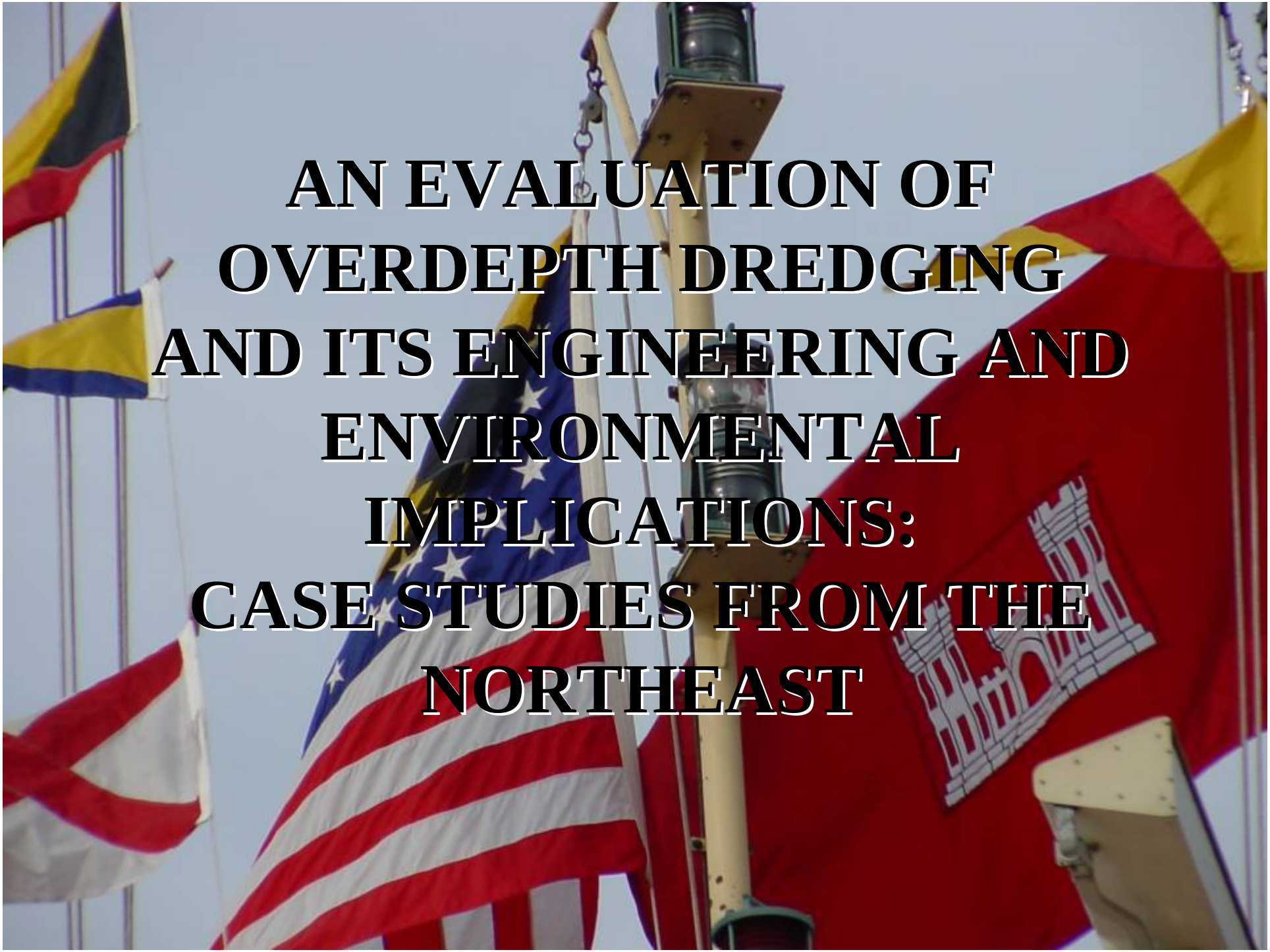

AN EVALUATION OF OVERDEPTH DREDGING AND ITS ENGINEERING AND ENVIRONMENTAL IMPLICATIONS: CASE STUDIES FROM THE NORTHEAST

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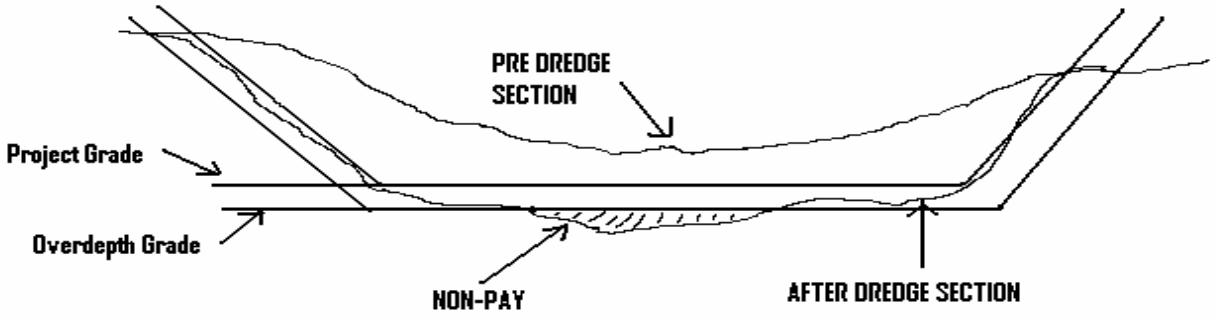
Definitions



