ANDERSON/KETRON SITE FATE AND TRANSPORT MODELING

SMARM 2015

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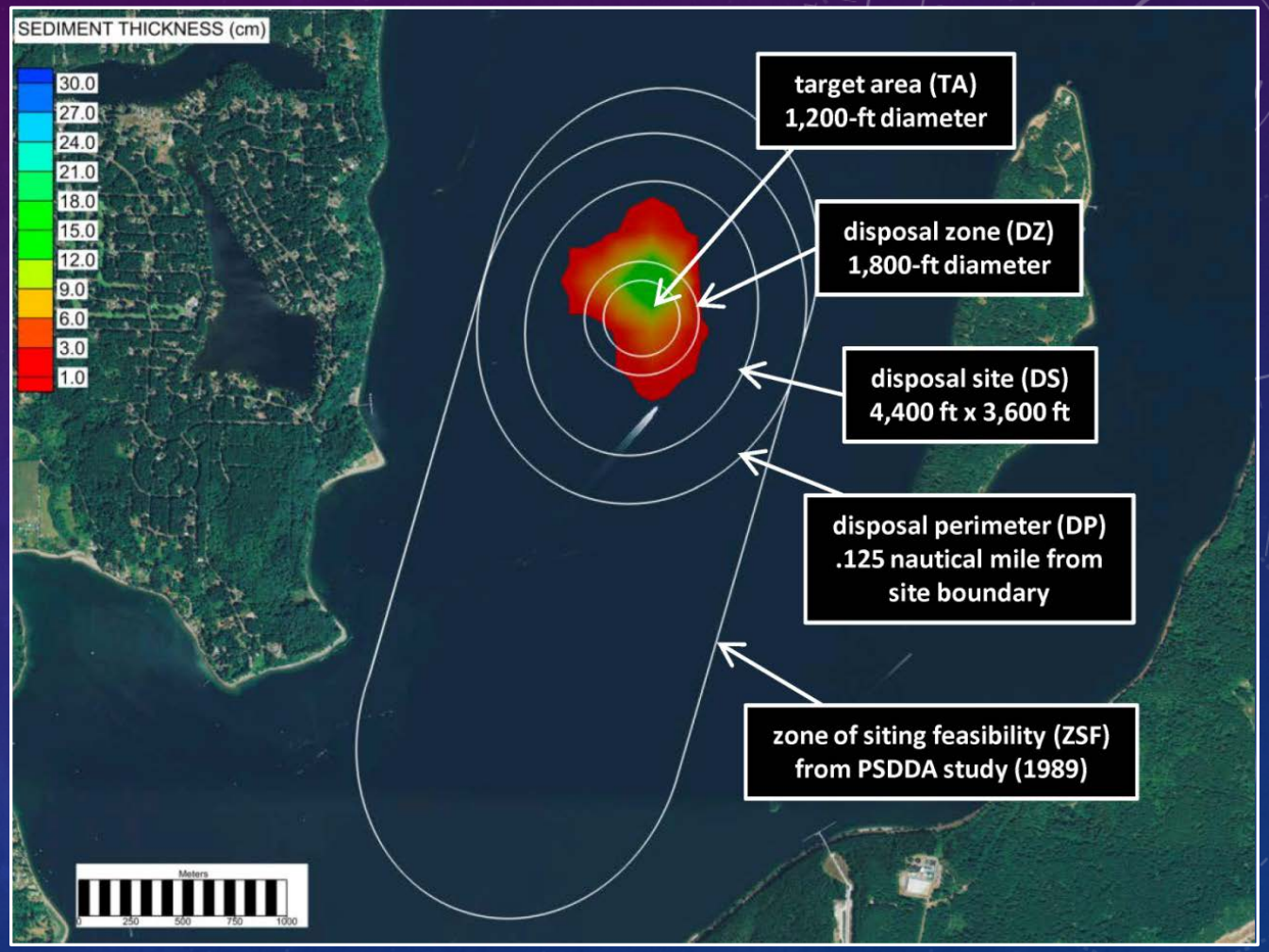
DESIGN MEMORANDUM

Final report published September 2014

- 3 models used

95% of material placed

- settles on bottom within 2 hours
- stays on bottom within site boundary



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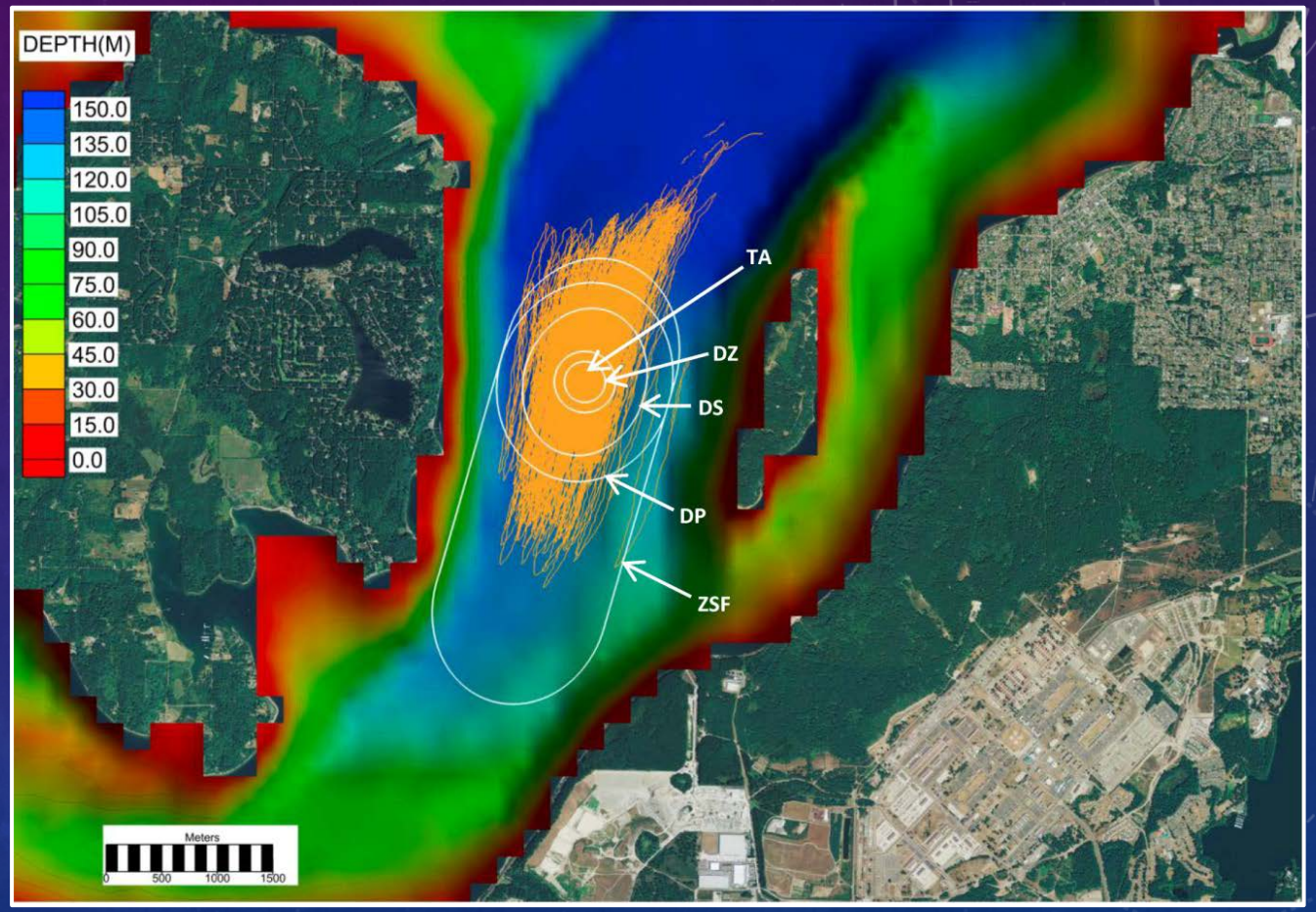
PARTICLE TRACKING MODEL

