Mouth of Columbia River

2013 & 2014 Surveys

Shallow Water Site
Deep Water Site

Bridgette Lohrman
EPA Region 10 – Ocean Dumping Program

LCSG – Mouth of Columbia River
Science & Policy Workshop
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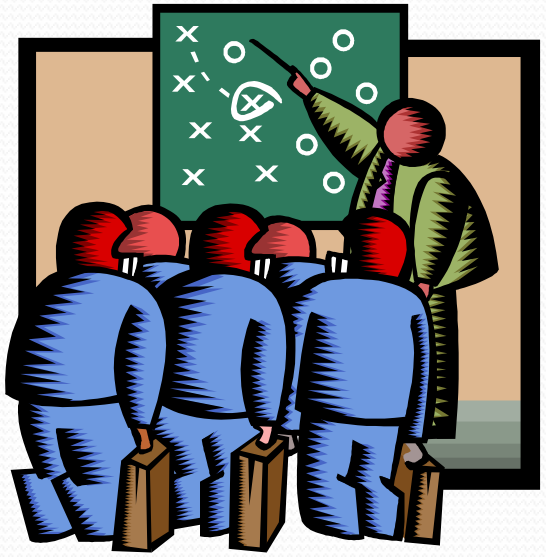
Today's Talk

Focus on Shallow Water Site and Deep Water Site

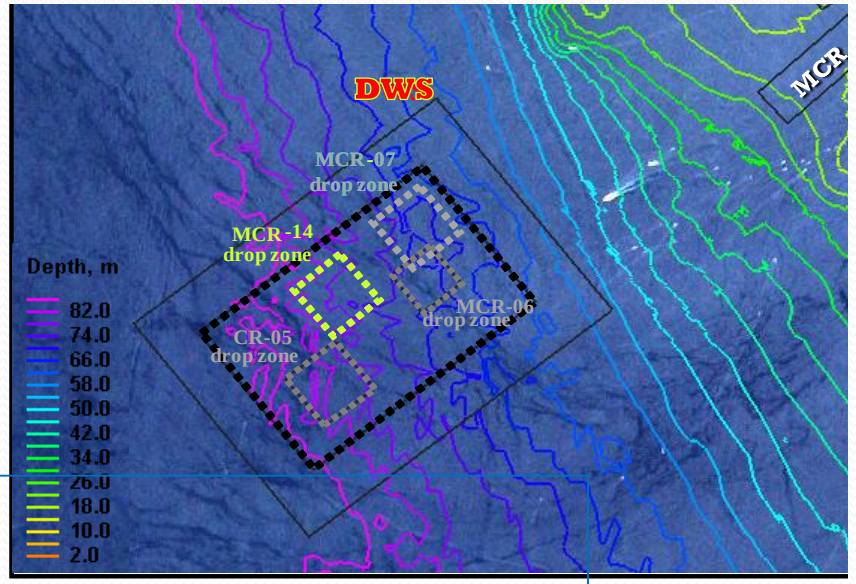
- 2013 surveys
- 2014 surveys
- What's next?



2013 Field Work - Deep Water Site

Drop Zone 7

- 368 acres
- Used 2007 through 2013
- Depth: 195-230 feet



Goals

#1. Has material moved outside of Drop Zone 7?

#2. Do we need to update estimate of site life?

#3. Has the material in Drop Zone 7 become coarser?

#4. What is the status of benthic infauna?

2013 Field Work - Deep Water Site

Methods

#1. Has material moved outside of Drop Zone 7?

- Hydrographic survey – high resolution multibeam and side scan sonar (593 acres)
- Sediment profile imaging (25 stations within DZ-7; 11 stations outside DZ-7)

#2. Update estimates of long-term site capacity.

- Hydrographic survey – high resolution multibeam and side scan sonar
- Sediment profile imaging
- Sediment grabs (4 stations within DZ-7; 2 stations outside DZ-7)

2013 Field Work - Deep Water Site

Methods

#3. Has the material in drop zone become coarser over time?