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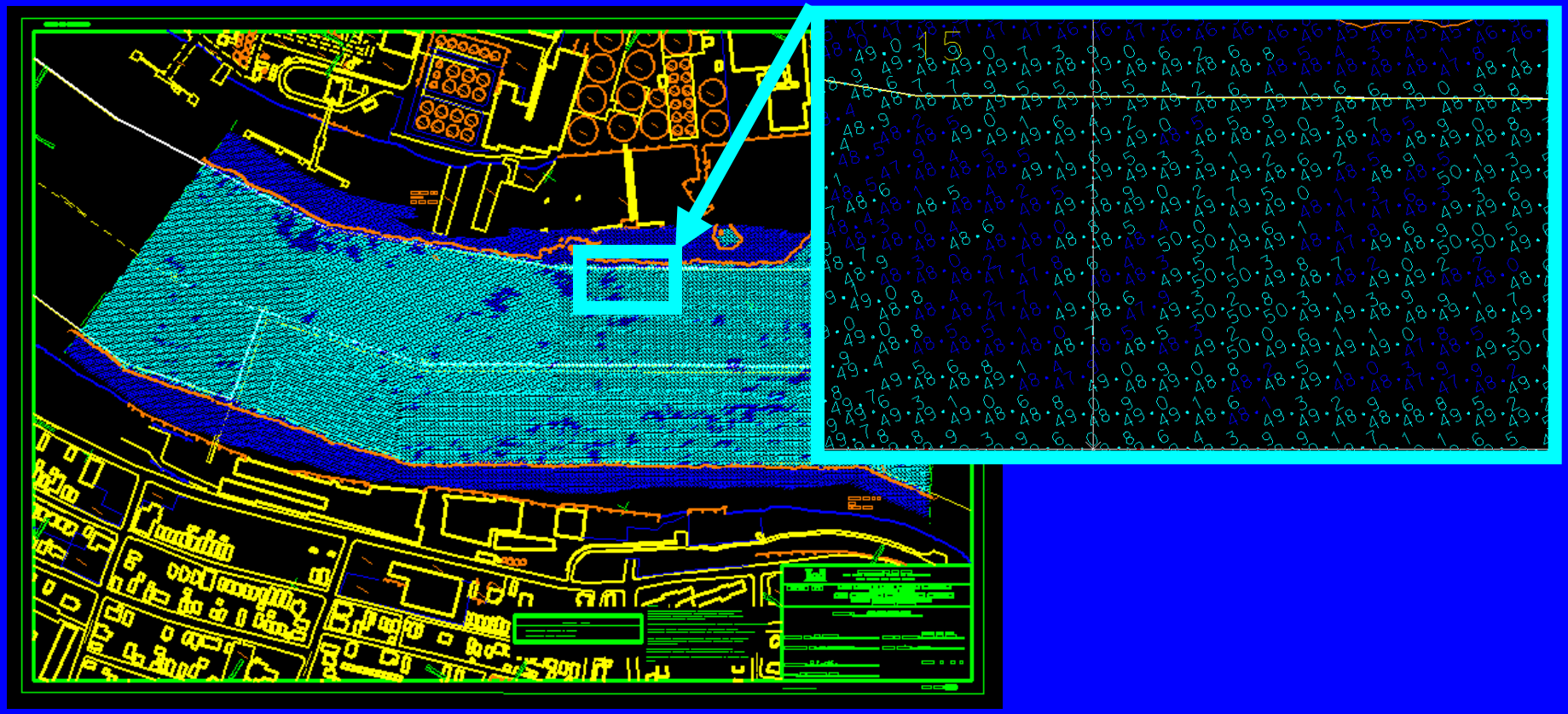
How to Evaluate Overdepth?

- Surveys can be overwhelming



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How to Evaluate Overdepth?

- To look at the “deepest” point is not meaningful
- Would a statistical approach be informative?

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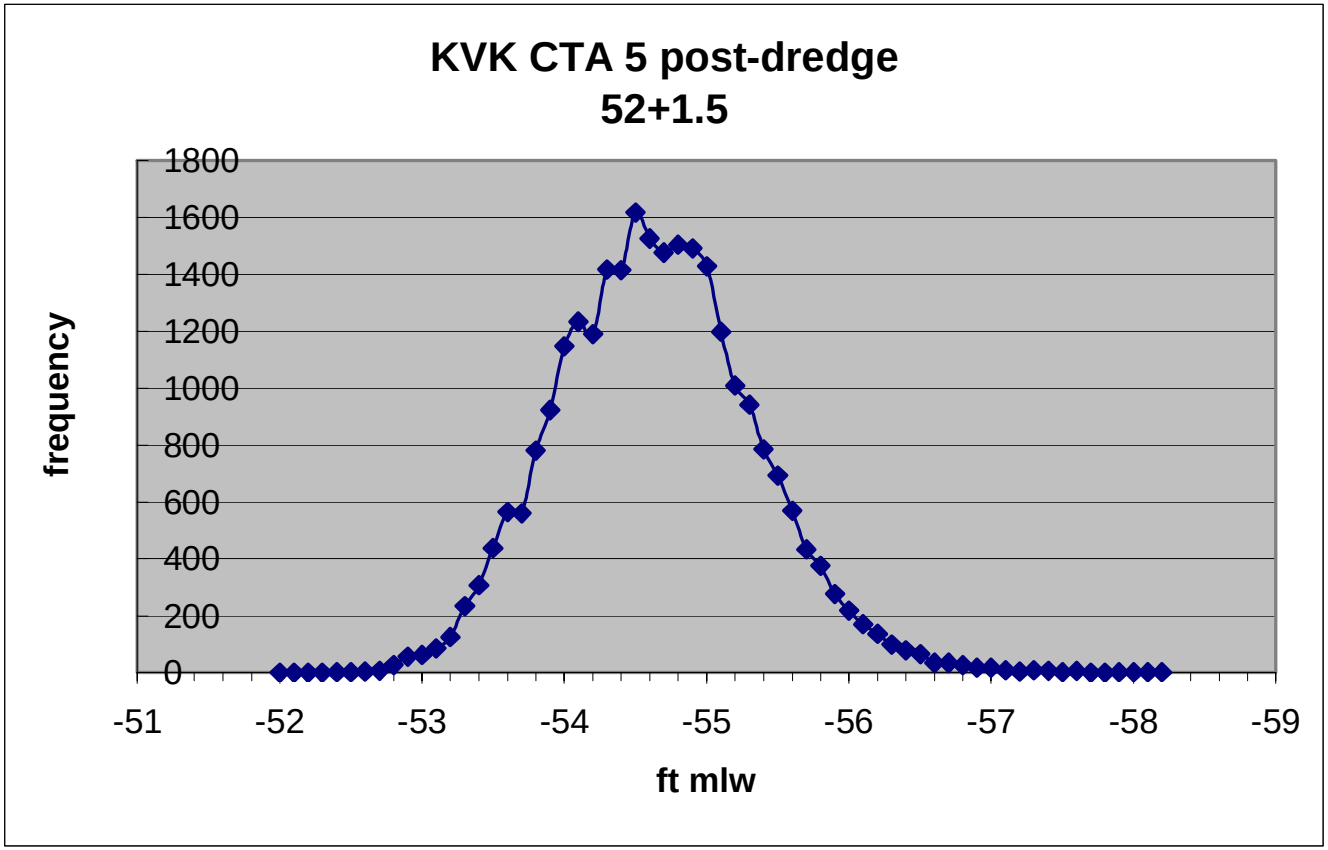
A Statistical Approach

SD	0.69
Avg	-54.6
Median	-54.6
Mode	-54.5
Max	-58.2
Material	Rock/Till
Typ Dredge	13 CY exc



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Today's Program

- Is overdepth predictable?
- Factors that influence overdepth dredging
- Selected Projects
- Results

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Is Overdepth Predictable?

If overdepth is predictable we can better manage the expectations of the Corps, industry and stakeholders.

