

maps, sections, and volumes of the material you want to remove
 precise locations of obstacles you need to avoid

e4 can map and quantify materials and obstructions in your dredge template. Our measurements are crucial to our clients' ability to plan, design, build, and monitor dredging activities most efficiently. e4 combines geotechnical and geophysical data to deliver the most comprehensive and accurate characterization of a dredge template.

- Remote measurements fill in the gaps between borings and identify changes in subsurface geology. This means less guesswork and a clearer picture of what lies below the surface. Volume estimates computed by e4 are routinely within 10% of actual dredge spoil.
- Remote measurements are faster and less expensive and cover more area than comprehensive boring programs. Because data density is greater, obstructions and hazards are more likely to be identified.
- e4's proprietary data processing allows us to remotely measure compressional velocities of materials. These measurements can be correlated to the rippability of rock.
- e4's geophysical data was instrumental to the New York Harbor Deepening 50ft Project. Our data allowed project owners to accurately forecast project cost, and provided dredgers an accurate estimate of material volumes and presence of obstructions.
- Geophysical mapping yields high resolution maps of existing conditions quickly. Regulators trust e4's measurements of material separation status, which minimizes delays between different phases of harbor dredging.
- Results like target maps, surface maps, isopach maps, and difference maps can be exported into Auto CAD and GIS software and integrated into design and construction software. Data is only as valuable as its utility to the decision makers and site operators.

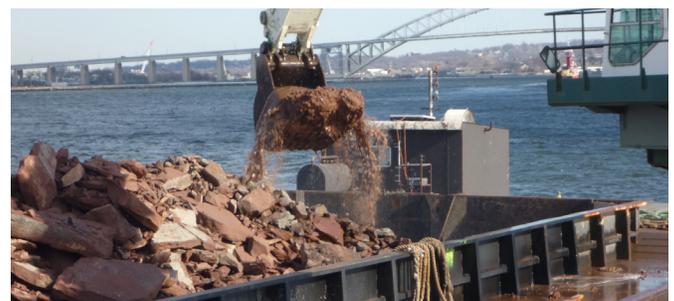
e4 results put you in control

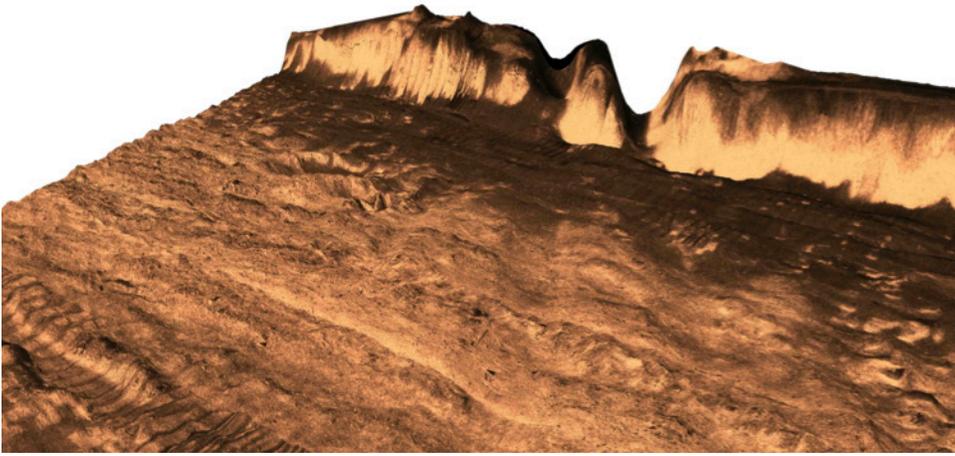
- Map stratigraphy in high definition
- Identify and quantify contaminated sediments
- Remotely measure compressional velocity of rock as a function of rippability.
- Quantify volumes of contaminated sediments, clean sediments, and rock.
- Locate, map, and assess condition of marine structures
- Locate and map existing utilities and infrastructure
- Locate and map subsurface obstructions
- Locate and map geohazards
- Monitor blast vibrations
- Monitor debris removal
- Monitor material separation



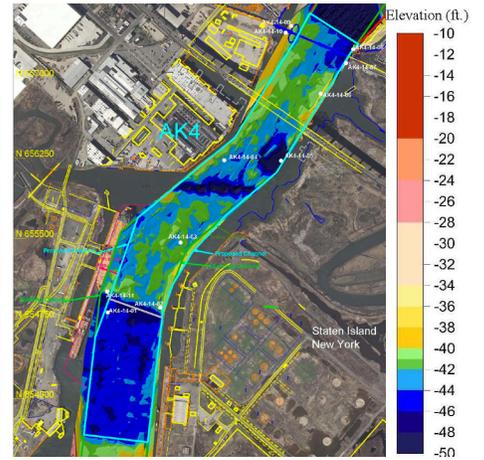
measurements

- Three dimensional imaging of docks and piers under water
- Bathymetry
- Side scan orthosonography
- Magnetic field mapping
- Seismic profiling
- SPT borings and rock cores
- Geotechnical and environmental sampling and testing
- Geologic cross sections
- Vibration monitoring

