications
Restoration Funding
Cleanup Orders
Total Maximum Daily Loads

Protect!
Presentation Outline

• Fish and Shellfish Consumption
• Water Contact Recreation
• Next Steps
• Port Presentation
• Closing Remarks
Acknowledgements

Brock Bernstein
Key Areas for Fish and Shellfish Consumption

Key areas are locations within or along the Bay that are intensively used and/or are particularly important for a key use.

Legend

- Shorelines
- Docks, Piers, and Wharfs
Persistent Bioaccumulative Toxic Substances

Biotoxins

Human Pathogens

Fish = bony and cartilaginous fish

Shellfish = filter feeding bivalves

Crustaceans = crab & lobster

Contaminants and Organisms (images not to scale)
<table>
<thead>
<tr>
<th>Matrix</th>
<th>Program</th>
<th>Lead Entity</th>
<th>Year(s)</th>
<th>Constituents measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>fish tissue</td>
<td>Southern California Bight Regional Monitoring Program</td>
<td>Southern California Coastal Water Research Project (SCCWRP)</td>
<td>2013-2014</td>
<td><strong>Persistent, Bioaccumulative, Toxic Substances</strong>: mercury, PCBs, DDTs, chlordanes, dieldrin, PAHs (some samples), PBDEs, &amp; other “constituents of emerging concern”</td>
</tr>
<tr>
<td></td>
<td>Regional Harbor Monitoring Program</td>
<td>Port of San Diego</td>
<td>2013</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shallow Water Habitat Survey</td>
<td>City of San Diego</td>
<td>2014</td>
<td></td>
</tr>
<tr>
<td>lobster tissue</td>
<td>Surface Water Ambient Monitoring Program</td>
<td>Water Boards</td>
<td>2014-2015</td>
<td>PCBs, metals, &amp; pesticides (including DDTs)</td>
</tr>
<tr>
<td>mussel tissue</td>
<td>Mussel Watch</td>
<td>National Oceanic and Atmospheric Administration</td>
<td>2010-2015</td>
<td>PCBs, PAHs, metals, &amp; pesticides (including DDTs)</td>
</tr>
<tr>
<td>clam &amp; mussel tissue</td>
<td>Marine Biotoxin Monitoring Program</td>
<td>California Department of Public Health</td>
<td>2011-2016</td>
<td><strong>Marine Biotoxins</strong>: domoic acid &amp; paralytic shellfish poison (PSP) toxins</td>
</tr>
<tr>
<td>water</td>
<td>Beach and Bay Monitoring Program</td>
<td>San Diego County Department of Environmental Health</td>
<td>2014-2016</td>
<td><strong>Fecal Indicator Bacteria</strong>: total coliform</td>
</tr>
</tbody>
</table>
Data Sources & Thresholds

- Persistent Bioaccumulative Toxic Substances → OEHHA Advisory Tissue Levels (ATLs)
- Marine Biotoxins → FDA action levels for domoic acid and PSP toxins
- Fecal Indicator Bacteria → Basin Plan SHELL Total Coliform Objective (water column)

(images not to scale)
Are fish safe to eat?

A Healthy Guide to Eating Fish from San Diego Bay

Women 18-45 years and children 1-17 years

Low | Medium | High
---|---|---

Chemical Meter

Diamond turbot
Spotted turbot
Black perch
Pile surfperch
Rainbow seaperch
California lizardfish

Pacific chub mackerel
Round stingray
Shovelnose guitarfish

Barred sand bass
Spotted sand bass
Shiner perch
Topsmelt
Yellowfin croaker
Leopard shark
Gray smoothhound shark

2 servings a week or 1 serving a week

Do not eat
A Healthy Guide to Eating Fish from San Diego Bay

Women over 45 years and men can safely eat more fish

- Diamond turbot
- Spotted turbot
- Black perch
- Pile surf perch
- Rainbow seaperch
- California lizardfish
- Round stingray
- Shovelnose guitarfish
- Spotted sand bass
- Barred sand bass
- Yellowfin croaker
- Pacific chub mackerel
- Leopard shark
- Gray smoothhound shark