- Sediment grabs
- Sediment profile imaging - grain size

#4. What is the status of benthic infauna?

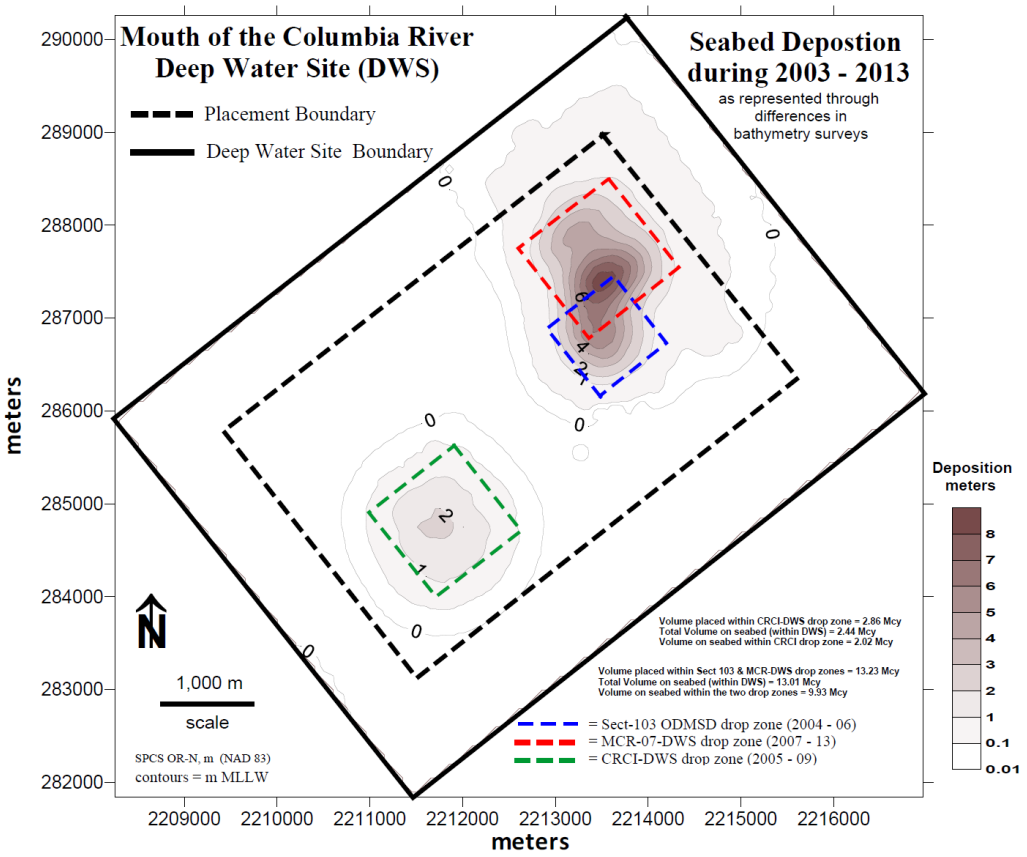
- Sediment profile imaging – infaunal successional stage

2013 Field Work - Deep Water Site

Results

#1. Has material moved outside of drop zones?

- Yes – material moving north and south.
- 75% material remains within drop zones
- Active bottom transport processes



2013 Field Work - Deep Water Site

Results

#2. Update estimates of long-term site capacity.

- Original: Assumed 4.5 Mcy/year dumped at DWS. 225 Mcy (50-year life-cycle).
- Updated (2013): 2004 – 2013 average volume dumped at DWS is 1.8 Mcy/year. 125-year life cycle.

#3. Has the material in drop zone become coarser over time?

- Likely. Grain size analysis and Sediment Profile Imaging both indicate finer-grained sediments outside DropZone7 versus Inside DropZone7.
  - Inside DropZone7 = 97% fine-sand, 3% fine-grained
  - Outside DropZone7 = 90% fine-sand; 10% fine-grained

2013 Field Work - Deep Water Site

Results

#4. What is the status of benthic infauna?