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Factors That Influence Overdepth

- Environment
- Specifications
- Equipment
- Material type

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Factors That Influence Overdepth

- Environment
  - Working underwater
  - Tide
  - Waves
- Specifications
  - Does the amount of allowable overdepth influence total overdepth?

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Selected Projects

We chose projects that represented a wide variety of these variables.

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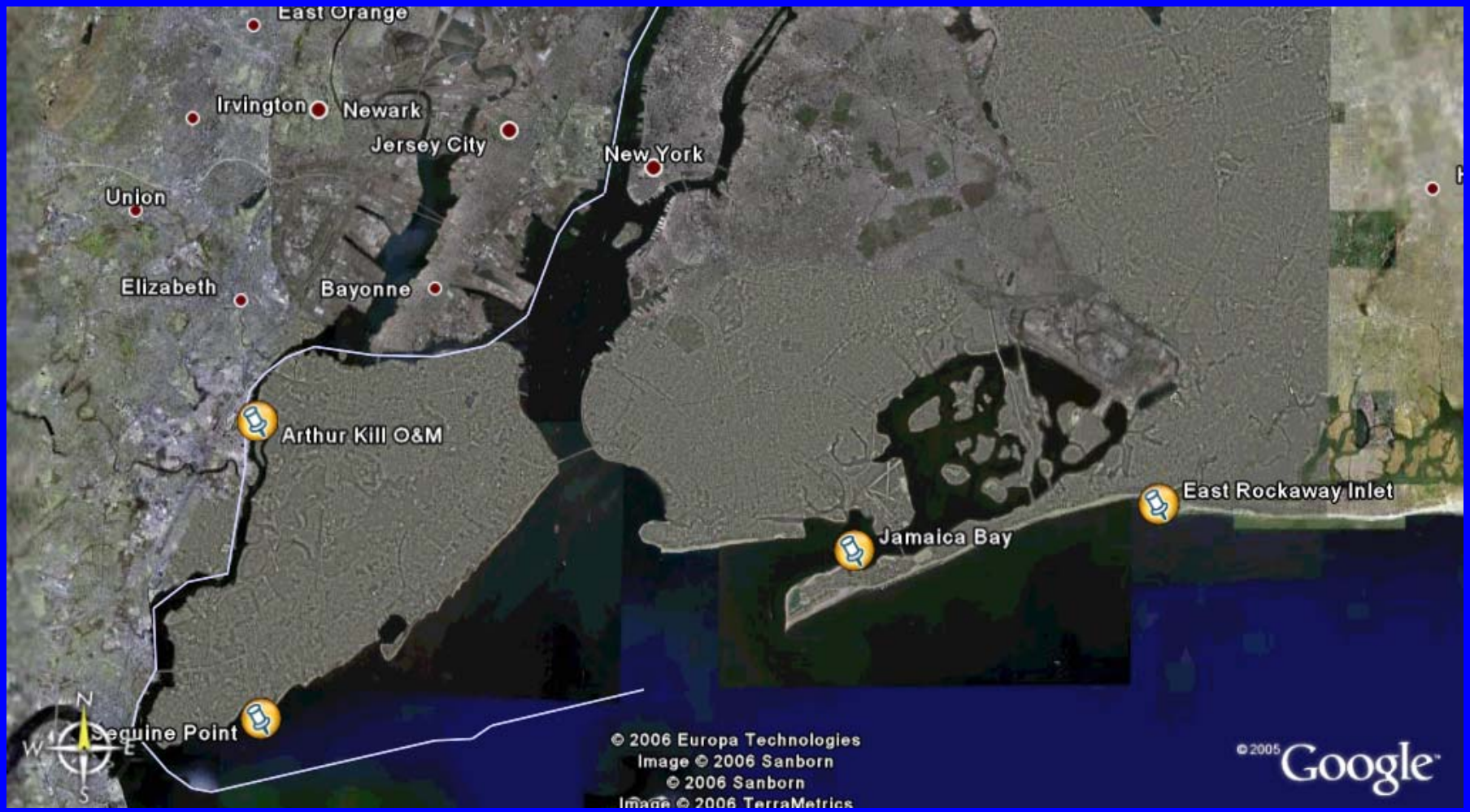
Maintenance Dredging



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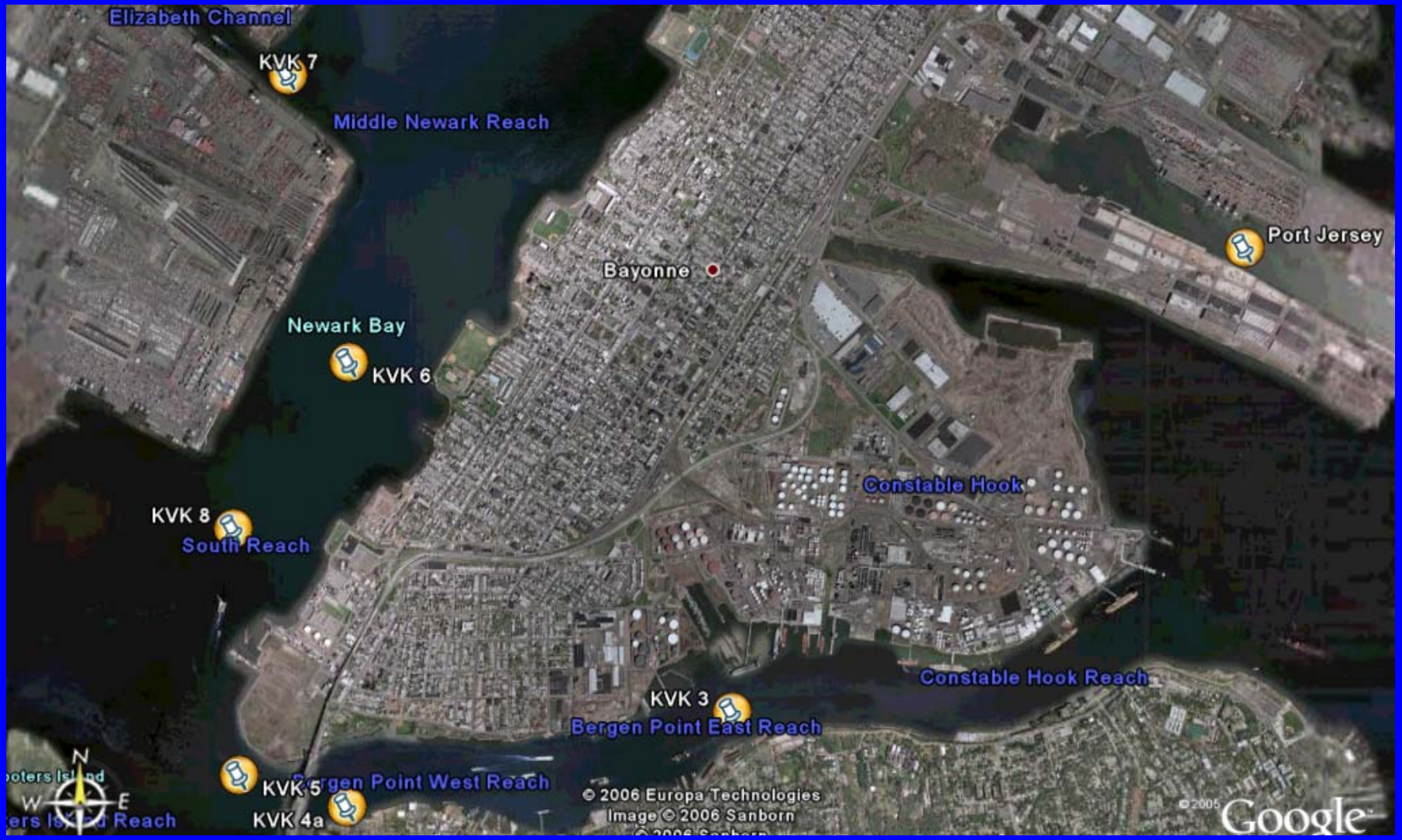
New Work Dredging