Estimated fate and transport of remaining 5%

- Shows Total excursion during simulation (2D model)
- 50% of suspended particles settle within disposal site after 48 hours (97-98% of total)
- Remaining material (2-3% of total) placed remains within bathymetric features at depths deeper than 100 meters



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SITE RELATIONSHIP WITH NISQUALLY DELTA

Multibeam hydrographic surveys

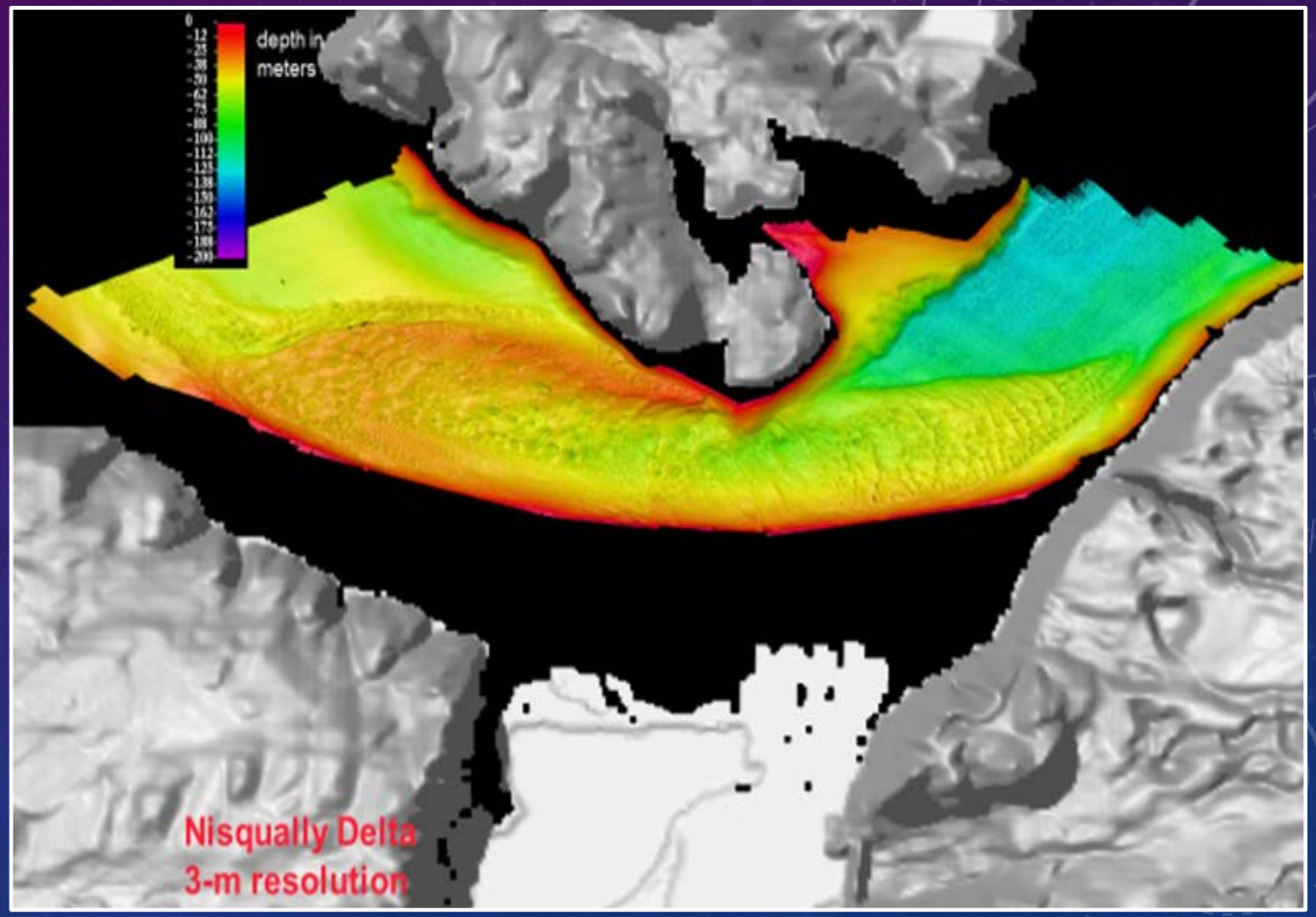
Strong currents develop sand wave bedforms

- dissipate at the 60 m contour

Disposal site outside of Delta area (and picture here)

- depth exceeds 100m

Suggest no active conduit for bedload transport between the 2 areas



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CONCLUSIONS

Model results confirm that the assumptions used during the original siting of the disposal site were accurate and that the site is acting as described in PSDDA (1989)