- Inside DropZone7 = Stage I (no organisms visible or only a few polychaete tubes on surface)
- Outside DropZone7 = Stage I on III

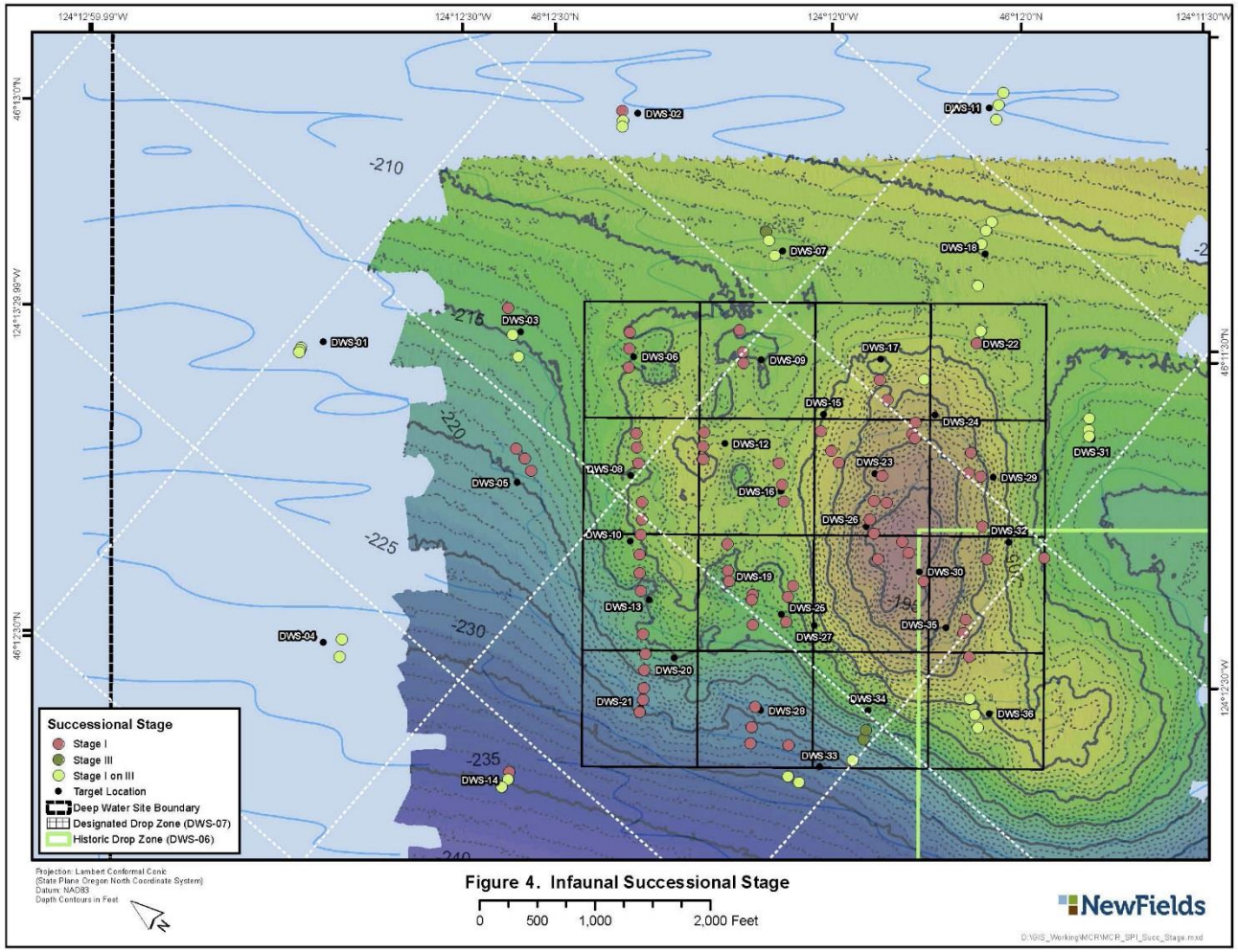


Figure 4. Infaunal Successional Stage

2013 Field Work - Deep Water Site

What did we learn?