2 servings a week OR 1 serving a week

- Do not eat
- Shiner perch
- Topsmelt
Results-Fish & Lobster

2013-15 data show continued impairment due to mercury and PCBs

- California halibut (n = 8)
- Pacific chub mackerel (n = 3)
- Spotted sand bass (n = 9)
- California spiny lobster (n = 29)
- Round stingray (n = 2)
- Topsmelt (n = 1)
Results - Shellfish

Persistent Bioaccumulative Toxic Substances
Total Coliform
Marine Biotoxins

△ Exceeded thresholds
▲ Did not exceed thresholds
▽ No data available

★ = area of special importance
Data Gaps

- Consumption information
- Fish
  - Site fidelity
  - Age/growth analyses
- Shellfish
  - Additional sampling locations
    - Marine biotoxins
    - Bioaccumulative substances
  - Additional species
  - Cyanotoxins
Water Contact Recreation
Assessment Considerations:

- **Beneficial Use** [REC-1]
- **Risk Receptors** [Human Health]
- **Risk Indicators** [Enterococcus]
- **Areas of Special Importance** [Beaches]
- **Spatial Representation** [North / South / East / West]
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- **Risk Receptors** [Human Health]
- **Risk Indicators** [Enterococcus]
- **Areas of Special Importance** [Beaches]
- **Spatial Representation** [North / South / East / West]
- **Available Data** [SDUPD / SDCDEH]
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- **Risk Indicators** [Enterococcus]
- **Areas of Special Importance** [Beaches]
- **Spatial Representation** [North/South/East/West]
- **Available Data** [SDUPD/SDCDEH]
- **Risk Thresholds** [SSM/GM Exceedances >10%]
- **Temporal Variations** [Dry Season/Wet Season]

Key to Sampling Stations:
1 - Kellogg Beach
2 - Shelter Island Shoreline Park
3 - Spanish Landing Park
4 - Coronado Tidelands Park
5 - Glorietta Bay Park
6 - Bayside Park
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1 - Kellogg Beach
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Enterococcus – Dry Season [MAY 1 – SEPTEMBER 30]
Single Sample Maximum Results
Enterococcus – Dry Season [MAY 1 – SEPTEMBER 30]
Single Sample Maximum and 30-Day Geometric Mean Results

Key to Sampling Stations:
1 - Kellogg Beach
2 - Shelter Island Shoreline Park
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4 - Coronado Tidelands Park
5 - Glorietta Bay Park
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Single Sample Maximum

Key to Sampling Stations:
1 - Kellogg Beach
2 - Shelter Island Shoreline Park
3 - Spanish Landing Park
4 - Coronado Tidelands Park
5 - Glorietta Bay Park
6 - Bayside Park

Enterococcus – Wet Season [October 1 – April 30]
Single Sample Maximum Results
Enterococcus – Wet Season [OCTOBER 1 – APRIL 30]
Single Sample Maximum and 30-Day Geometric Mean Results
2014-2016 Assessment Summary

• Dry Seasons [MAY 1 – SEPTEMBER 30]:
  LOW RISK to human health
  - except potential risk to human health at Shelter Island Shoreline Park

• Wet Seasons [OCTOBER 1 – APRIL 30]:
  INCREASED RISK to human health
  - potential risk to human health at Glorietta Bay, Tidelands, and Bayside Parks
  - highest potential risk to human health at Shelter Island Shoreline Park
Future Assessment Needs / Wants

- Complete wet season data
- More data during and/or after storms
- Additional locations
- Additional indicators to provide better linkage between indicator bacteria and actual risk for human illnesses
Next Steps
1. Status sheets for REC1 and FSC
2. Assessments of Habitats and Ecosystems & non-contact water recreation
3. Develop Bay-wide monitoring program
4. Advance M2 & M3 of the Monitoring Framework

Strategy Steps
1. Identify key uses & key areas;
2. Conduct assessments;
3. Set priorities;
4. Set goals;
5. Realign work;
6. Track progress; and
7. Reevaluate priorities.