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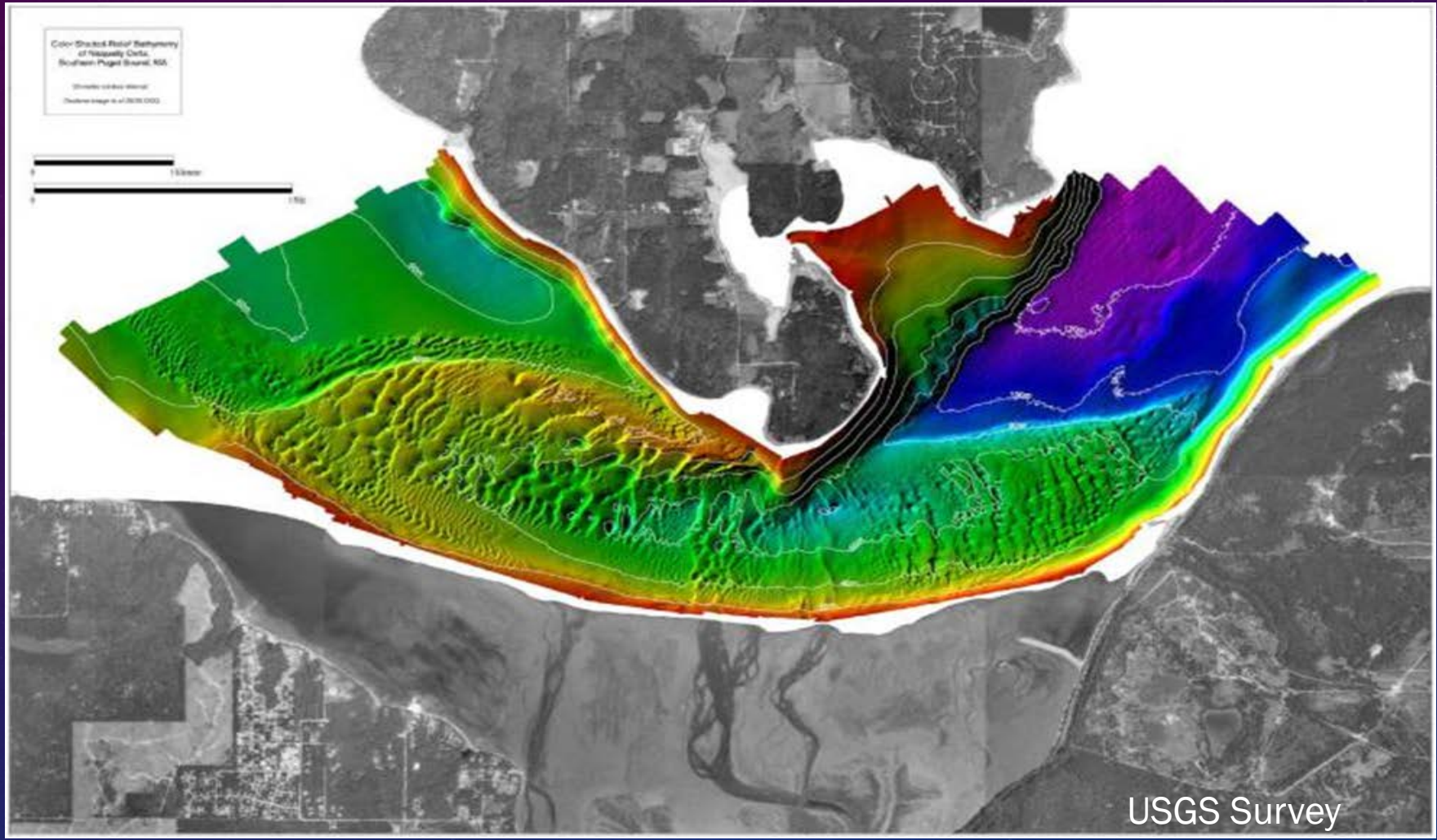

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SITE MONITORING TRAWL SURVEY

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ANDERSON/KETRON DISPOSAL SITING STUDY

Corps directed study

- Herrera and Newfields
- Interagency crew – WDFW, EPA, Corps, Ecology, DNR

Duplicate 1987 Siting Study

- 26 year time span

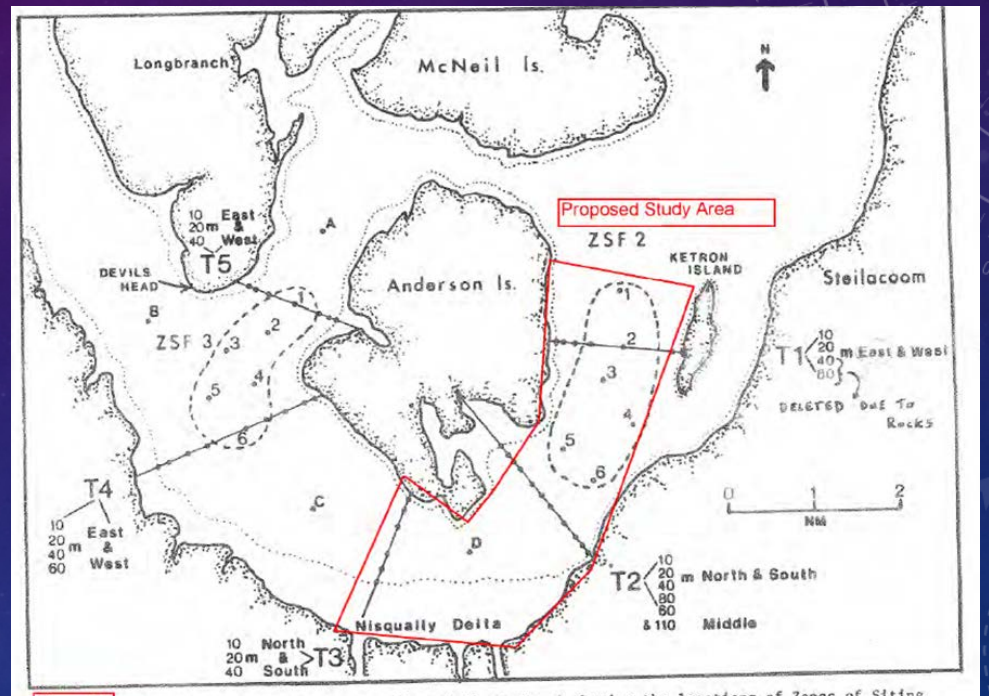

Figure 1. Map of the Nisqually region of south Puget Sound showing the locations of Zones of Siting Feasibility (ZSF) 2 and 3 and the stations sampled by beam trawl in and around the ZSF s in October 1987. The otter trawl stations were a subset of the beam trawl stations but included all ZSF 2 and 3 stations.