#1. Has material moved outside of DropZone 7?

- Yes – Modify original assumptions of no movement of material.
- Extend bathymetric survey area to a larger perimeter around ODMDS.
- DWS can be used for a longer period of time.

#2. Update estimates of long-term site capacity.

- Updated information for future planning.

#3. Has the material in DropZone7 become coarser over time?

- Yes. Is this ecologically meaningful? Potentially.

#4. What is the status of benthic infauna?

- Infauna show response to dredged material disposal.

2014 Field Work
Shallow Water Site and Deep Water Site

Purpose

- Collect trend assessment data to update Site Management and Monitoring Plan (SMMP)
- Trend assessment surveys are the basis for past and future comparisons.
- SMMPs ensure disposal does not "*unreasonably degrade or endanger human health, welfare, the marine environment, or economic potentialities.*"

2014 Field Work – Shallow Water Site

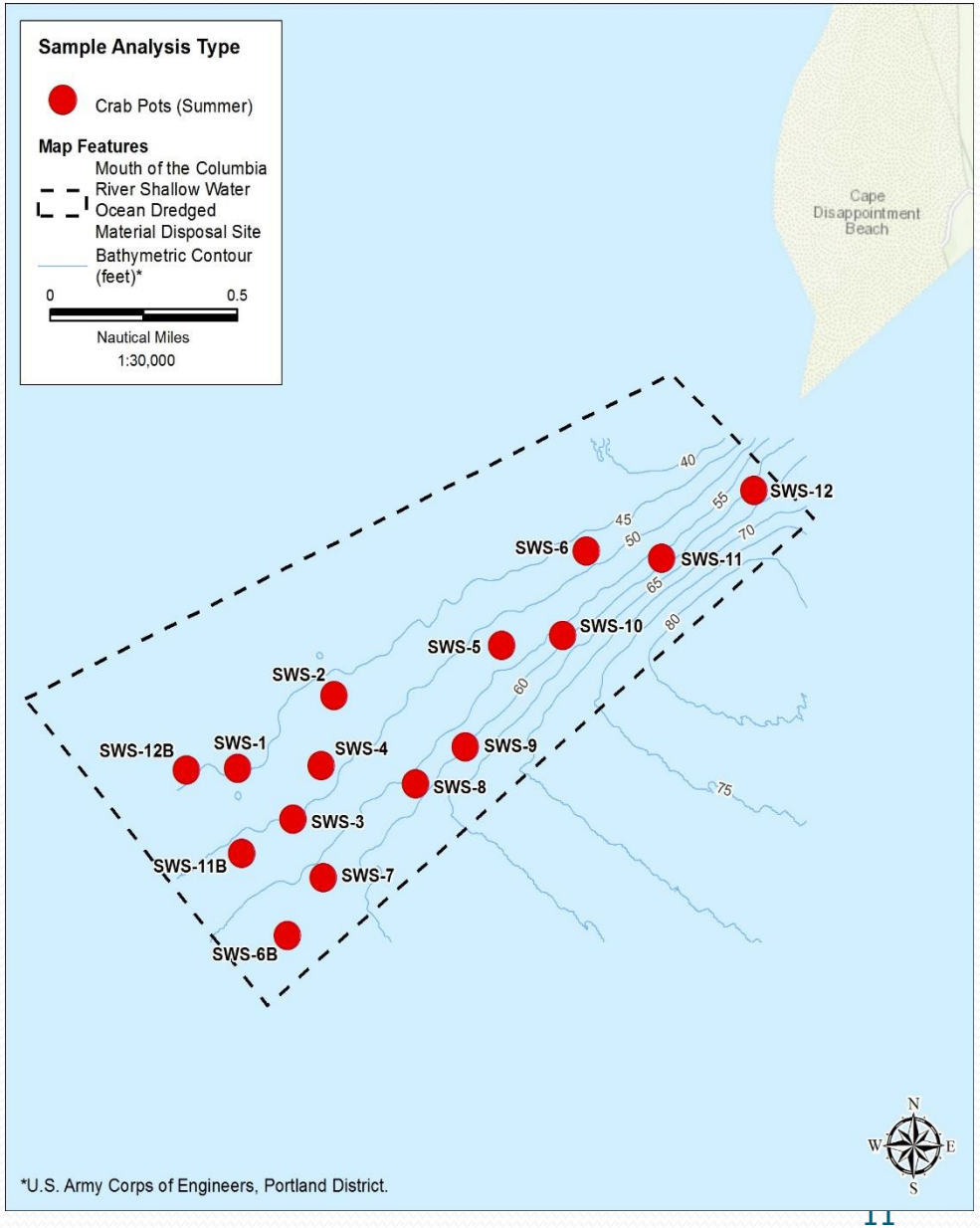
Goal – evaluate relative Dungeness crab abundance

