AQUATIC POLLUTION

PRESENTING THE SCOPE, AND
RELATING LOCAL WATERSHED CONTRIBUTIONS TO A GLOBAL CONCERN
The built environment

Human-watershed relationship.
HUMAN BEHAVIOR
A LOCAL PERSPECTIVE
HUDSON RIVER

- 315 miles (153 mile tidal estuary)
- 13,390 square-mile watershed
- NY (93%), NJ, CT, MA, VT
- 65 tributaries
- 60% forested, 25% agriculture, 8% urban
- People!
  - uses: commerce, recreational boating, swimming, fishing
City of Newburgh consists of both combined and separate sewer systems.

- **Combined system:**
  - 68% sewershed
  - 13 permitted discharge points along Hudson & Quassaick
  - 185 MG overflow annually

- **Separate system:**
  - 32% sewershed
  - 283 known outfalls
A GLOBAL CONNECTION
Plastic waste inputs from land into the ocean in 2010

The 182 countries with a coast bordering Atlantic, Pacific, and Indian oceans, Mediterranean and Black seas produced a total of 2.5 billion metric tons of solid waste. Of that, 275 million metric tons was plastic, and an estimated 8 million metric tons of mismanaged plastic waste entered the ocean in 2010.

Mitigation options:
- Reduce plastic in waste stream
- Improve solid waste management infrastructure
- Increase capture

*Plastics Europe, “Plastics—the Facts 2013” (2014 data)
*Cooter et al., 2014, Ellison et al., 2014

Graphic by Lindsay Robinson, University of Georgia
IMPACTS
IMPACTS

• Persistence – plastic degradation mainly physical, not chemical (EPA)
• Toxins migration (EPA)
• Invasive/opportunistic species migration (Woods Hole)
• Over 600 species impacted, microorganisms through whales (UNEP)
• $13B in damage to marine ecosystems annually (UNEP)
  • $5-8 per person per year in municipal taxes to prevent marine debris (Columbia)
Narrative water quality standard for garbage: “none in any amounts”

35 impairments
MOVING FORWARD
EPA APPROACH

• Research
  • Staff
  • Citizen Science
• Funding
• Permit progression
• Education
• Stakeholder support
SOLUTIONS

• Change human behavior:
  • Voluntarily: gather people at the waters’ edge – the Clearwater model.
  • Involuntarily: high-risk litter and/or refuse container covering ordinances.

• Permit progression
  • MS4
  • LTCP

• Municipal and business leadership
  • Point & non-point
    • Education campaigns
    • Incentives
    • Above and beyond permit requirements
HUMAN BEHAVIOR
THE END

Joshua Kogan, PE
Kogan.Joshua@epa.gov