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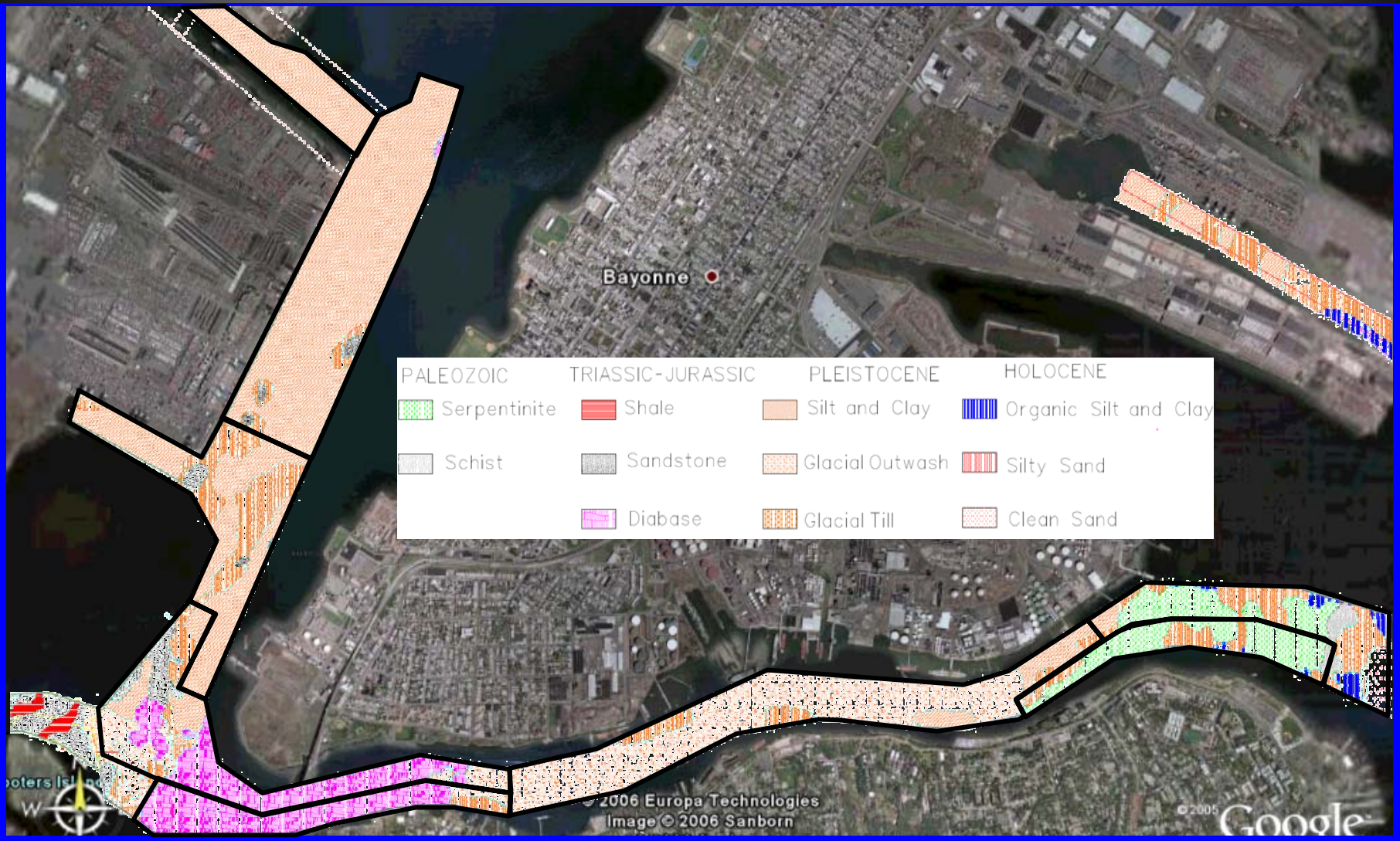
New Work Dredging



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Selected Projects

Project Title	Maintenance or New Work	Predominant Material	Typical Dredge	Allowable Overdepth (ft.)
Kill van Kull Area 3	New Work	till	backhoe	1.5
Kill van Kull Area 4a	New Work	rock	clamshell	0.0
Kill van Kull Area 5	New Work	rock	backhoe	1.5
Kill van Kull Area 6	New Work	clay	backhoe	1.5
Kill van Kull Area 7	New Work	clay	clamshell	0.0
Kill van Kull Area 8	New Work	clay	backhoe	1.5
Port Jersey Area 1	New Work	till	clamshell	1.5
Arthur Kill 2005	Maintenance	silt	clamshell	2.0
Seguine Point 2004	Maintenance	silt	clamshell	2.0
Jamaica Bay 2004	Maintenance	sand	hopper	2.0
East Rockaway 2005	Maintenance	sand	hopper	2.0