Methods

- June 28-30
- 12 crab pots
- 2 – 24 hour soaks
- Crabs were sexed, measured and shell condition noted
- Difficult sea conditions to survey

What did we learn?

- CPUE similar to 2005 survey
- 423 crab caught
- Reconsidering utility of crab pot surveys



2014 Field Work – Deep Water Site

Goals

#1. Physical characterization of seafloor

#2. Chemical characterization – chemical analysis

#3. Infaunal community status – taxonomic identification

#4. Characterize fish and invertebrates on seafloor

#5. Assess relative abundance of Dungeness crab

2014 Field Work - Deep Water Site

Methods

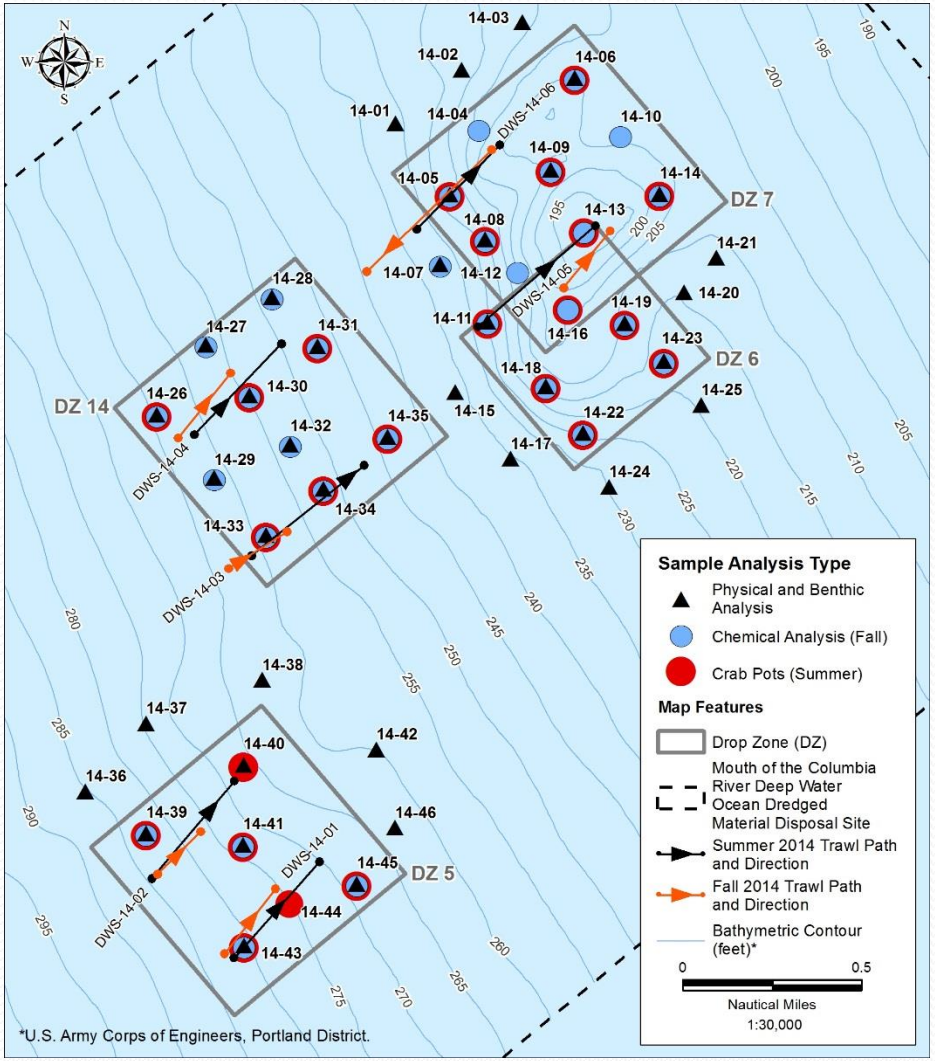
#1. Physical characterization - Grain size
- 40 stations
- Inside and near Drop Zones 5, 6, 7, 14

