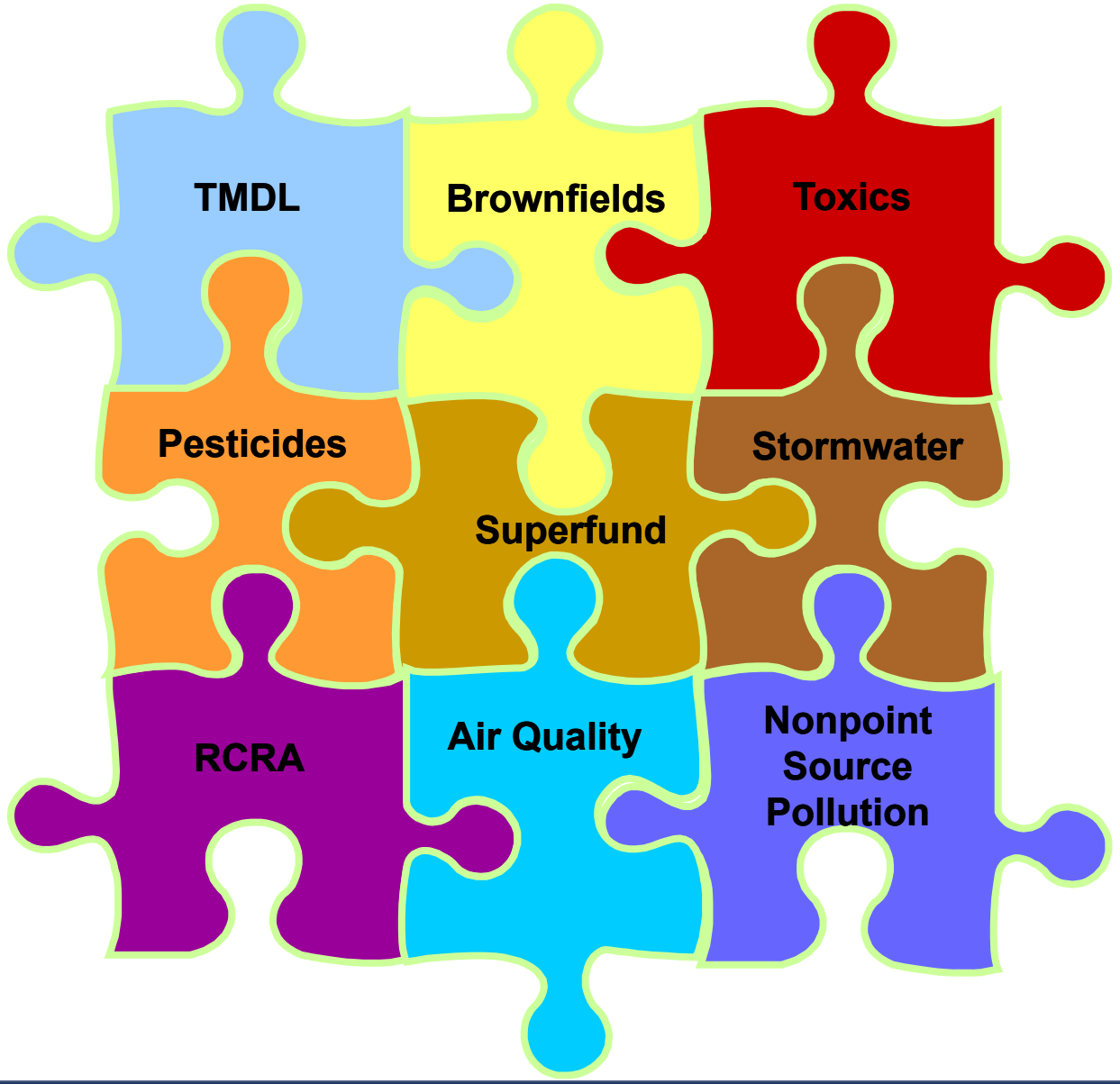
Bruce R. Pluta
US EPA Region 3
Biological Technical Assistance Group

CO-BENEFITS OF ECOLOGICAL REVITALIZATION

The Big Picture

Ecological Impacts of Landscape Change

- Degradation of natural landscape features:
  - Loss and fragmentation of forests
  - Loss of riparian buffers and wetlands
  - Stream channel and aquatic habitat impairment
- Loss of ecosystem services:
  - Carbon and nutrient cycling
  - Sediment trapping
  - Biodiversity
  - Flood mitigation
  - Climate change adaptation, etc.