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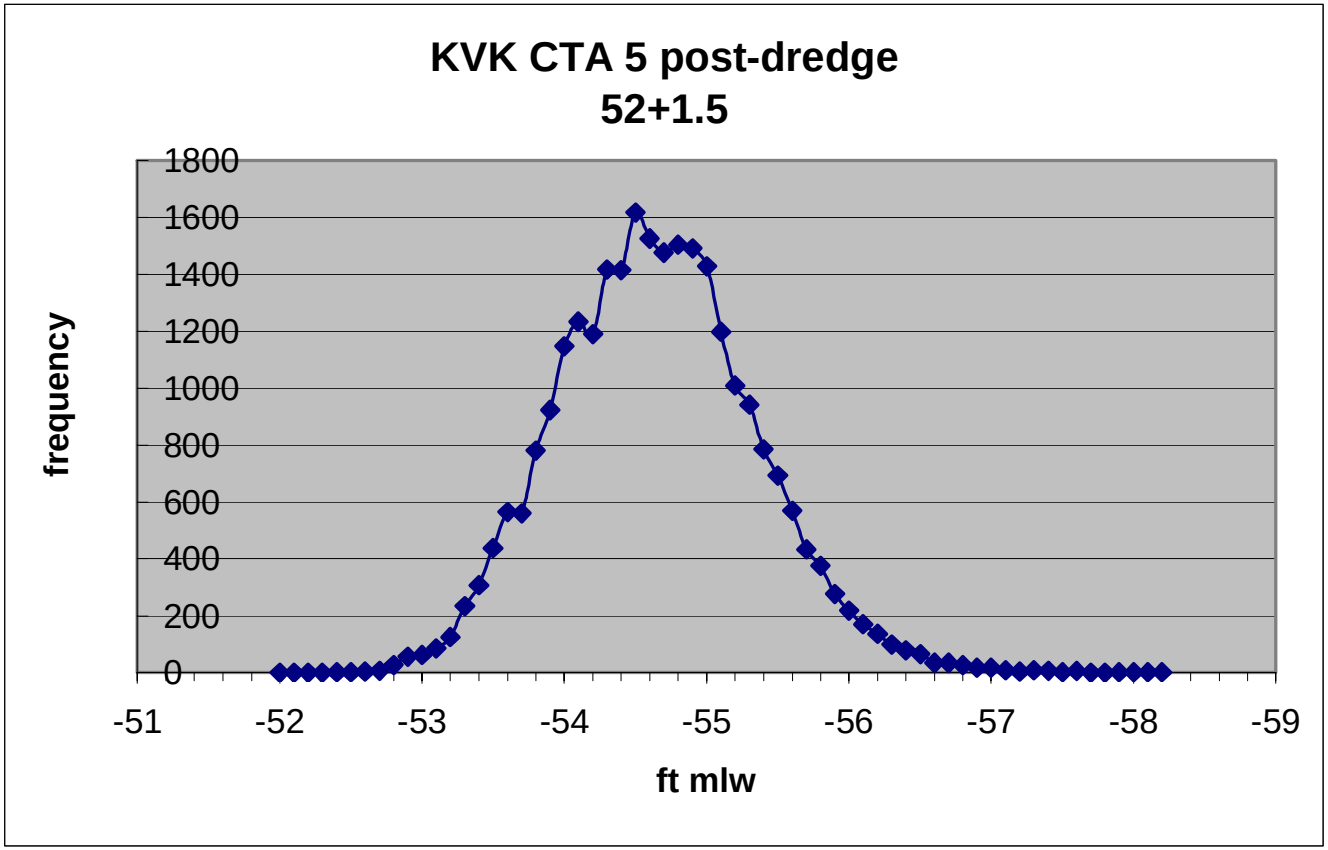
Results

SD	0.69
Avg	-54.6
Median	-54.6
Mode	-54.5
Max	-58.2
Material	Rock/Till
Typ Dredge	13 CY exc



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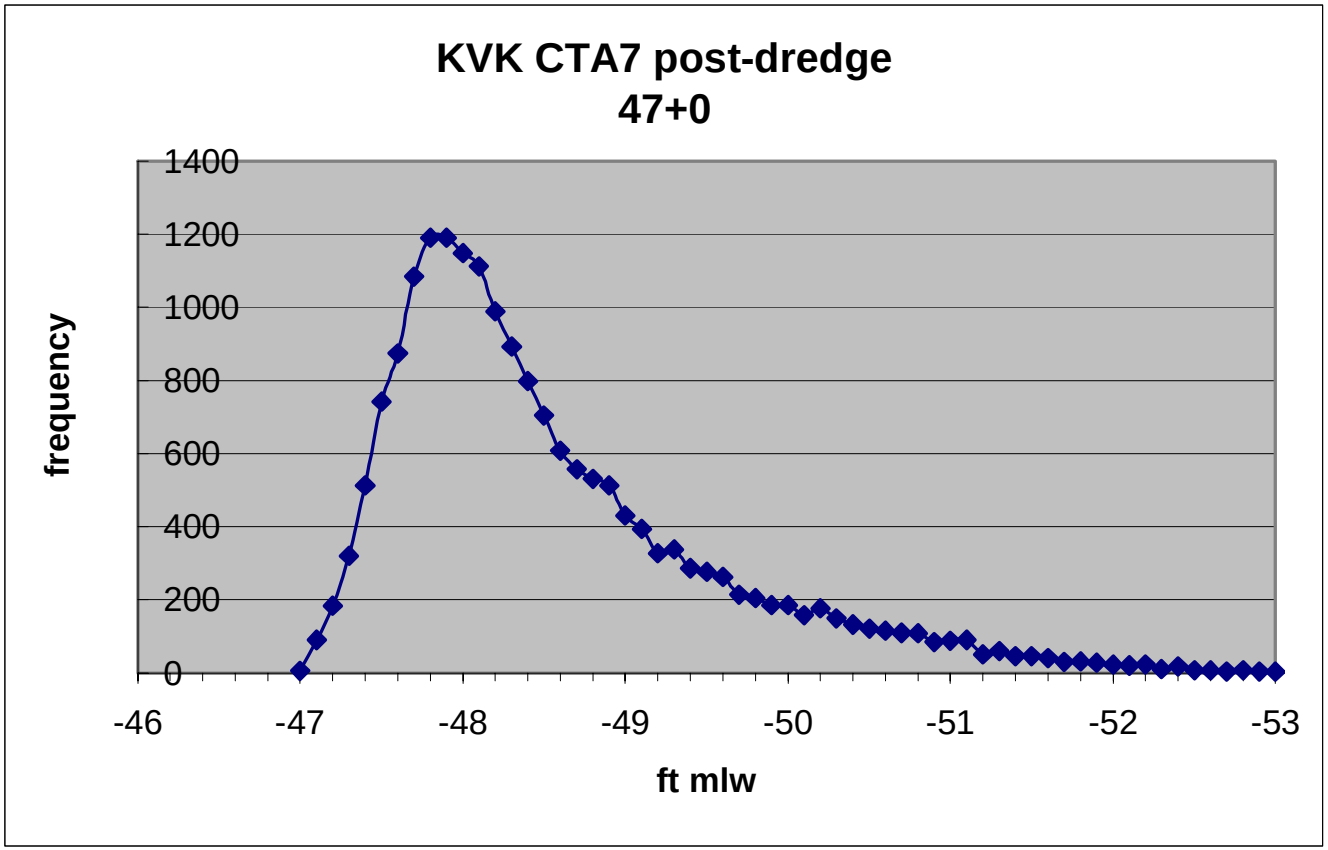
Results