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STUDY INCLUDES DISPOSAL SITE AND SURROUNDING AREAS

Species diversity and abundance

- compare 1987 to 2014/2015
- On and around disposal site

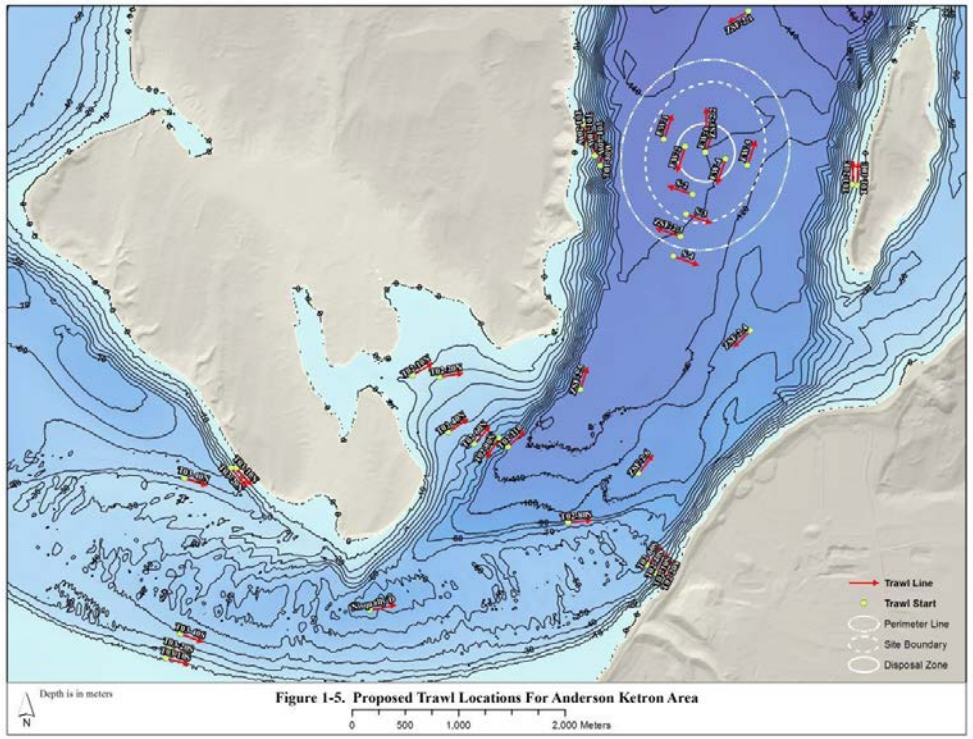

Figure 1-5. Proposed Trawl Locations For Anderson Ketron Area

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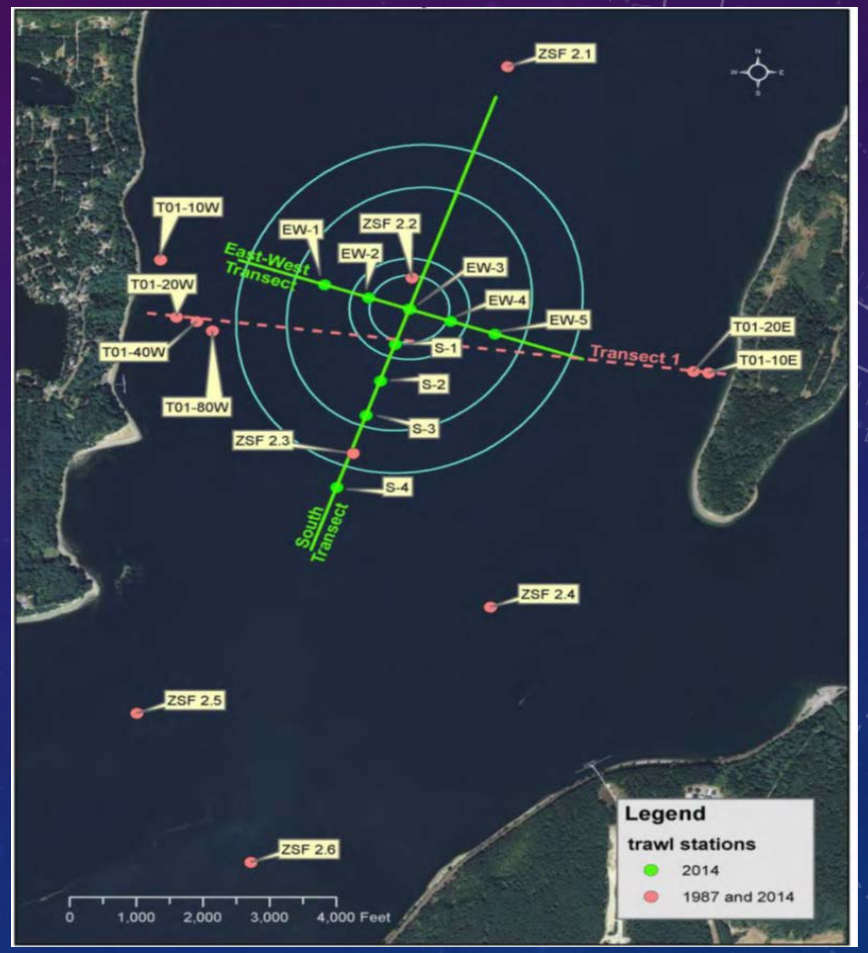
ANDERSON/KETRON DISPOSAL SITE