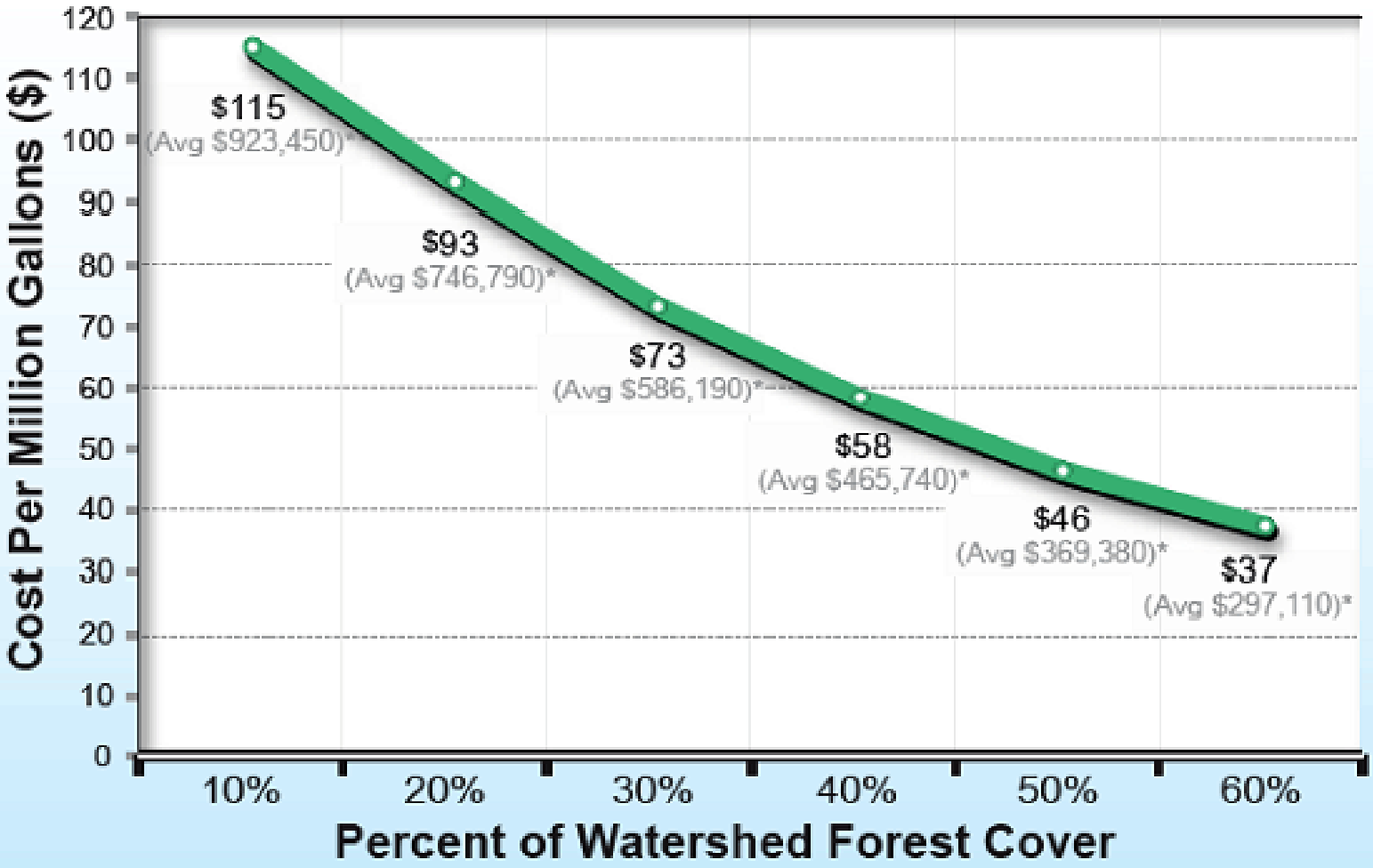

TMDL
Brownfields
Toxics
Pesticides
Superfund
Stormwater
RCRA
Air Quality
Nonpoint Source Pollution

Common Types of Ecosystem Services

- Climate regulation
- Purification of water and air
- Soil formation
- Carbon storage and sequestration
- Nutrient dispersal and cycling
- Seed dispersal
- Waste decomposition and detoxification
- Crop pollination
- Pest and disease control
- Food, crops, and spices
- Forest products (i.e. timber)
- Pharmaceuticals
- Energy (i.e. hydropower and biomass fuels)
- Recreation
- Scientific discovery and education
- Aesthetic and spiritual value


Browns Battery Breaking, Hamburg, PA

Relationship Between Forest Cover and Water Treatment Costs



*Average treatment costs are based on a per plant per year average of 8,030 million gallons.

