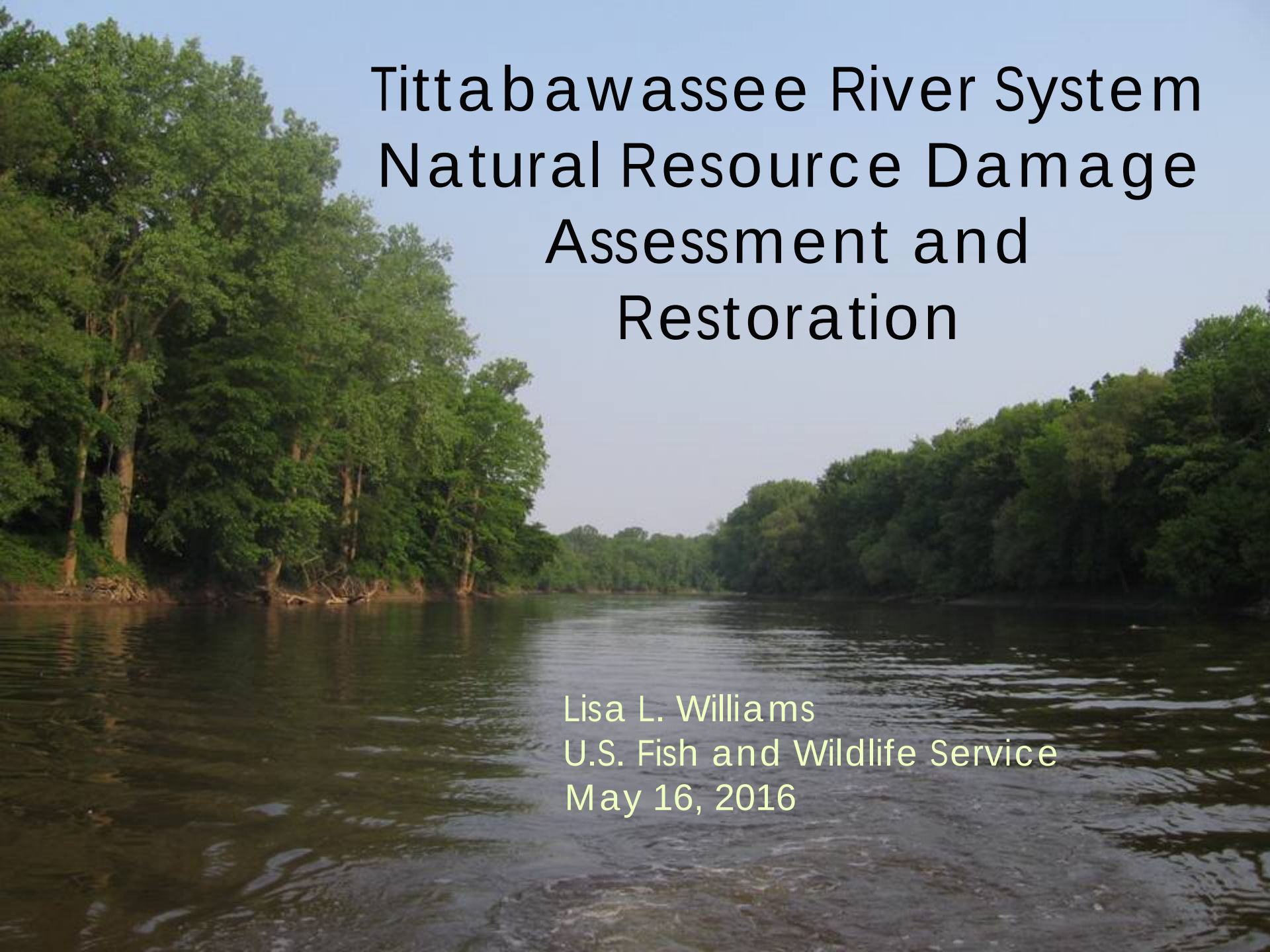

Tittabawassee River System Natural Resource Damage Assessment and Restoration

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May 16, 2016

Outline

- Background information
  - What is NRDAR?
  - How does NRDAR fit in with this site?
- Tittabawassee River System assessment
  - Assessment area
  - Natural resources of the assessment area
  - Exposure to contaminants
  - Assessment approaches
- Looking toward restoration

What is NRDAR?