29 stations revisited throughout the study area

9 new stations added

- emphasis on the disposal site and immediate area outside of disposal site



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NISQUALLY RIVER AREA

Study will duplicate original siting transects in Nisqually Reach

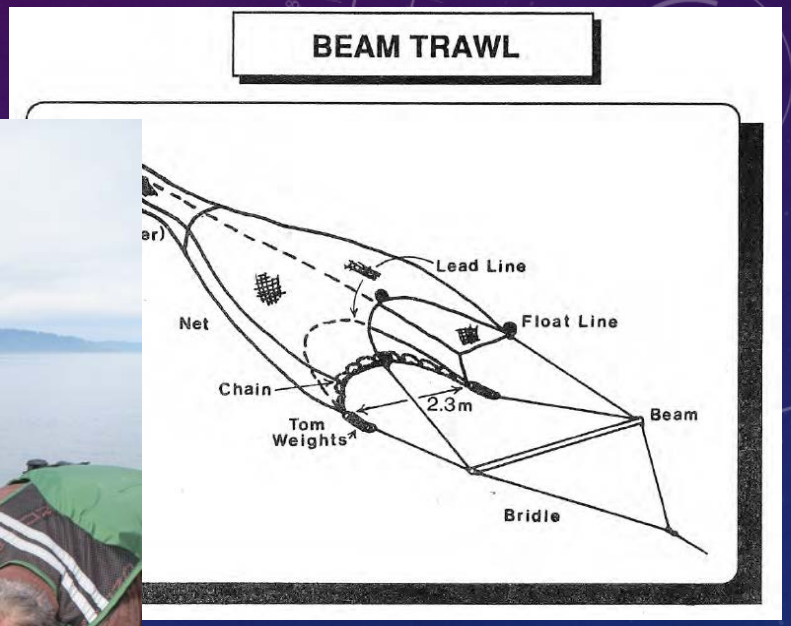
Provide wealth of information and 26 year comparison

FOUR SEASON BEAM TRAWL SURVEY

Direct comparison to 1987

- vessel, Skipper, trawl

July 2014, October 2014, February 2015, May 2015



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PRELIMINARY DATA TRENDS

5 categories from Dinnel et al (1988)

1) Dungeness Crab
2) Rock Crab
3) Pandalid Shrimp
4) Sea Cucumbers
5) Sea Stars

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PRELIMINARY DATA TRENDS

<u>Dungeness</u>

- not abundant in 1987 or 2014-15

<u>Rock</u> -includes Graceful crab

- may show increase in abundance (habitat type dependent)

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PRELIMINARY DATA TRENDS

<u>Pandalid Shrimp</u>

- 6 species
- appears to show some increased density over 1987

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PRELIMINARY DATA TRENDS

<u>Sea Cucumbers</u> – all sp.

- Generally similar to 1987

<u>Sea Stars</u> – all sp.

- Density similar to 1987

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NISQUALLY D STATION

Added between Transects 2 & 3

- approximately 3,000 meter gap in the Nisqually Delta area

Unique station, high energy tidal currents, large woody debris, complex benthic habitat

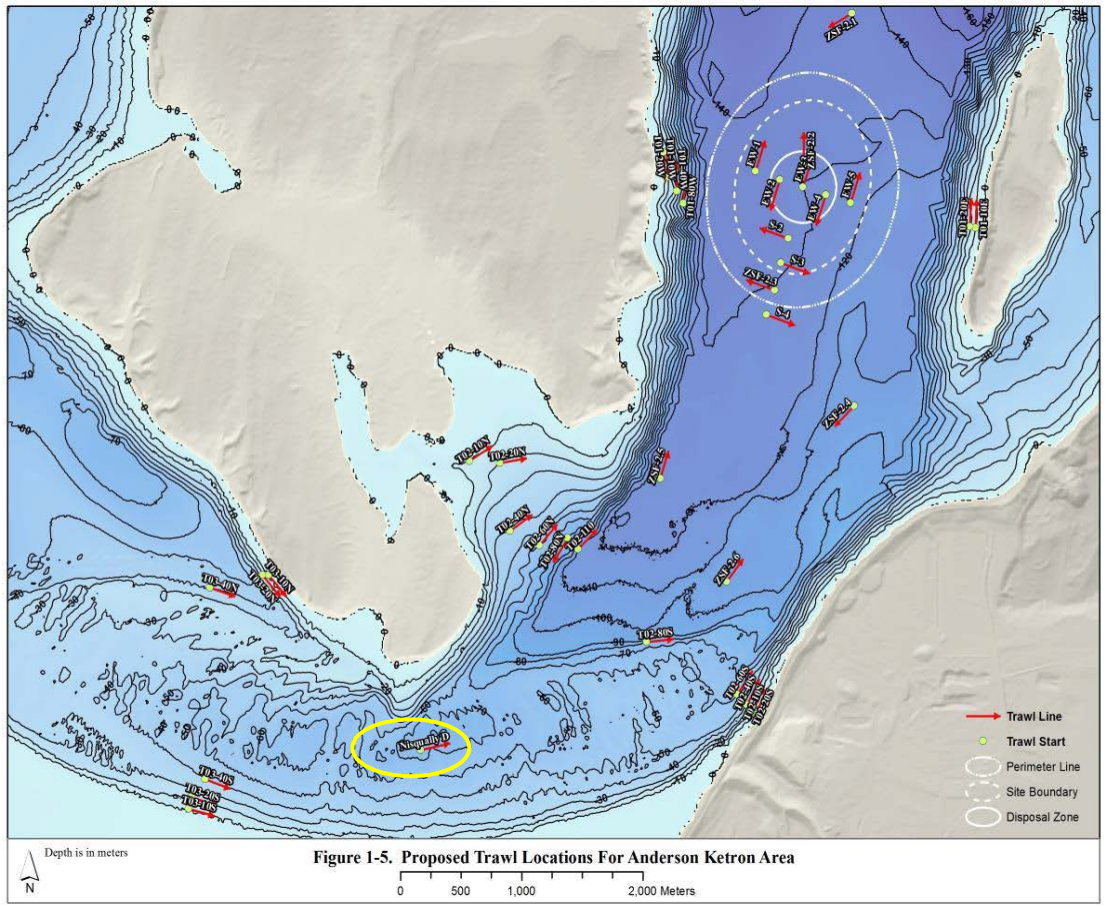

Figure 1-5. Proposed Trawl Locations For Anderson Ketron Area

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DISPOSAL SITE CENTER (EW-3)

Seasonal intervals
Surface and bottom water samples

- Niskin sampler
  - Temperature
  - Salinity
  - Dissolved oxygen

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WHAT TO EXPECT

Data report characterizing the existing demersal fish, crab, and shrimp resources

Comparison of these results to the 1987 study results where available and appropriate

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ANDERSON/KETRON WDFW'S ROV SURVEY

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Purpose

- Duplicate beam trawl stations as much as possible
- Compare results for future alternatives

WDFW Participated from early design of Corps Trawl project

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WDFW vessel, equipment, and staff

- Robert Pacunski, WDFW Marine Fish Science Unit
- Jennifer Blaine
- Jim Beam
- Analysis Technicians
- Don Rothaus, Shellfish Unit

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WHAT TO EXPECT NEXT

WDFW data compiled Summer 2015.