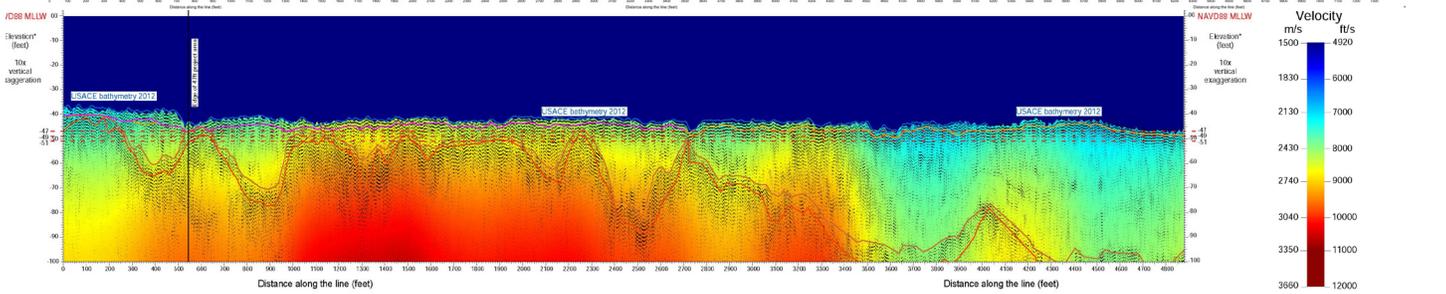
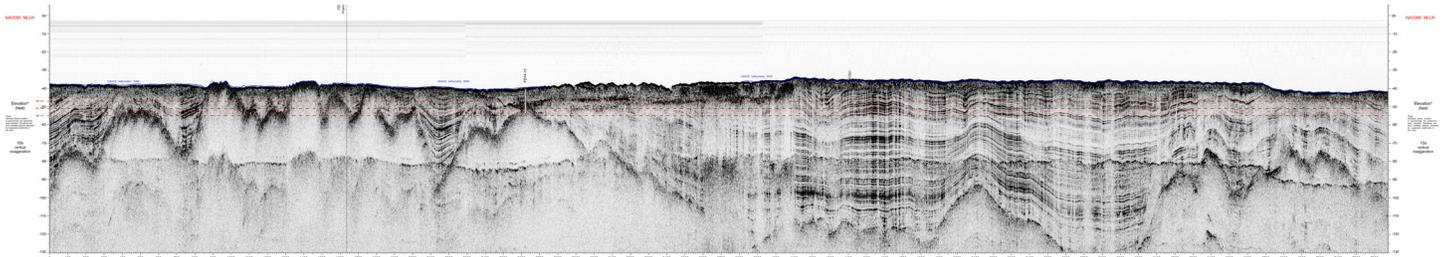




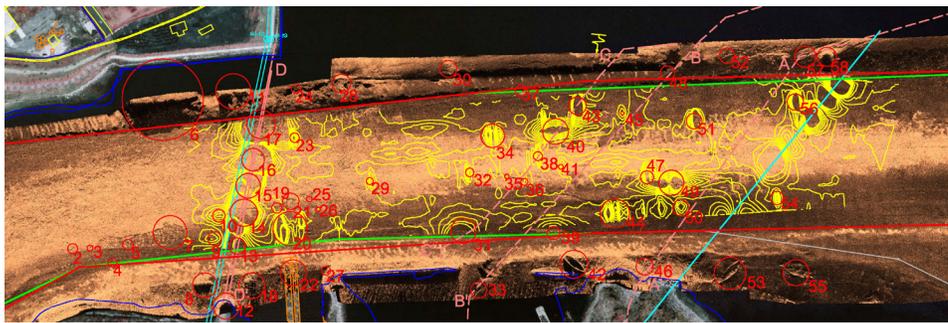
3-D sidescan mosaic showing accumulation of soft sediments at channel toe.



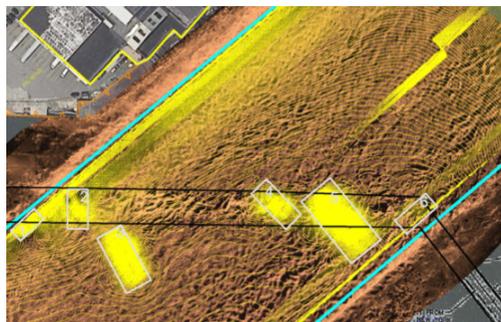
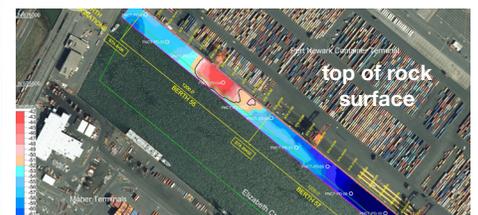
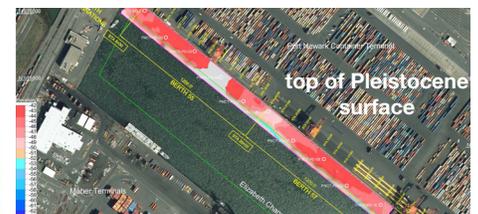
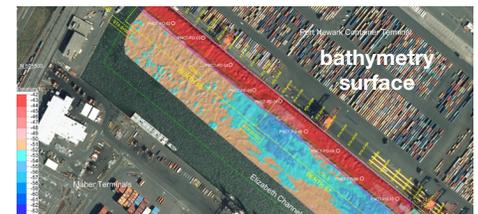
Top of rock elevation map



Reflection seismic profile (top) and seismic velocity map (bottom) characterize the elevation and rippability of rock.



Magnetic field map identifying previously unknown utilities in a dredge area.



Pipe-removal operations (left) in a federal navigation channel based on e4 mag (right) and seismic data (not pictured).

Surface maps of major units to be dredged.