Source: Ernst et al. 2004


Dorney Road Landfill, Mertztown, PA


Jacks Creek, Maitland, PA

Whitmoyer Labs, Myerstown, PA

Avtex Fibers, Front Royal, VA

Mill Creek Dump, Erie, PA

NAB Little Creek, Virginia Beach, VA


05 . 24 . 2006

Eastern Diversified Metals, Hometown, PA

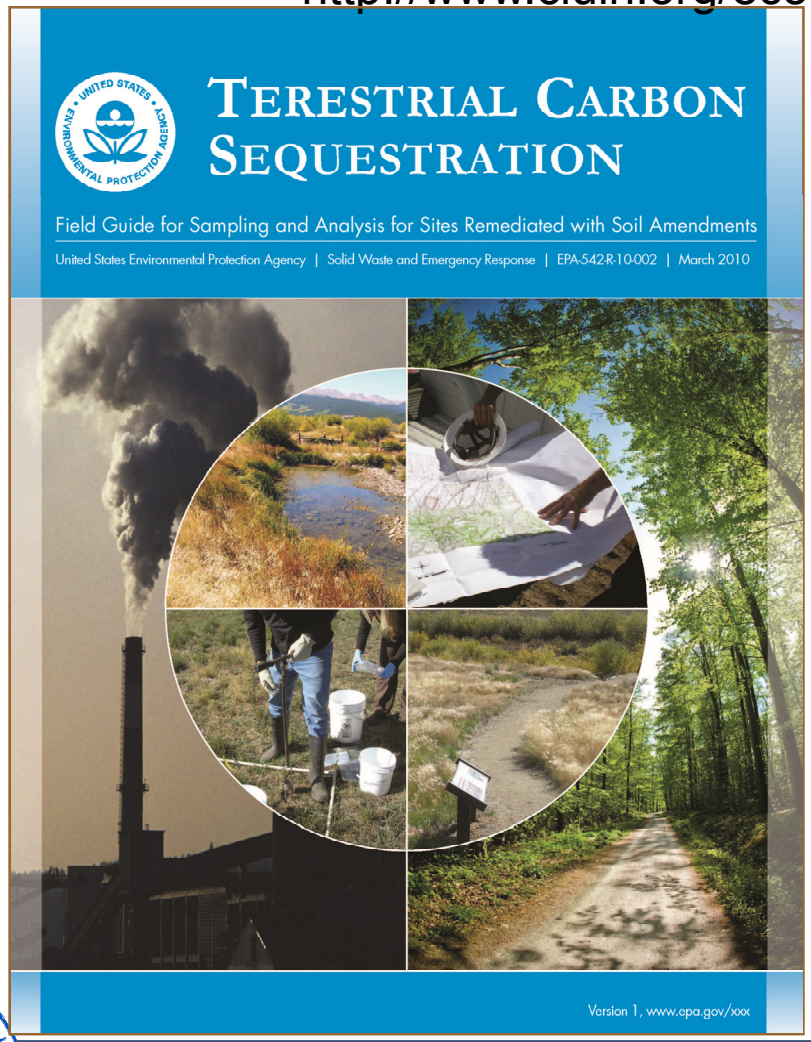
Revere Chemical, Revere, PA

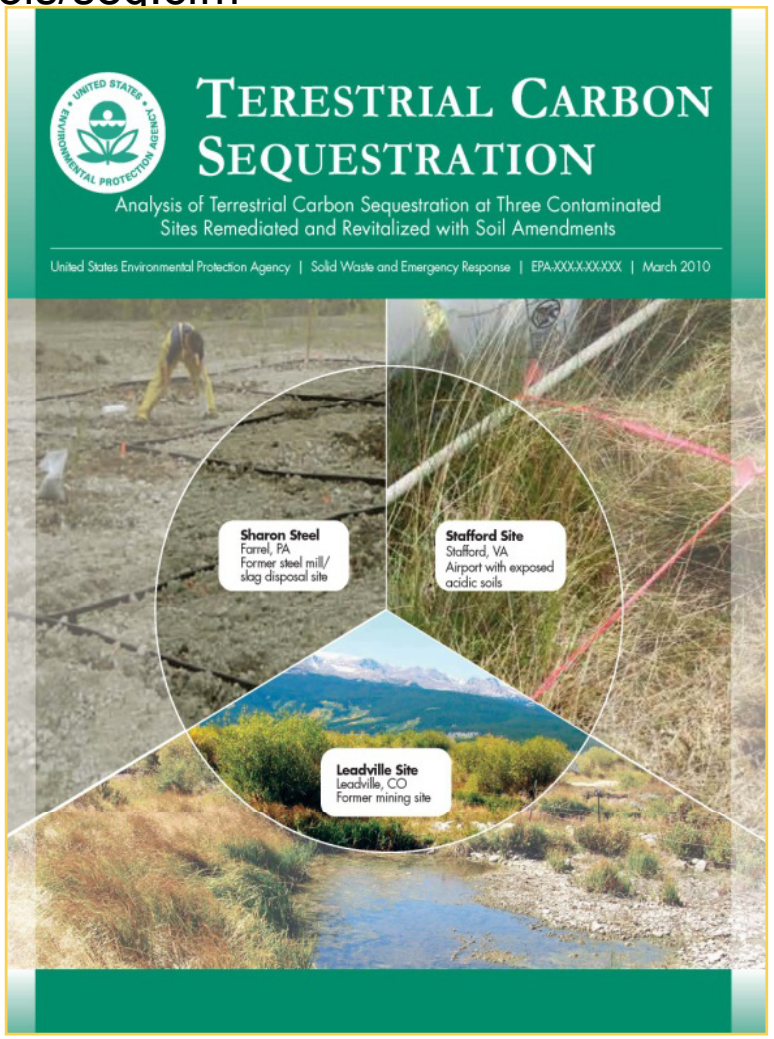
Sharon Steel, Farrell, PA


05.17.2007

EPA's Field Sampling Protocol plus an Analysis of TCS at Leadville, Sharon Steel, & Stafford

http://www.cluin.org/ecotools/seq.cfm



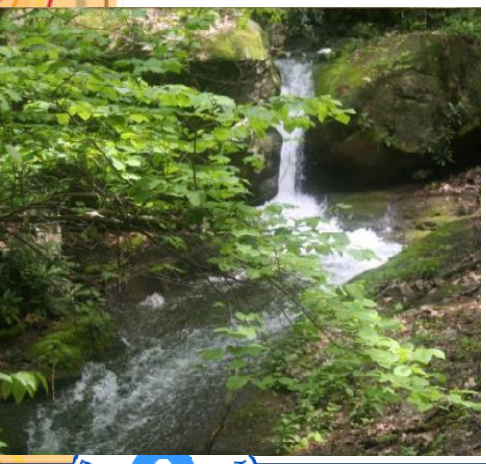


The Big Picture

Green Infrastructure

"Strategically planned and managed networks of *natural lands, working landscapes and other open spaces* that conserve ecosystem values & functions and provide associated benefits to human populations."