#2. Chemical characterization – chemical analysis
- 30 stations
- Inside Drop Zones 5, 6, 7, 14

#3. Infaunal community – taxonomic i.d.
- 40 stations (summer)
- 40 stations (fall)
- Inside and near Drop Zones 5, 6, 7, 14

#4. Characterize fish and invertebrates on seafloor
- 6 trawls (summer). 2 trawls per drop zone: 5, 7, 14
- 6 trawls (fall). 2 trawls per drop zone: 5, 7, 14

#5. Relative crab abundance
- 24 stations (summer)

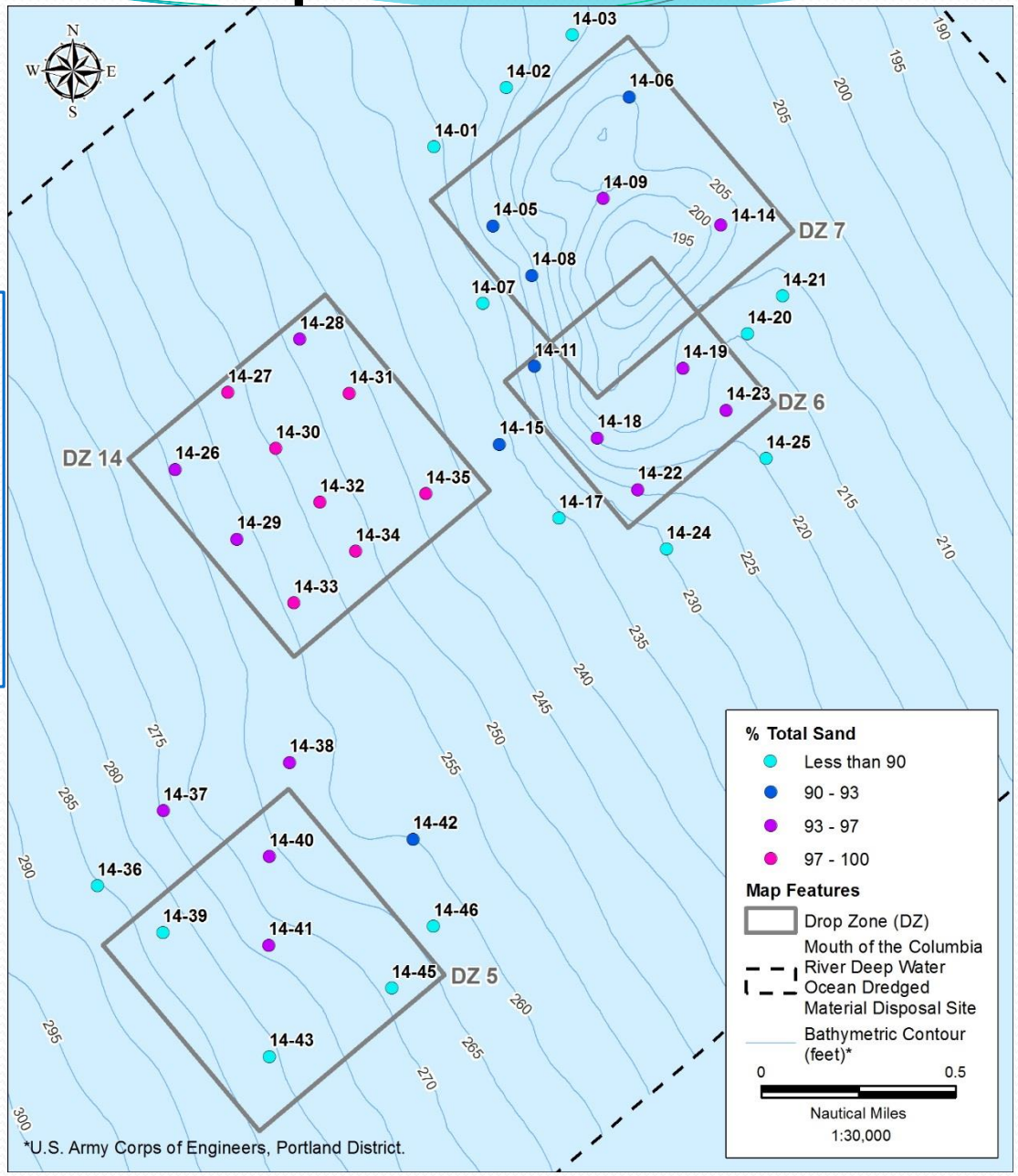


2014 Field Work - Deep Water Site

Results

#1. Physical characterization - Grain size

- Finer-grained sediments outside drop zones



2014 Field Work - Deep Water Site

Results

#2. Chemical analysis

- Analyzed for routinely sampled chemicals in Pacific Northwest.
- All chemicals either non-detected or below regional guidelines.

#3. Infaunal community status – taxonomic identification

- Drop zones (5,6,7): abundance and density greater in Fall than Summer
- Diversity and Richness metrics similar between Fall and Summer, except for Drop Zone 14
- Drop Zone 14: Density and richness lower in Fall (during disposal); diversity less affected.

#4. Characterize fish and invertebrates on seafloor

- Species, abundance, and density similar to 2005
- More species caught in Summer than Fall