Compare to Corps trawl study.

Consider future applications of ROV.

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DNR DISPOSAL VOLUMES SHORELINE PERMIT UPDATE

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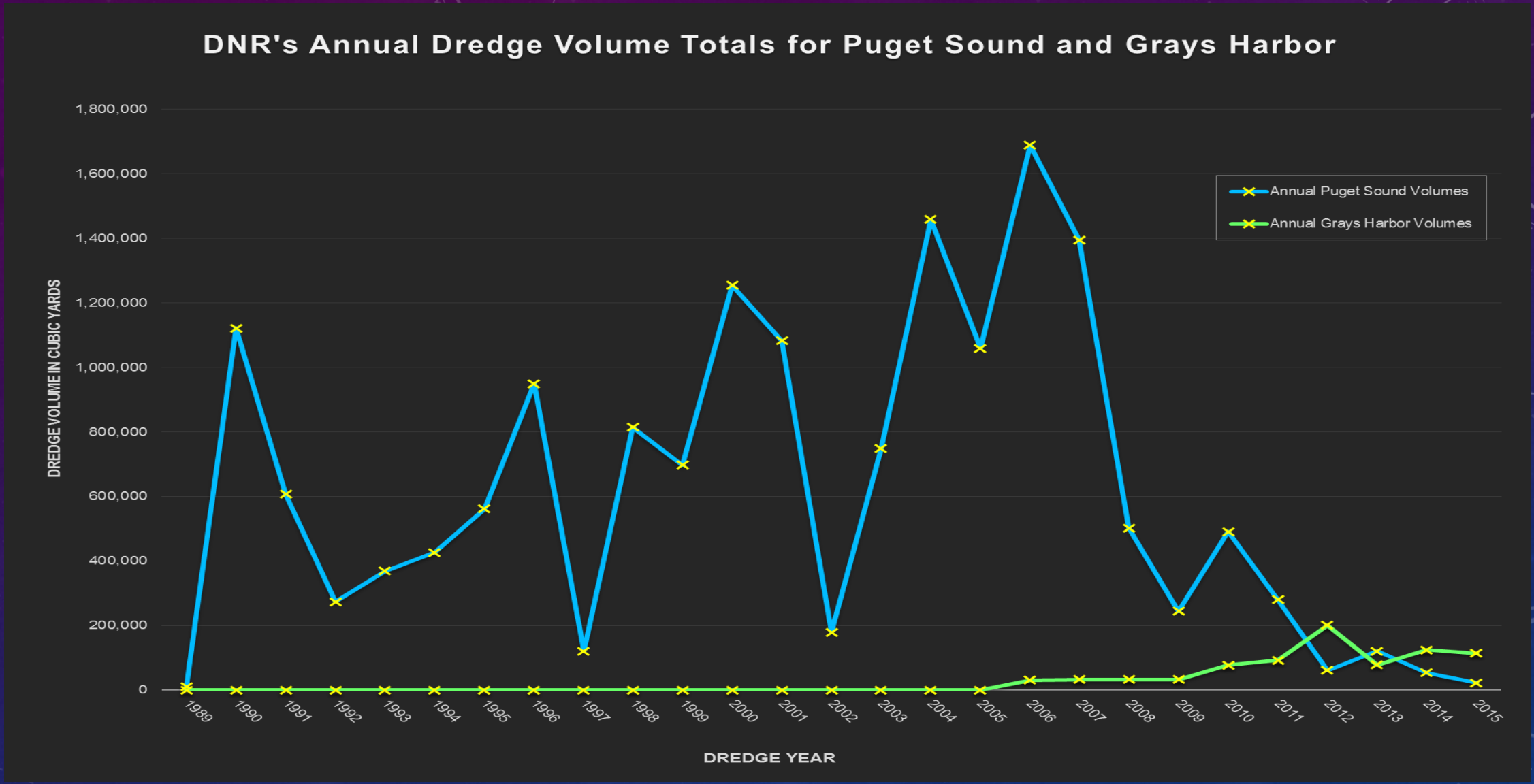

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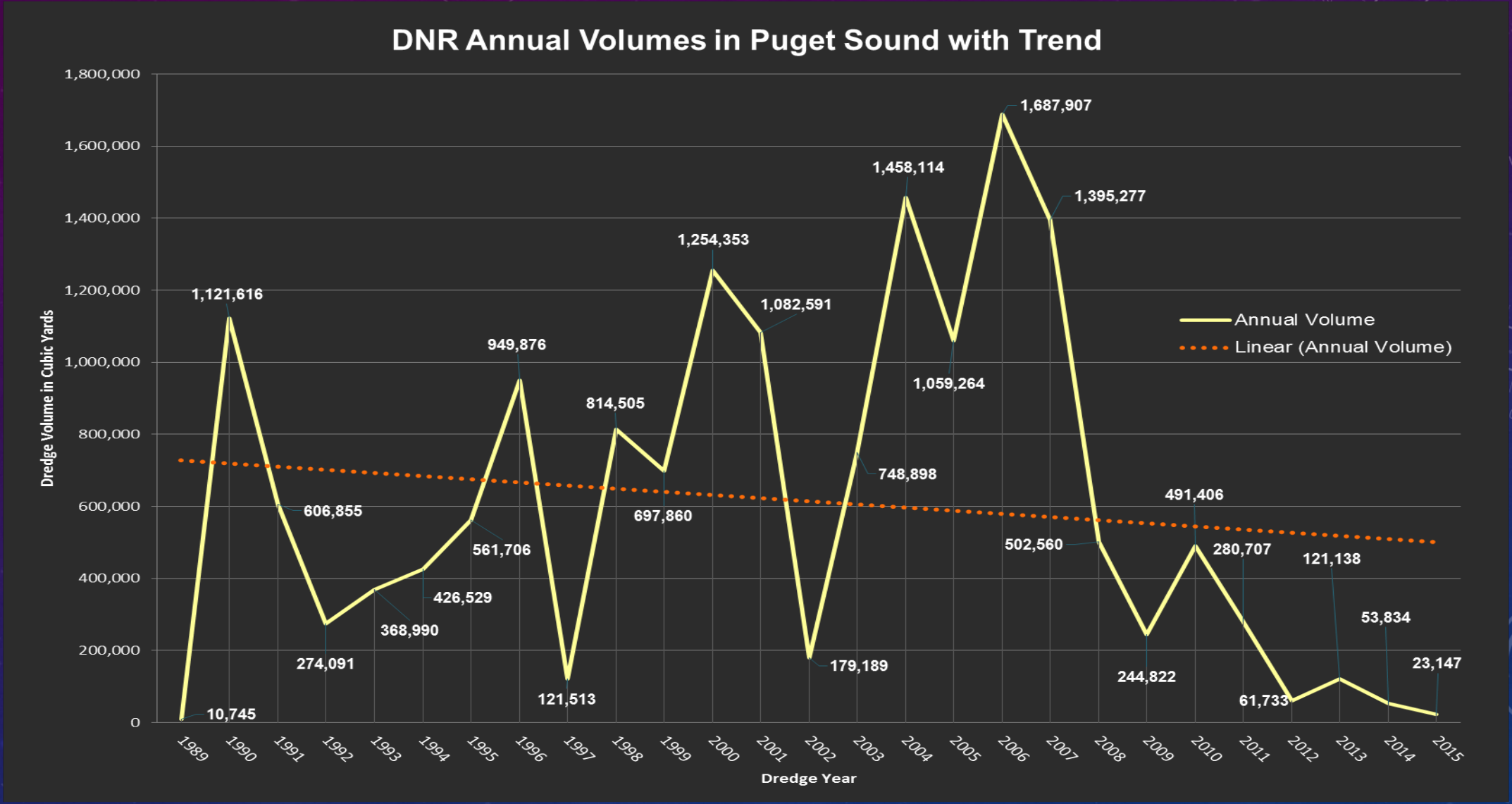