(Benedict and McMahon, 2006)



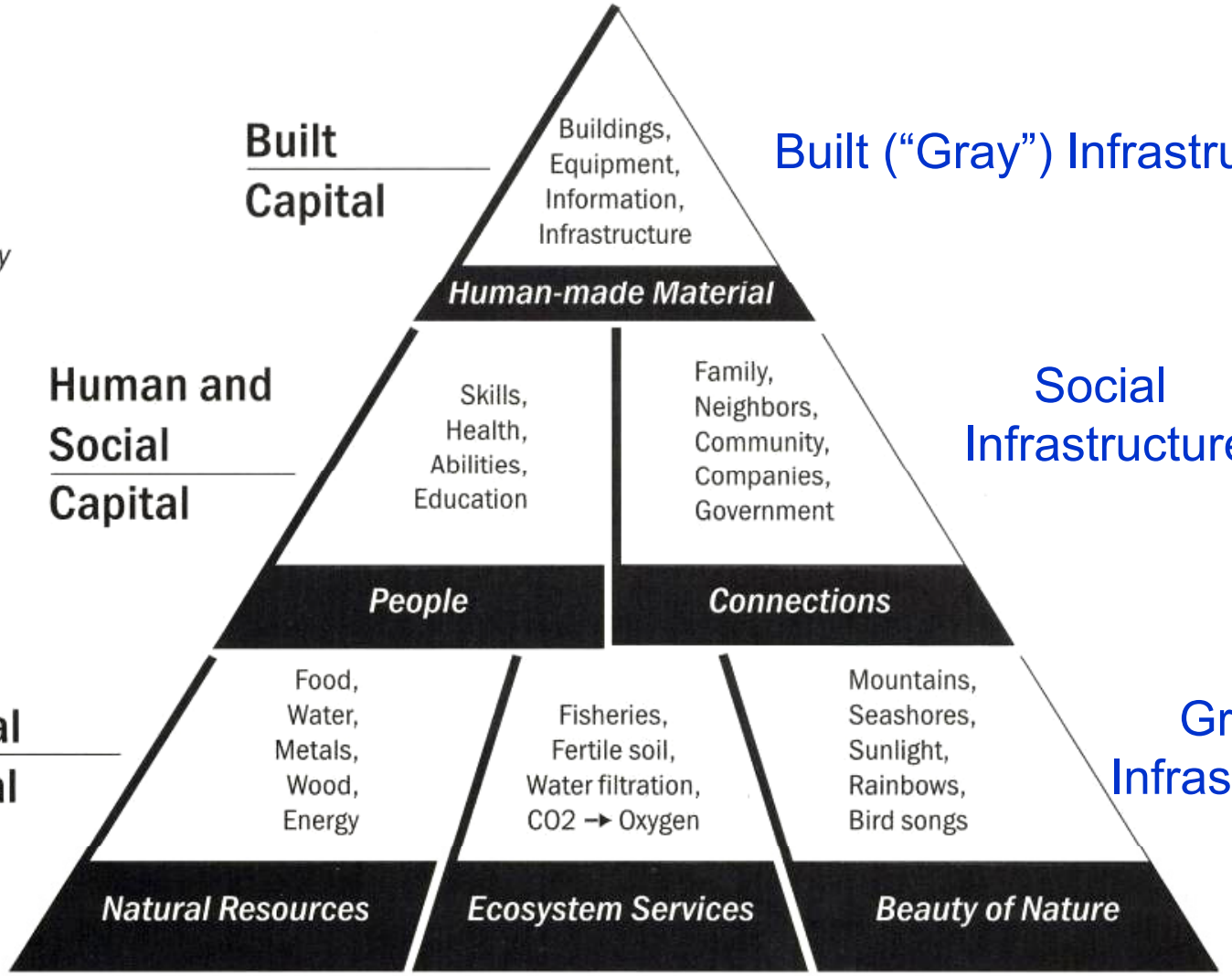


Figure 4
Community capital

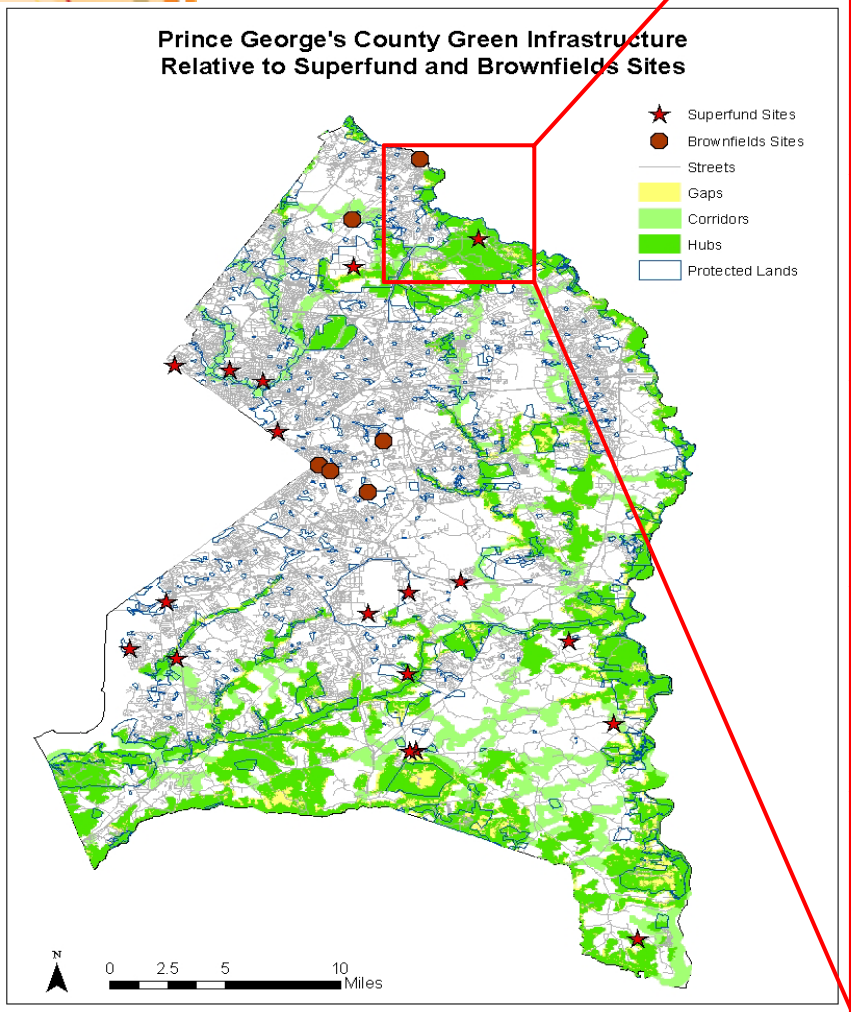
Built ("Gray") Infrastructure

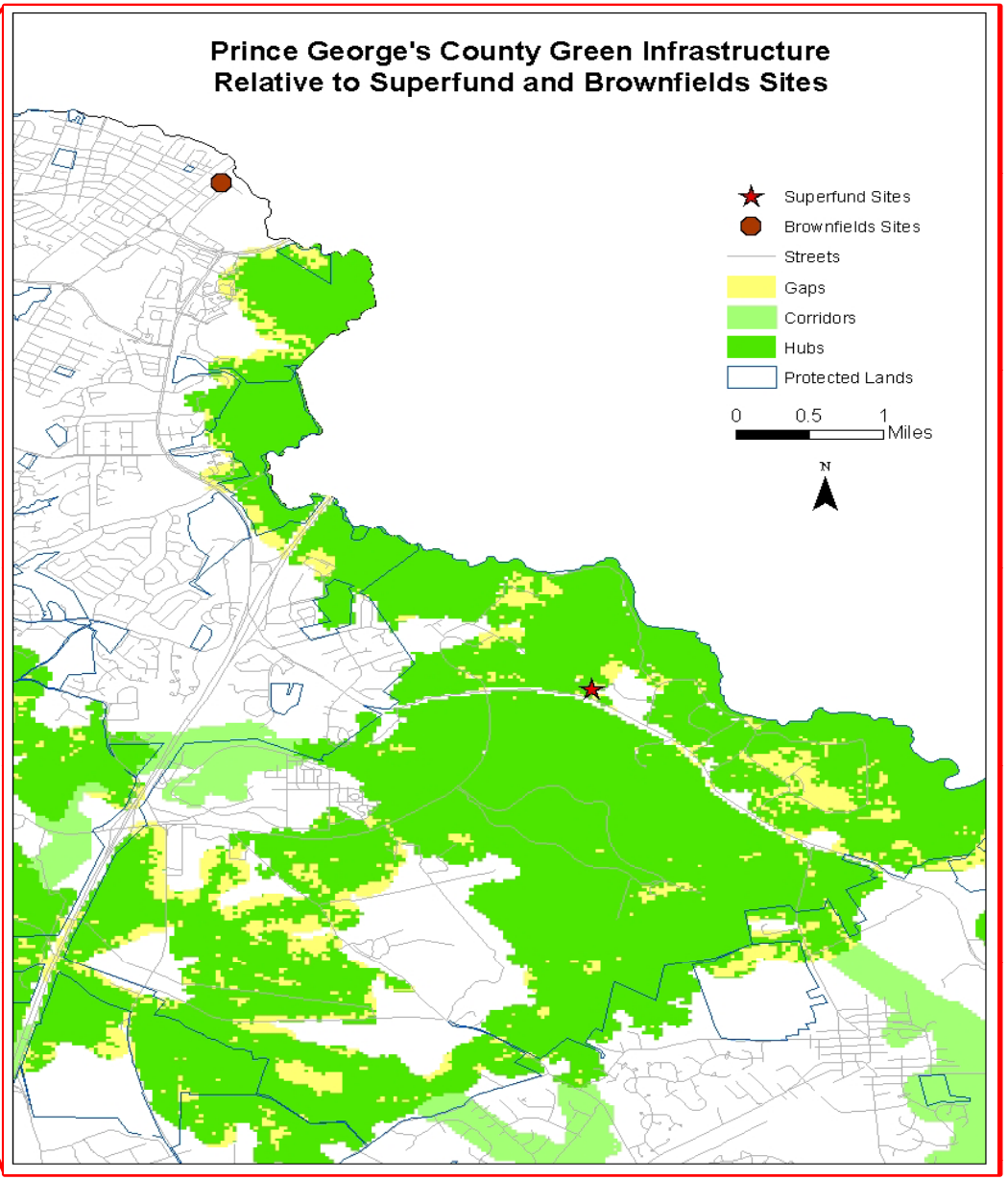
Social Infrastructure

Green Infrastructure

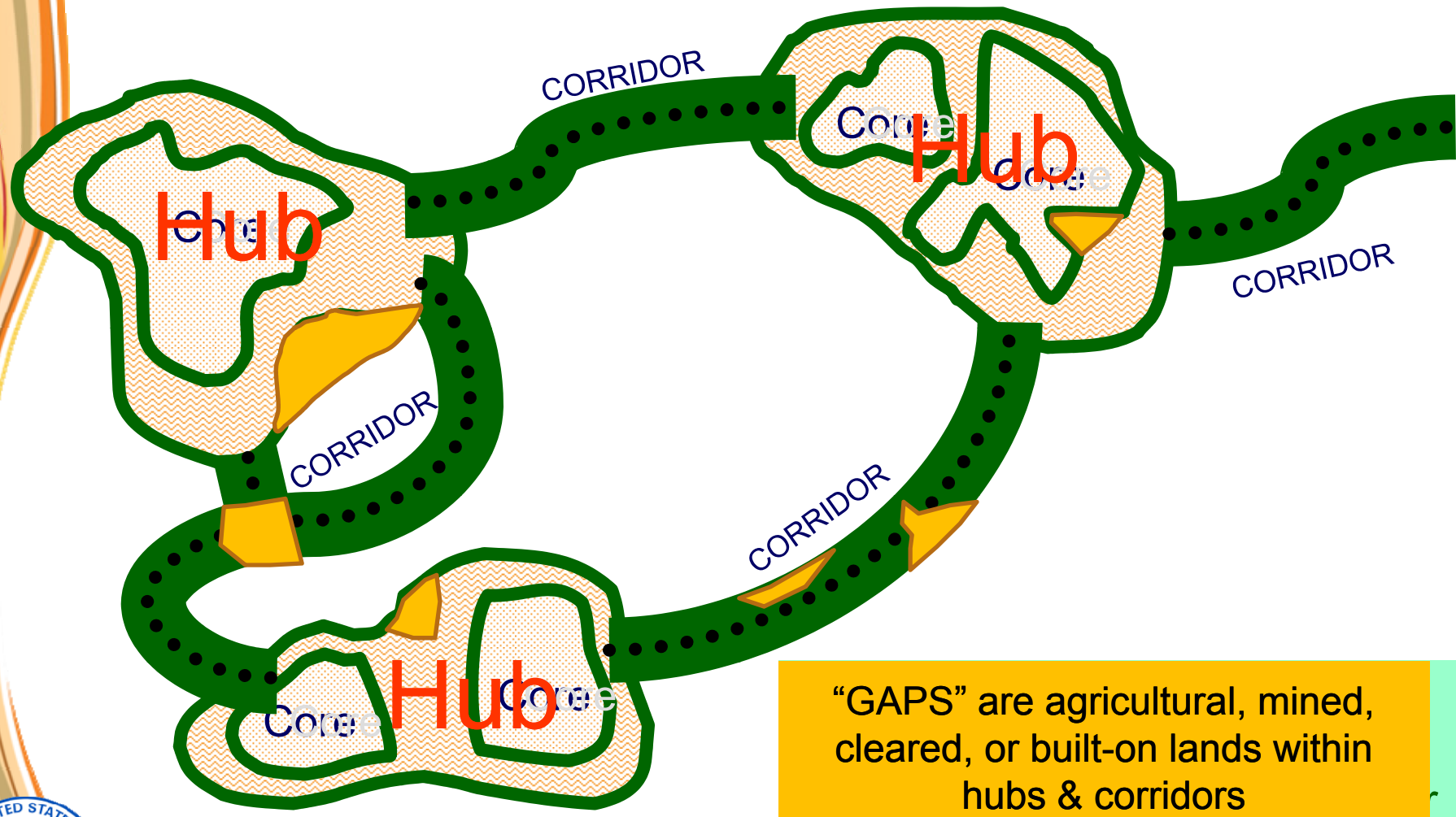
Source: Guide to Sustainable Community Indicators, Hart 1999

Maryland's Green Infrastructure Assessment overlaid with Superfund and Brownfield site locations.





Conceptual Green Infrastructure Model



"GAPS" are agricultural, mined, cleared, or built-on lands within hubs & corridors


Palmerton Zinc,
Palmerton, PA

BoRit Asbestos, Ambler, PA

Green "Urban" Infrastructure

Integrated networks or systems of built, protected and managed urban ecosystems that provide multiple, complementary functions (i.e. abiotic, biotic and cultural)in su pport of urban sustainability. (Ahern, 2007)

Green "Urban" Infrastructure

- Focus on the ecology of the built environment, as a complement to protecting the undisturbed environment.
- Plan, design, manage at multiple scales *(regional - neighborhood - site - construction details)* and across the land use spectrum.
- Need to consider the spatial patterns (e.g. connectivity) that support the processes, which determine the functions, of the urban landscape.
- Allows for strategic, proactive, technically defensible planning and implementation.

(Ahern, 2007)