- Natural Resource Damage Assessment and Restoration
- Created by Congress in addition to the processes for cleanup of hazardous substances
- Following a spill or other releases, agencies act on behalf of the public *to replenish the common store of natural resources* for public use and enjoyment

NRDAR vs. Cleanup

- Both authorized under CERCLA
  - Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
- Both also authorized under additional laws
- Cleanup is done as response, remediation and corrective action
  - To protect human health and the environment
  - EPA can issue unilateral orders for cleanup
- NRDAR
  - To make the public whole through restoration
  - Trustees must negotiate and settle or litigate

Natural Resources

- "Natural resources" means land, fish, wildlife, biota, air, water, groundwater, drinking water supplies and other such resources…
- …belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by trustees (CERCLA §101)
- For Tribal Trustees, natural resources include natural resources related to tribal subsistence, cultural uses and spiritual values and uses that are preserved by treaties

NRDAR Goal

- Restore injured natural resources and the services they provide
- For NRDAR, “restore” means:
  - restore, rehabilitate, replace, or acquire the equivalent of injured natural resources and services

How does NRDAR work?

- Compensatory, polluter pays
- Government agencies (Trustees) act on behalf of the public
- A structured process defined in regulations:
  - Determine injury through time to natural resources
    - Including understanding losses to public
  - Assess damages based on injuries
    - What is needed to restore and compensate
    - Work with public on restoration opportunities
  - Recover damages as money or restoration projects via a negotiated settlement or litigation
  - Implement and evaluate restoration

Trustees

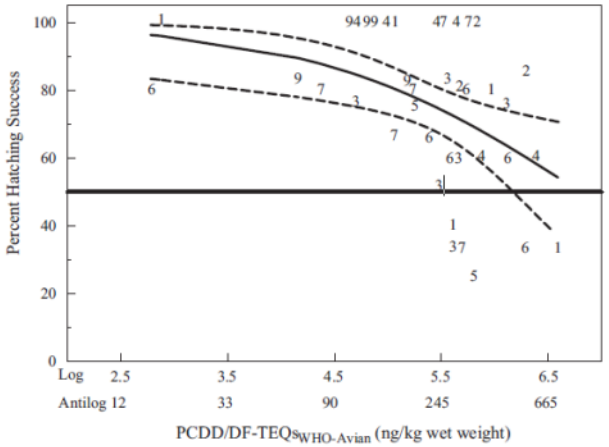
- Work on behalf of the public
- Specified by law and regulations
- Include:
  - State Governors
  - Federally-recognized tribes
  - Secretaries of certain federal departments

Trustees

- For the Tittabawassee River:
  - State of Michigan represented by
    - MDEQ
    - MDNR
    - Attorney General
  - Saginaw Chippewa Indian Tribe of Michigan
  - Department of the Interior represented by
    - U.S. Fish and Wildlife Service
    - Bureau of Indian Affairs

Injury

- *What is broken….*
- A measurable or observable adverse change in the quality, viability, or value of natural resources and the services that they provide.
- Defined in regulations – 43 CFR §11.14
- Not the same as risk
- Includes loss and destruction
- Federal regulations provide resource-specific definitions that can be used to determine if a natural resource has been harmed or “injured”



Services provided by natural resources

- Physical and biological functions performed by the resources including human uses
- Any function performed by a resource for another resource or humans
- Examples:
  - Healthy habitat
  - Food chain (forage, prey)
  - Recreational and cultural uses such as fishing, gathering