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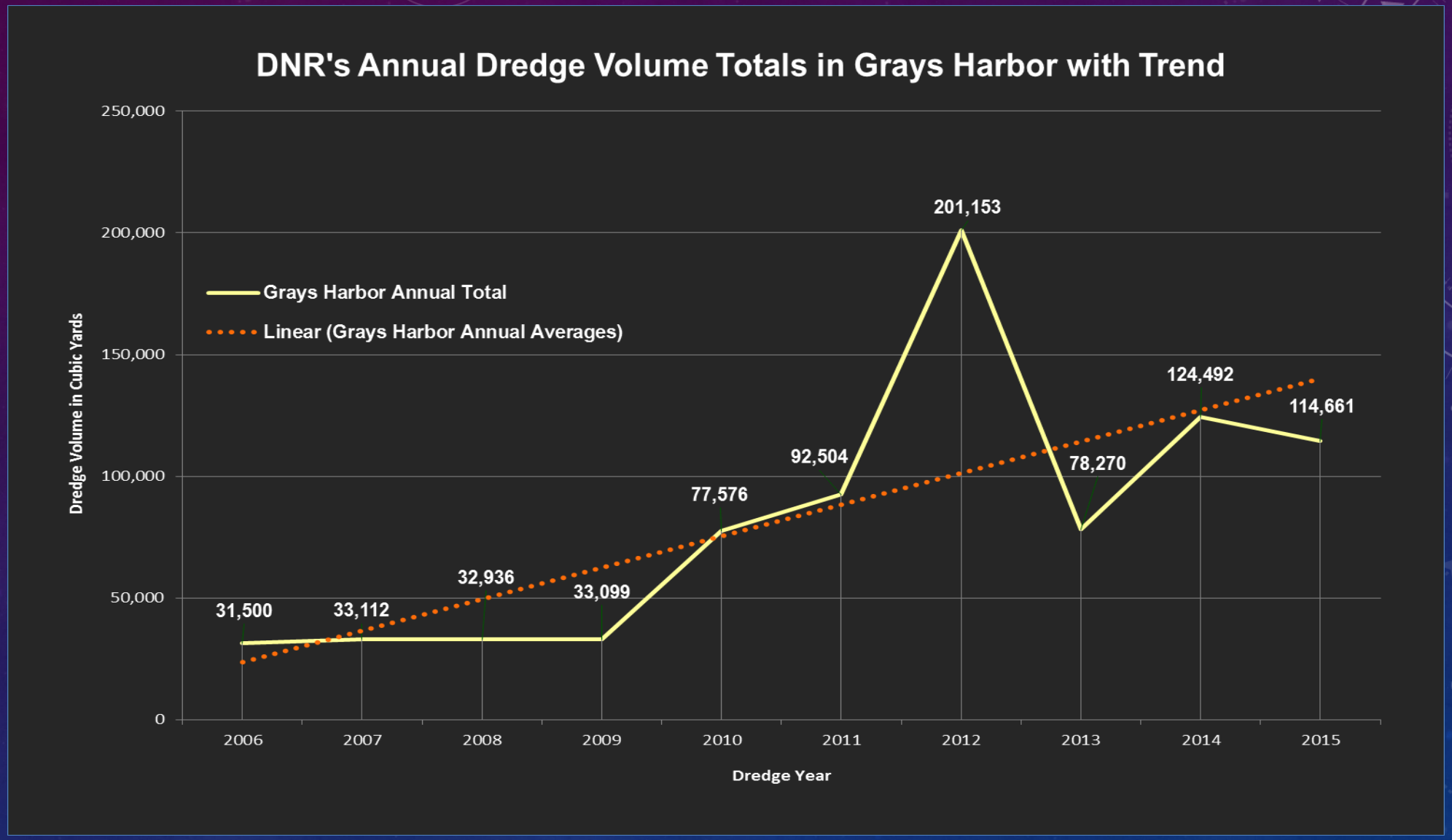

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Shoreline Permit Update

Disposal Site	Jurisdiction	Expiration date	Term	Permit Fee
Anderson/Ketron	Pierce Co	Sept 10, 2014	Application Pending study results & SMP modification	Expect $9,000 fee
Port Gardner	City of Everett	Dec 15, 2014 (1 x 5 yr ext possible)	Second extension requested	$2,000 (1999)
Commencement Bay	Pierce County	Sept 13, 2015	Extension requested	$2,205 (2009)
Willapa	Pacific Co	Jan 31, 2016	5 yr	$780 (2010)
Port Townsend	Clallam Co	Feb 2, 2016	5 yr (1 yr ext)	$1125 (2010)
Port Angeles	City of Port Angeles	May 24, 2016	5 yr	$750 (2010)
Grays Harbor	Grays Harbor Co	Dec 7, 2016 (1 x 5 yr ext possible)	10 yr (2x 5 yr ext)	$200 (2001)
Elliott Bay	City of Seattle	May 2, 2021	10 yr term	$3,311 (2010)
Rosario	Skagit Co	Sept 26, 2021	10 yr	$2,400 (2010)
Bellingham Bay	Whatcom Co	expired		$1,745 (2001)