Feb 19, 2007
Naval Station Norfolk, Norfolk, VA
Decatur Ave
Rodgers Ave
Hayes Dr
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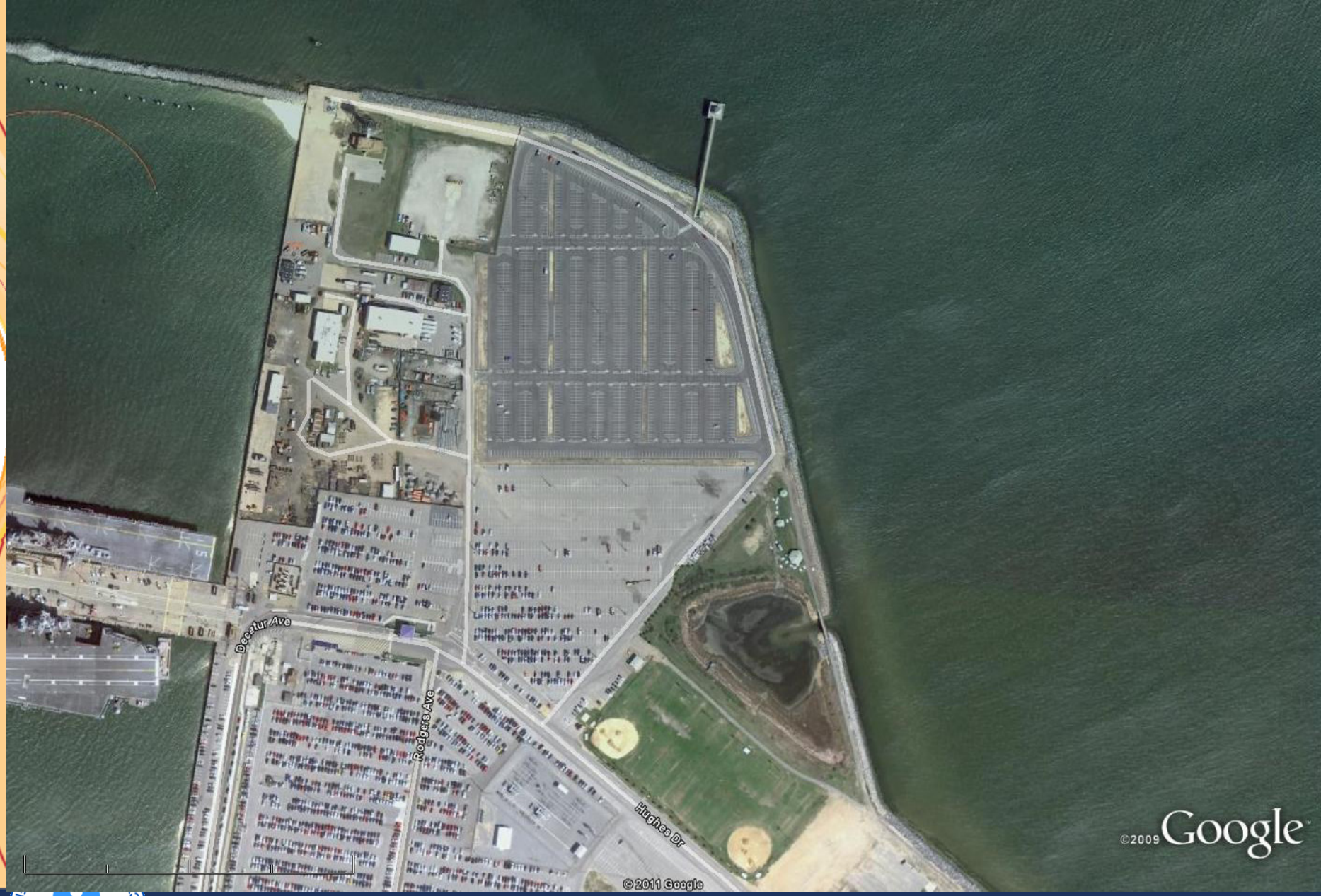
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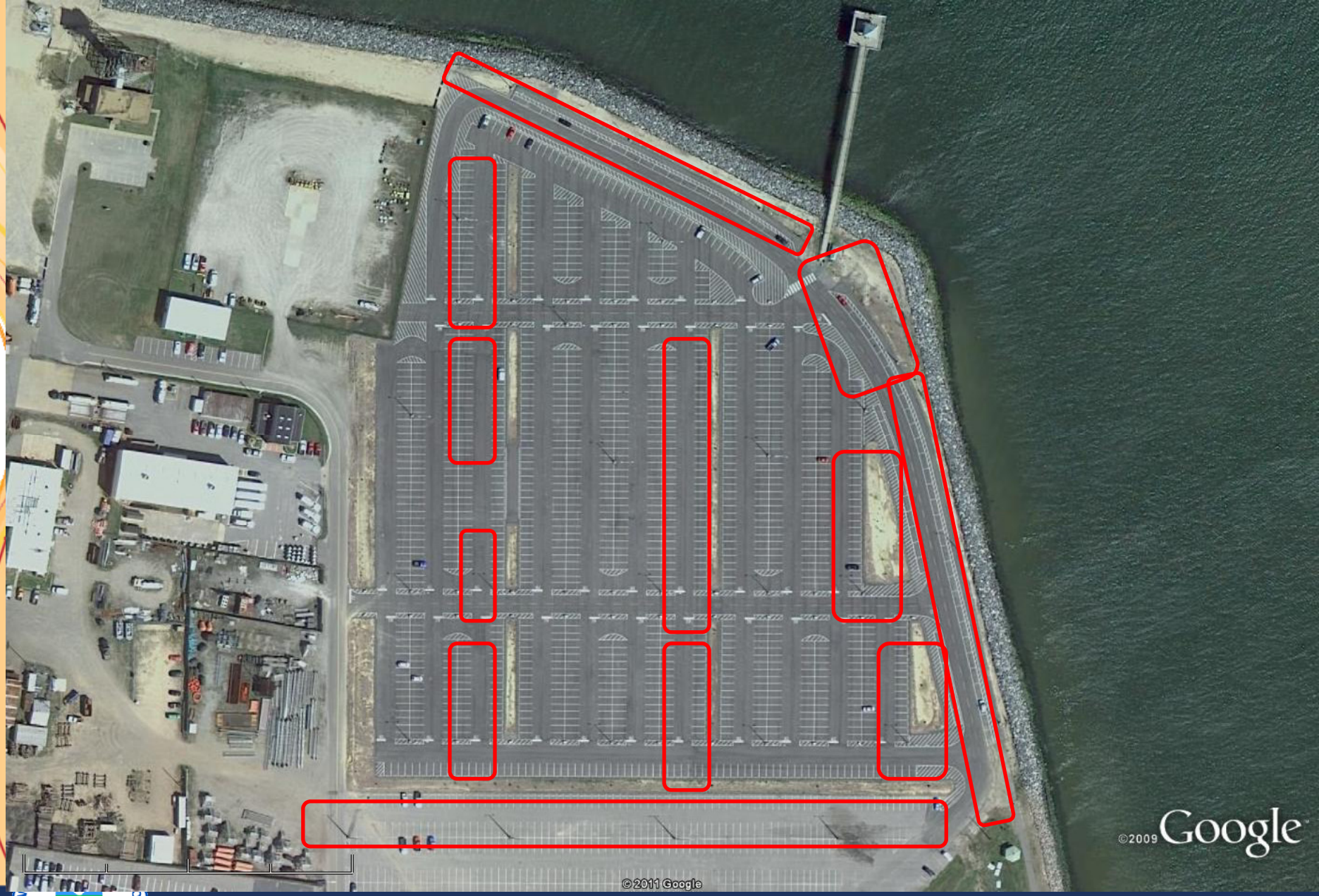
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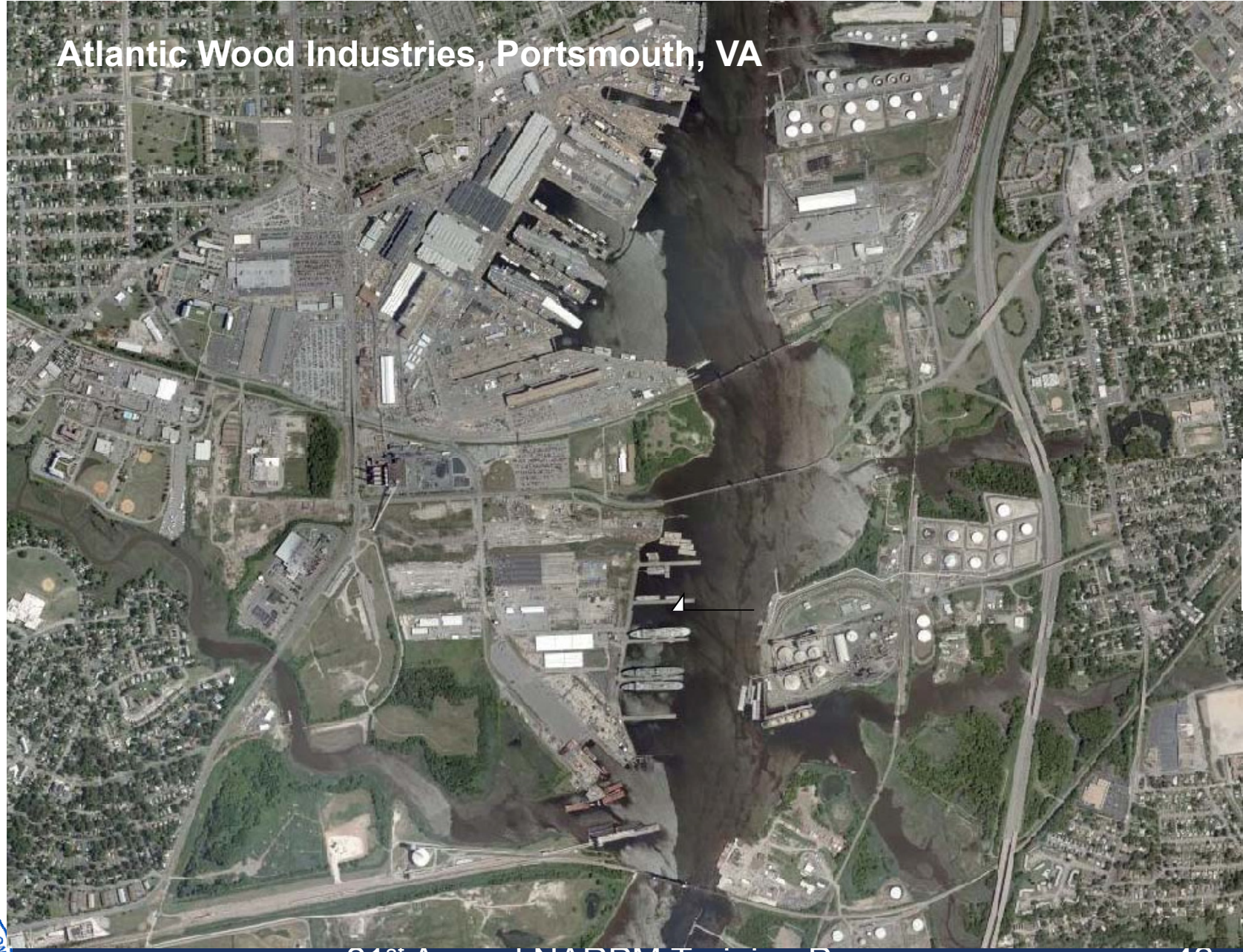
Atlantic Wood Industries, Portsmouth, VA

- Ecological Revitalization can be an integral component of site clean-up and re-development.

- Ecological Revitalization enhances the effectiveness of a clean up and result in long term cost savings.

- Sites which are restored utilizing ecological enhancements provide critical ecosystem services which fit into a larger context for improved environmental quality and health.

Contact Information

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