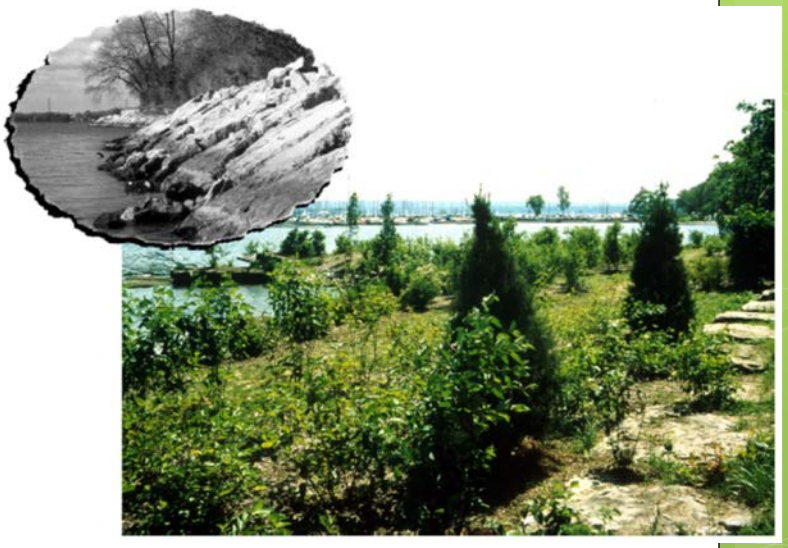
Damages

- *What does it take to fix it….*
- Restoration
  - Primary
    - Return injured resources to baseline
  - Compensatory
    - Additional restoration to address losses over time
- Costs of Assessment

- 43 CFR §11.15

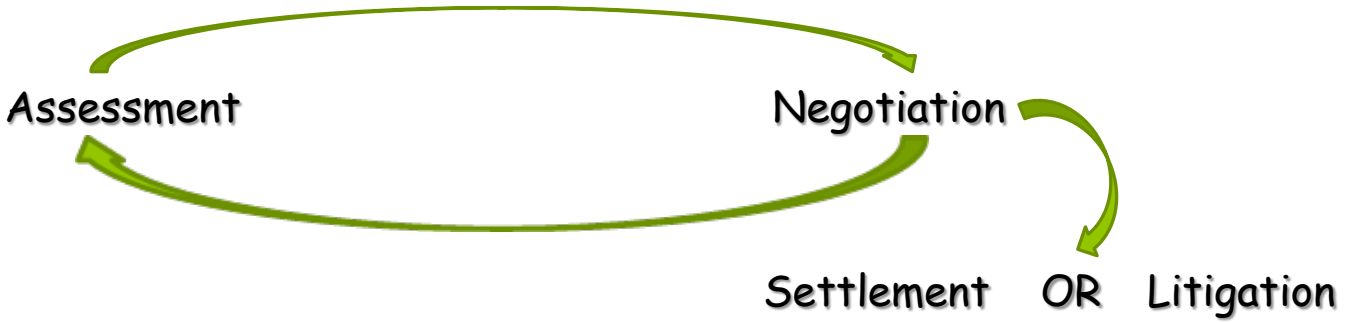
Restoration

- To baseline:
  - Condition that the resources would have been in had the release of hazardous substances not occurred
  - Includes addressing direct and indirect impacts
- Compensatory:
  - When the public experiences losses in natural resources and their services: past, present, and future
  - Compensation is in the form of restoration



NRDA Steps

- Pre-assessment screen
- Assessment Plan and assessment phase



- Post-assessment phase
  - Restoration
  - Monitoring

How does NRDA fit into this site?