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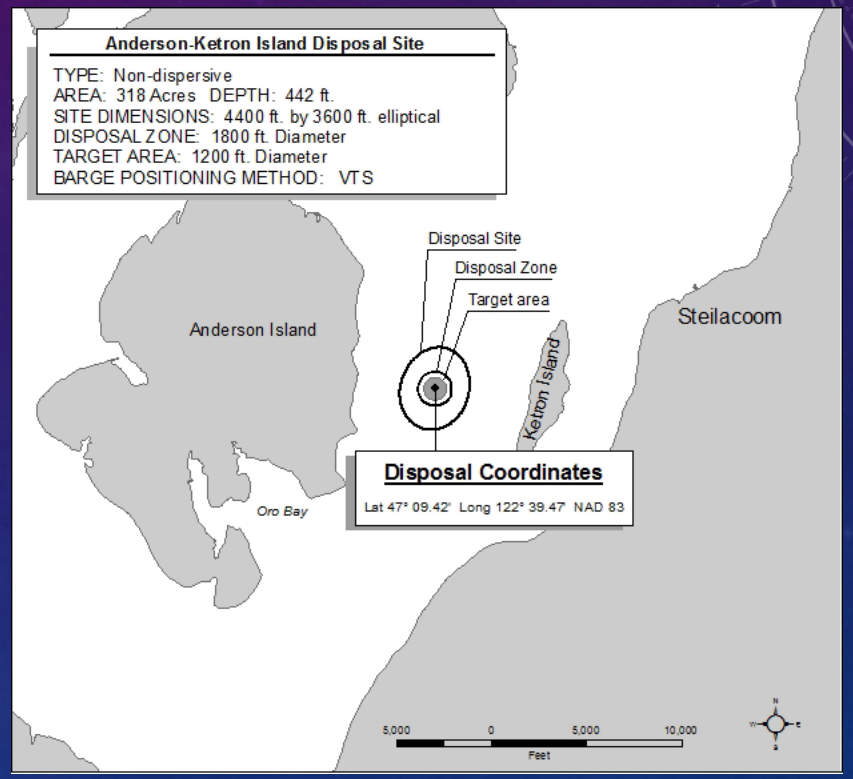
ANDERSON/KETRON DISPOSAL SITE

Anderson/Ketron Disposal site established in 1989

- 26 years of scientific monitoring
- Historically used on average – once every 3 years



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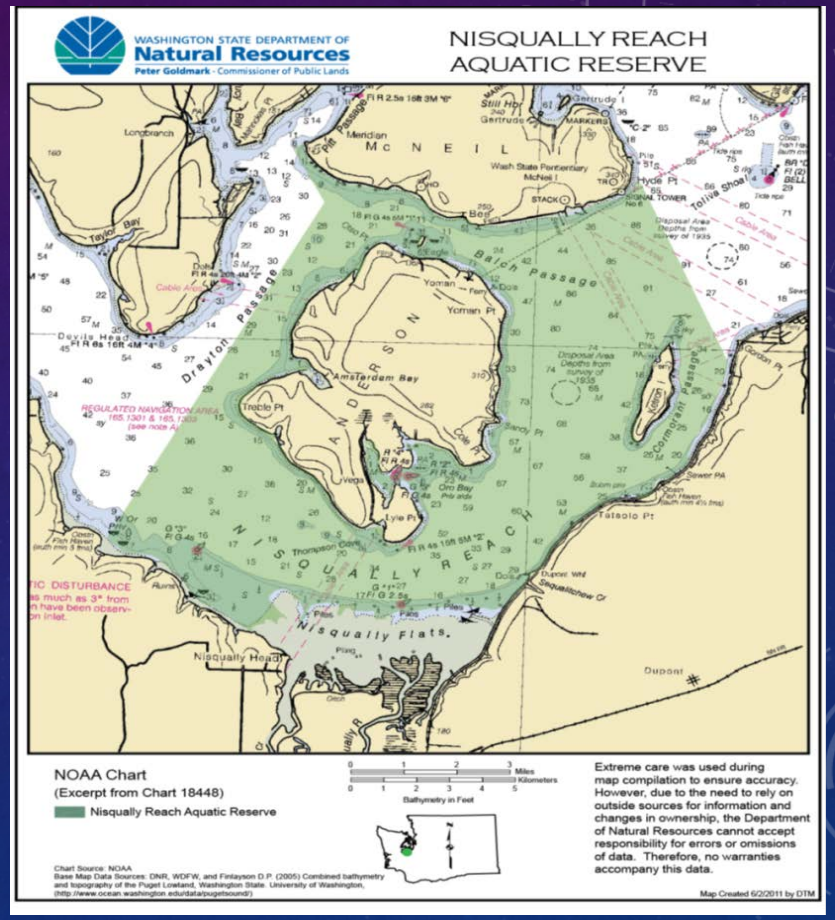
ANDERSON/KETRON DISPOSAL SITE

DNR established Nisqually Reserve in October 2011

- DNR will evaluate new uses within the Reserve
- Disposal site is an approved use in Reserve Management Plan



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Pierce County Shoreline Master Program

Shoreline Permits from local jurisdictions required for use of all disposal sites.

Proposed Pierce County Shoreline Master Program was written to allow for dredge disposal under DMMP.

However - late revision to proposed program – Page 30 of Exhibit G added:

1. The following activities **are prohibited**:
   d. Disposal of dredged material within the Nisqually Reach Aquatic Reserve.

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Public Comment Window

Ecology will review Pierce County Proposed Shoreline Master Program

Open for public comment early summer – around June?

Opportunity to submit comments to Ecology regarding this restriction on use of the Disposal Site

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Contact Washington Department of Ecology

Get on the list to receive notice of opportunity to comment

Kim VanZwalenburg
kvan461@ECY.WA.GOV
(360) 407-6520

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QUESTIONS?

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