SD	1.01
Avg	-48.5
Median	-48.2
Mode	-47.8
Max	-54.3
Material	Mostly Clay
	Some rock
Typ Dredge	8 Cy clam



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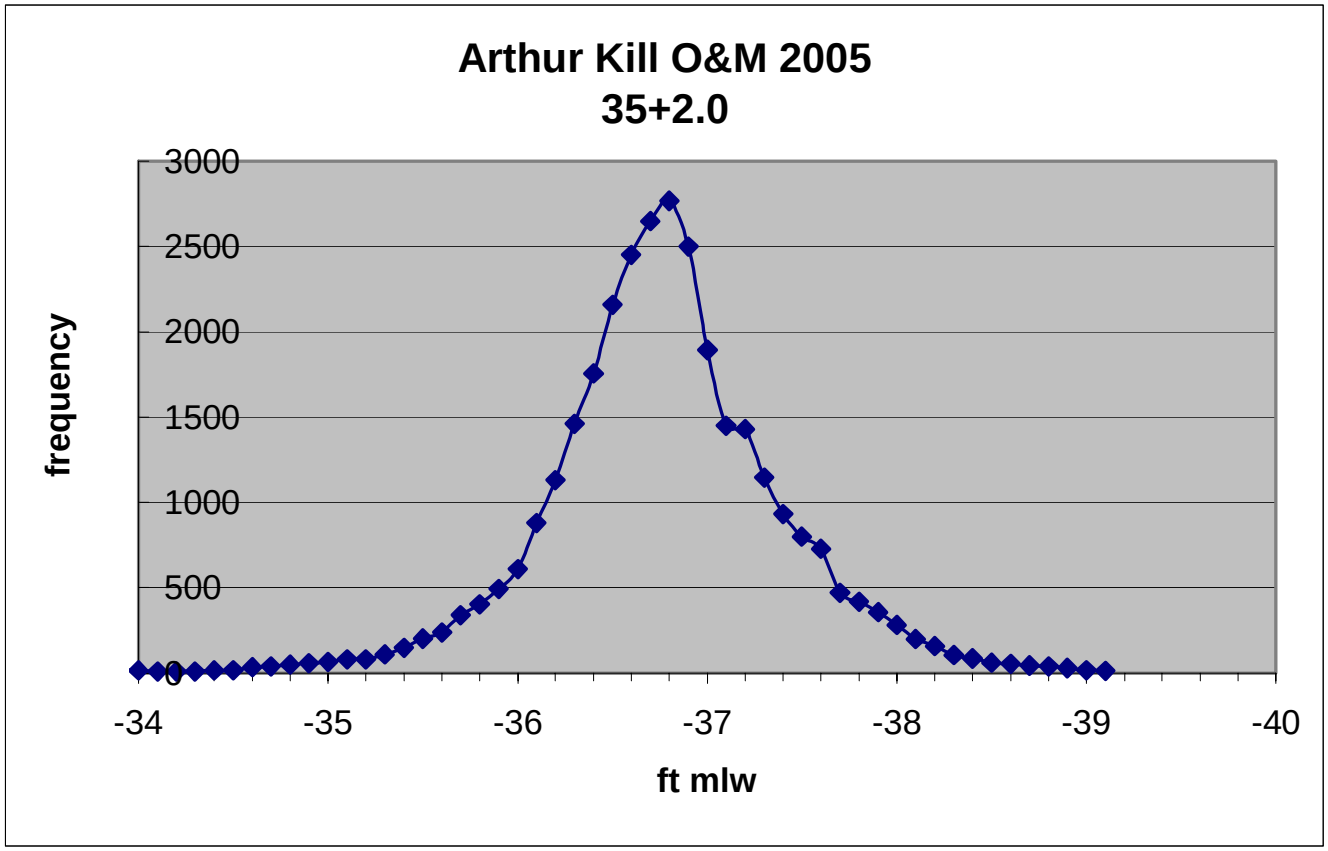
Results

SD	0.75
Avg	-36.7
Median	-36.8
Mode	-36.8
Max	-39.8
Material	O&M
Typ Dredge	Clamshell



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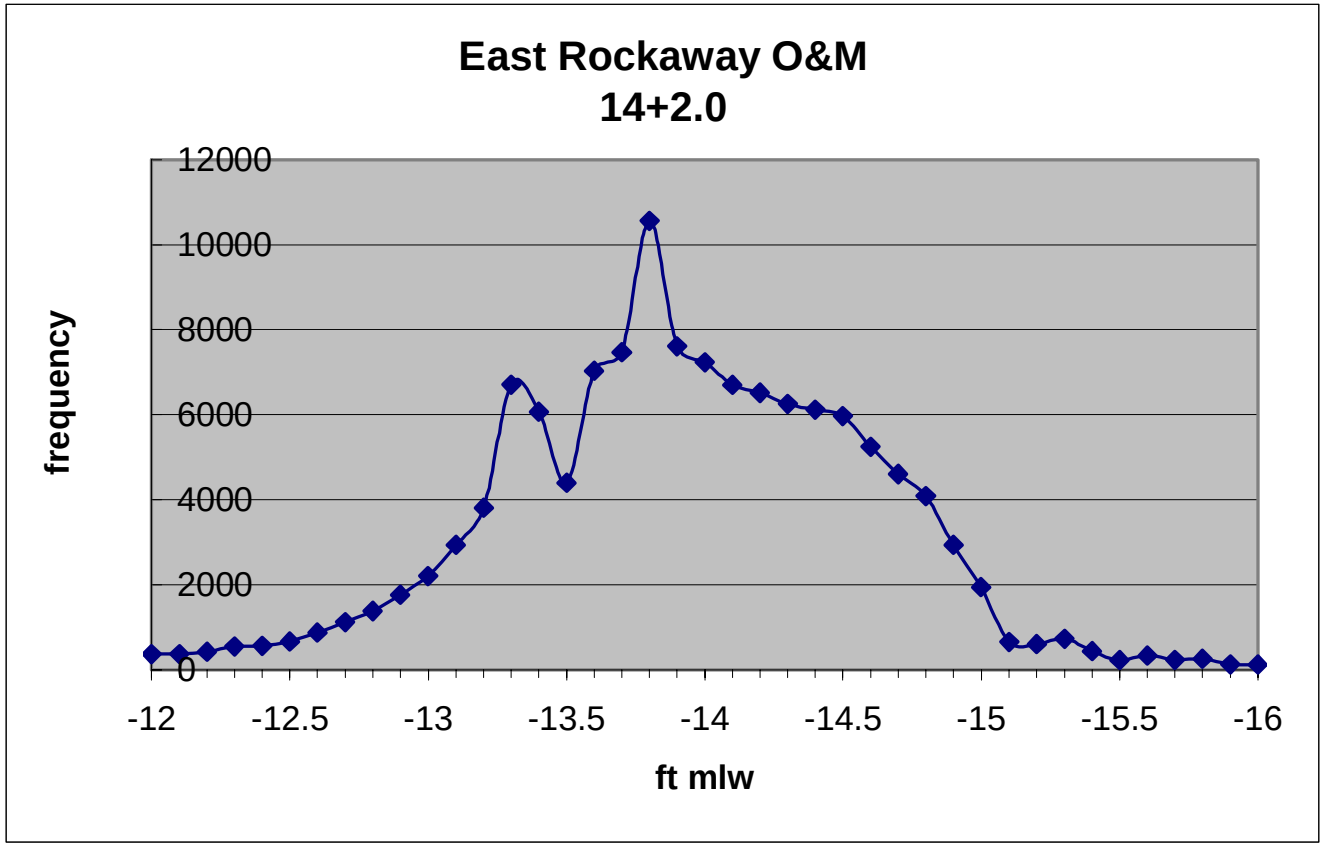
Results