- Catch dominated by: Pacific sanddab, rex sole, blackbelly eelpout, slender sole, slim sculpin, and dover sole.
- Most fish were juveniles

2014 Field Work - Deep Water Site

Results

#5. Relative crab abundance

- 1,044 crab caught
- 2005 CPUE = 21.0; 2014 CPUE = 21.8

2014 Field Work - Deep Water Site

What did we learn?

#1. Dredged material slightly more coarse than ambient sediments.

- Further analysis – comparison of benthic infaunal communities before and after disposal. Determine level of significance, if any, in change of infauna.

#2. Confirmed that the dredged material disposed at DWS is not contaminated.

#3. Infaunal community – Benthic community rebounds after several years of non-disposal.

#4. Based on success of the benthic sled, reconsidering utility of trawls in future surveys.

#5. Reconsidering utility of crab pot surveys.

What is EPA doing next?

- Review 2016 Annual Use Plan
- Revise Site Management and Monitoring Plan
  - Reviewing previous data: 2002, 2003, 2005, 2008, 2013, 2014, 2015
  - Completed prior to 2017 disposal season
- Engaged in LCSG – beneficial re-use of dredged material a priority. Less material disposed at Deep Water Site.
- Derelict fishing gear – removal with partnership of Oregon Dungeness Crab Commission

More Information?

Bridgette Lohrman (based in Portland)

Lohrman.Bridgette@epa.gov

503.326.4006

Thank you!