Spatial comparison of PBTs in marine fish and invertebrates from King County waters

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Spatial Comparison of PBTs in Marine Fish and Invertebrates from King County Waters

Rory O’Rourke, Jenée Colton, Debra Williston, Deb Lester

Salish Sea Ecosystem Conference: April 2018
Monitoring Program Goals
Marine Tissue Monitoring – Sampling Events

- Dungeness and Red rock crabs – 2014, 2018
- English sole and rockfish – 2015, 2017
- Market squid – 2016
- Forage fish - 2020
Sampling Locations - Dungeness and Red Rock Crab

- 6 sample locations
- Parameters
  - PCBs
  - Metals
- Composite Samples
  - Muscle
  - Hepatopancreas
Dungeness Crab - Arsenic

Mean Arsenic Concentration mg/kg ww

- **Hepatopancreas**
- **Muscle**

<table>
<thead>
<tr>
<th>Location</th>
<th>North</th>
<th>South</th>
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<tbody>
<tr>
<td>Shilshole N</td>
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<tr>
<td>Shilshole S</td>
<td>n = 2</td>
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<tr>
<td>Terminal 86</td>
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<td>n = 3</td>
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<tr>
<td>Duwamish Head</td>
<td>n = 2</td>
<td>n = 3</td>
</tr>
</tbody>
</table>

Shilshole N
Shilshole S
Terminal 86
Duwamish Head

> South
Dungeness Crab - PCBs

King County
WDFW
Tissue Equivalent Criterion

Muscle
Hepatopancreas
English sole

Source: WDFW
Rockfish (Copper pictured)

Body variable in color, olive brown to copper with pink or yellow blotches

Rear 2/3 of lateral line is light in color

Usually 2 dark bands radiating backwards from eye

Source: WDFW
English Sole/ Rockfish Trawl Locations

- 6 trawl locations
- Parameters
  - PCBs
  - PBDEs
  - Metals
- Composite Samples
  - Fillet (English sole)
  - Whole (Rockfish)
Rockfish Contaminants & Age

Similar trends observed with Hg and PCBs ($R^2 = 0.76 - 0.85$)
Market squid

Image Courtesy WDFW
Market squid ocean-to-Sound migration

Image courtesy WDFW
Conclusions

• Observed small spatial scale differences.
• PCBs higher in inner Elliott Bay for crab, English sole, and rockfish.
• Confirms findings from WDFW’s TBiOS crab report.
• Decrease in mercury observed in squid between 1997 and 2016.
Future Work

• Evaluate changes in contaminants in biota over time.
• Continue sharing information with partners.
• Compare to WDFW’s historic rockfish data to evaluate bioaccumulation trends.
Acknowledgements

• King County Environmental Laboratory staff
• Water and Land Resources Fisheries Ecologists
• WDFW
  • TBiOS Program
  • Groundfish Trawl Survey
  • Aging Lab
• F/V Chasina: Kurt Dobzinsky and crew
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Questions?