SD		1.10
Avg		-13.9
Median		-13.9
Mode		-13.8
Max		-18.0
Material	O&M	
Typ Dredge	Hopper	



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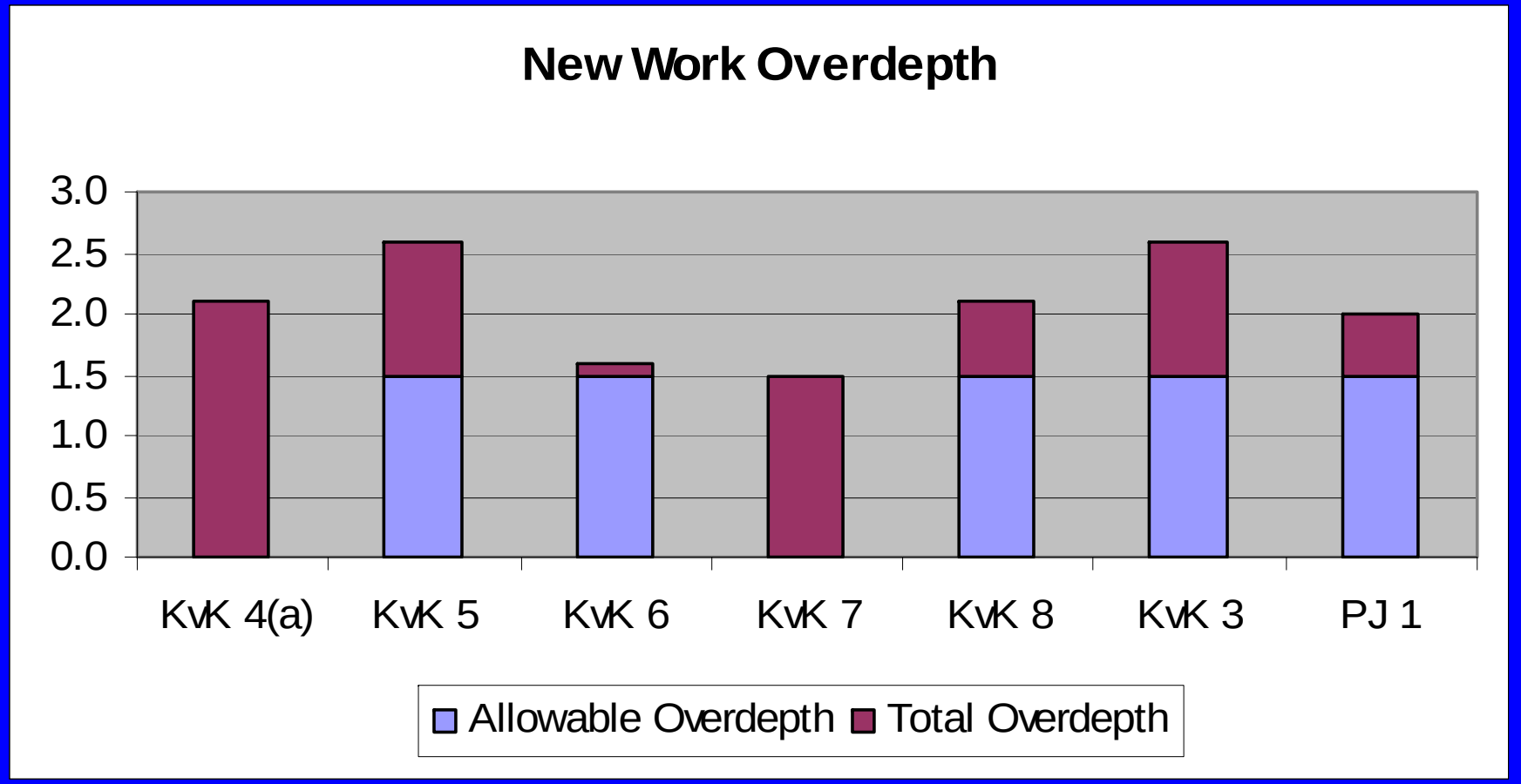
Results



