CHESAPEAKE BAY COAL ASH RESOURCES

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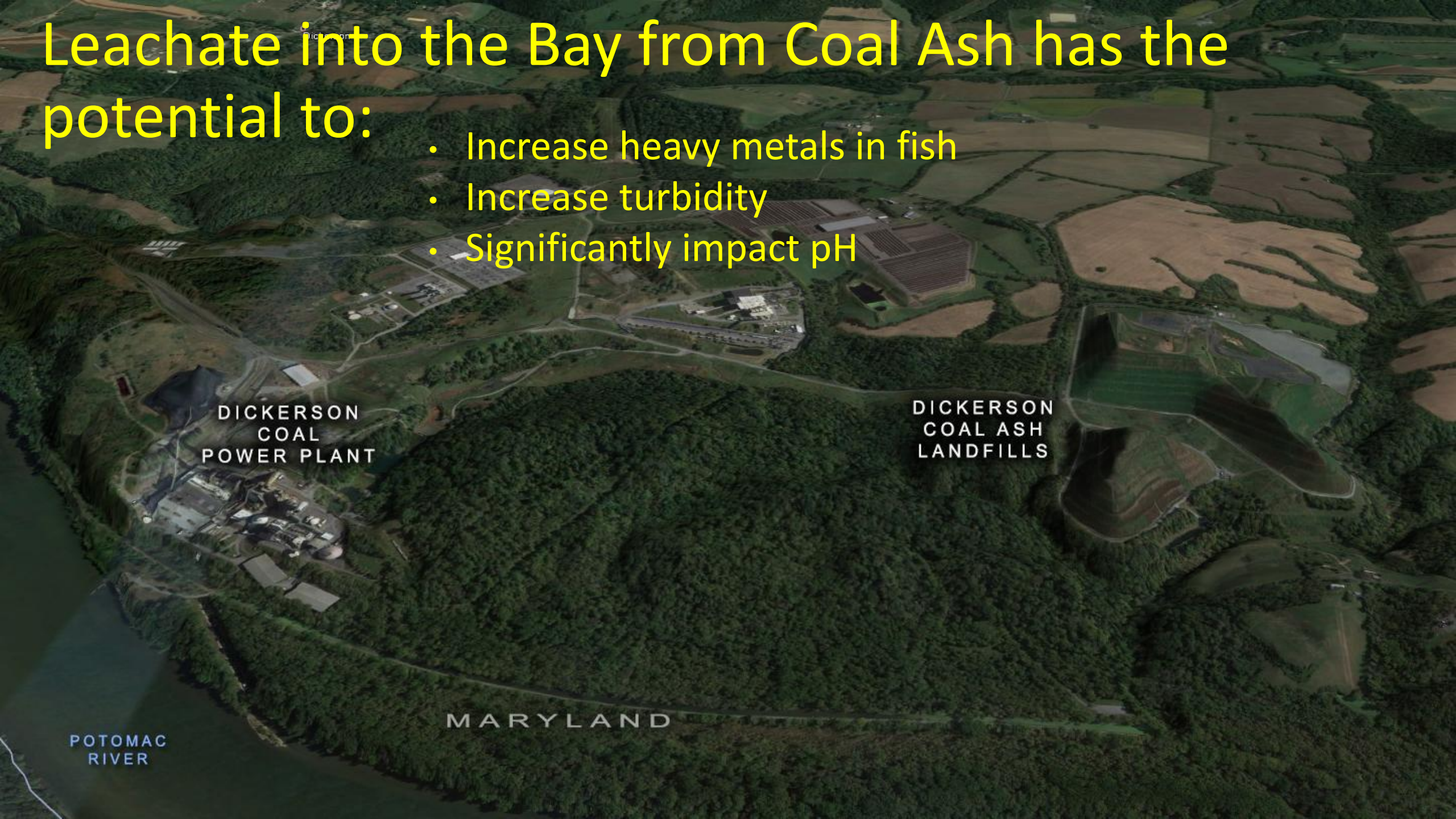
PROBLEM:

- Coal ash contains heavy metals: arsenic, chromium, lead, and mercury
- 68 identified coal ash sites in Maryland
- 696,000 tons of ash removed in Maryland in 2023.
- Over 9,500 acres are currently impacted by past mining practices in Maryland
- Historically, 100 coal-fired power plants in the Chesapeake Bay watershed left behind ~700 million tons of ash.