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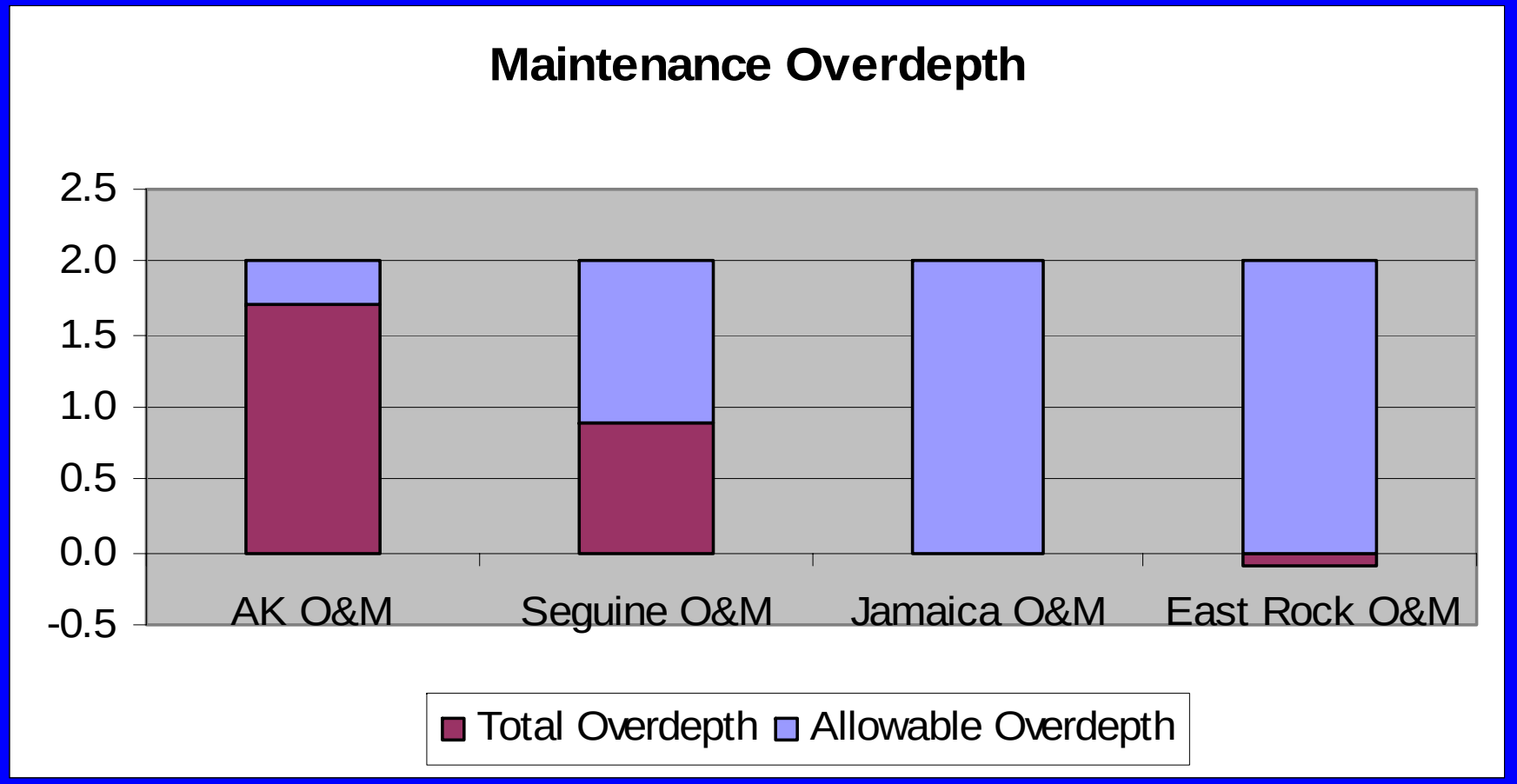
Results



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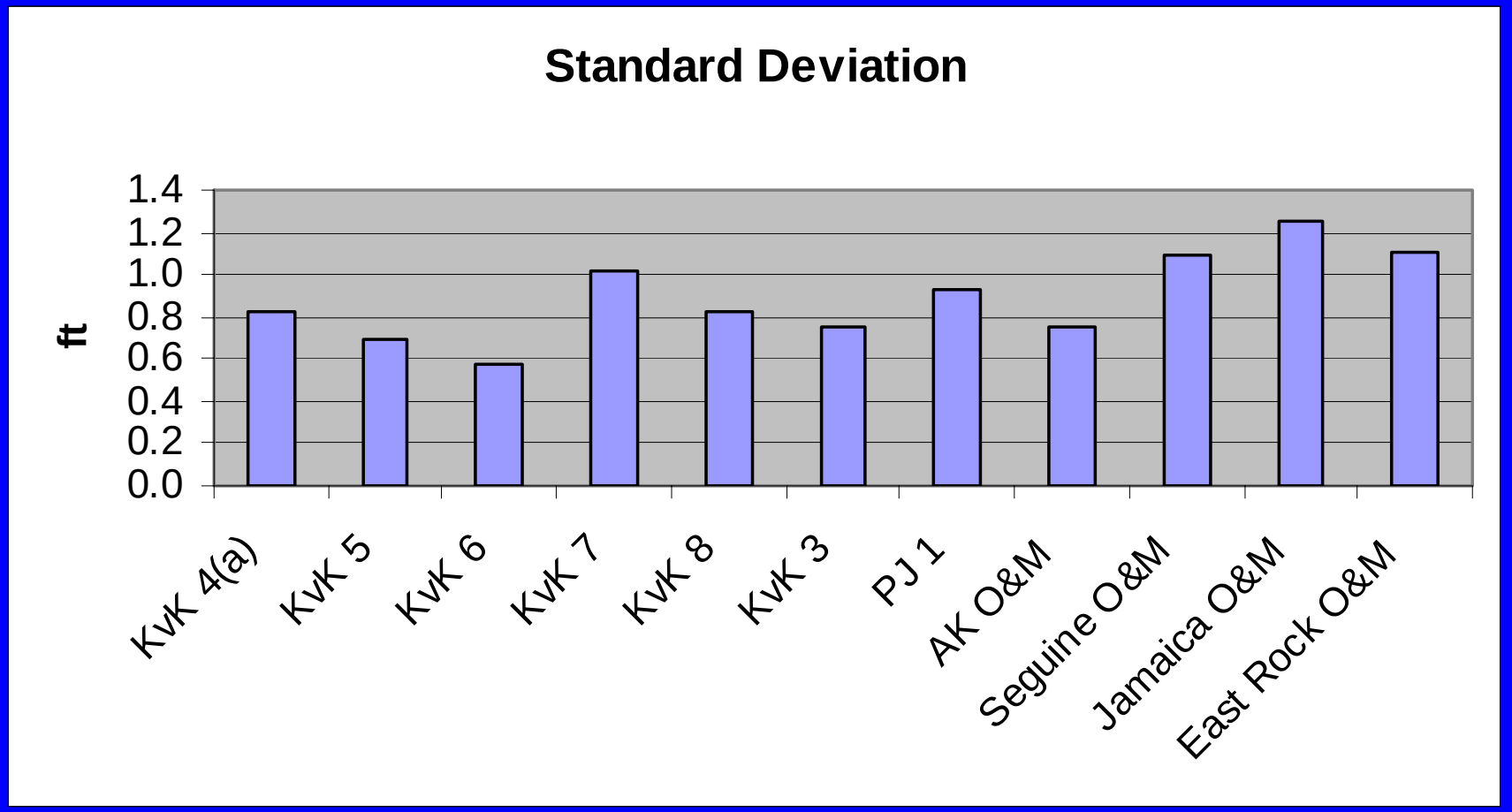
Results



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Conclusions and Recommendations

- Overdepth *is* predictable
  - Typically new work non-pay overdepth was an average of 1-2ft
  - Typically maintenance overdepth was within the allowable overdepth.
  - Non-pay overdepth volumes were 11.3% to 14.5% for new work and –14.3% to 6.7% for maintenance. This is within the typical dredge estimating accuracy.

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Conclusions and Recommendations

- The pay and non-pay overdepth should be considered in design, estimating, environmental documents and sediment characterization.
- More information is required before other conclusions can be drawn