The Brandywine Ash Deposit in Maryland is considered by environmental groups to be among the ten worst ash disposal sites in the United States.

Leachate into the Bay from Coal Ash has the potential to:

- Increase heavy metals in fish
- Increase turbidity
- Significantly impact pH



Brandywine Ash Site: 7 million cubic yards of Ash

300 acres

Westland Ash Site:

- Closed in 2020
- 3.5 million cubic yards

Aerial Photo Luke Paper Mill Site Highlighting the Ash Deposit

Development Over an Ash Deposit –

- Waugh Chapel Shopping Center.
- Significant groundwater contamination

Department of Natural Resources / Power Plant Research Program
Tasks Accomplished

- Inventory, map, and characterize coal ash deposits using historical data and LiDAR to track erosion.
- Chemically analyze ash deposits
- Monitor existing usage of ash
- Worked with Private Industry to develop a restoration group to plan, harvest, and transport CCBs.
- Continue dialog with industry to increase sales to cement, concrete, and clay product industries.
- Drafted the Coal Ash Resources of Maryland report and Coal Ash Resources of Chesapeake Bay (in review by CBP)

PPRP's Coal Ash Resources in Maryland Report

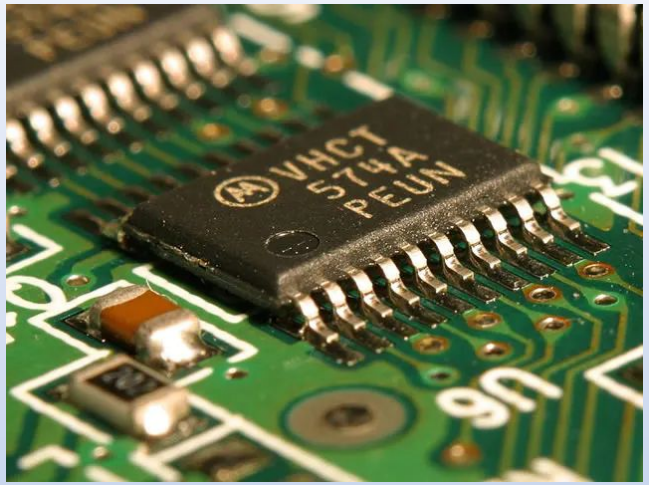
- Purpose: to identify coal ash deposits in Maryland based on aerial photos, historical records and online searches.
- Currently identified over 68 sites in Maryland
- Provides site-specific data including:
  - Owner
  - Quantity
  - Acreage
  - Material source
  - History
  - Systematic sampling

Cement Substitution

- Much of the coal ash in Maryland can be recycled into stabilized products such as drywall, concrete, grout, bricks, and tile.
- Presently 2 million tons of ash are recycled from the Chesapeake Bay watershed each year. (700K from MD). Four million tons to date from MD.
- Developed a flowable fill material that can be used for grouting, filling voids, and other structural needs.

Frostburg State University – Inserting ash grout into abandoned mine voids beneath the campus in 2018.

PPRP's Continued and Future Research



- Port of Baltimore funded a feasibility study to build a brick plant using dredged material and coal ash.
- Discussions with a tile manufacturer to build a plant in North America, preferable in Maryland using coal ash as a key ingredient.
- Advances in the automobile industry to use ash in metal matrixes to reduce weight.
- Electronic chips - using ash in a ceramic mixture of the base making the US less dependent on foreign markets
- Encourage the USGS to monitor coal ash deposit sites using LiDAR - and its possible aerial migration
- Continue to explore rare earth element extractions from coal ash.