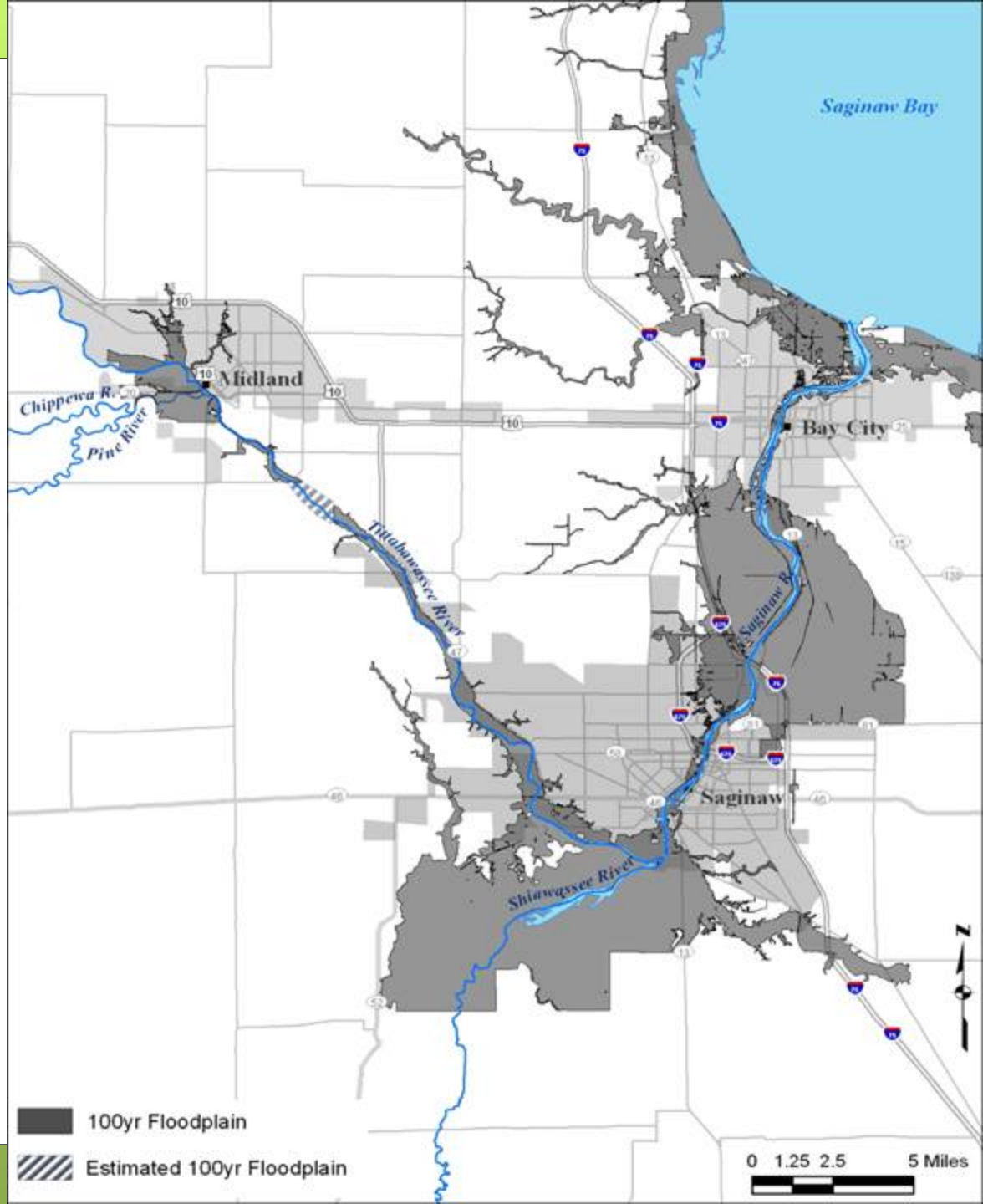
- RCRA License Corrective Action and Superfund Alternative Site Process
  - Interim Responses and Removal Actions
  - Remedial Investigation, Human Health Risk Assessment, Ecological Risk Assessment, Feasibility Study, Remedial Action Plan
- NRDAR
  - Assess injuries and determine amounts and types of restoration needed
    - Share information, but some analyses are unique
    - Depends on timing and completeness of cleanup
  - Restoration actions can build on cleanup actions

Tittabawassee River NRDAR Damage Assessment Plan

- Trustees plan published in April 2008
- Describes Trustees' approach for conducting a NRDAR
- Addresses losses caused by natural resource injuries resulting from Dow's releases of hazardous substances
- Describes methods to determine and quantify natural resource restoration work necessary to make the public whole

Assessment Area

- Where contaminants have come to be located
- Tittabawassee & Saginaw Rivers & floodplains, Saginaw Bay
- Aerial deposition areas from Dow's Midland plant



Natural Resources of the TRSAA

- Land, fish, wildlife, biota, air, water, groundwater, drinking water supplies, resources for tribal cultural and spiritual uses…for example:

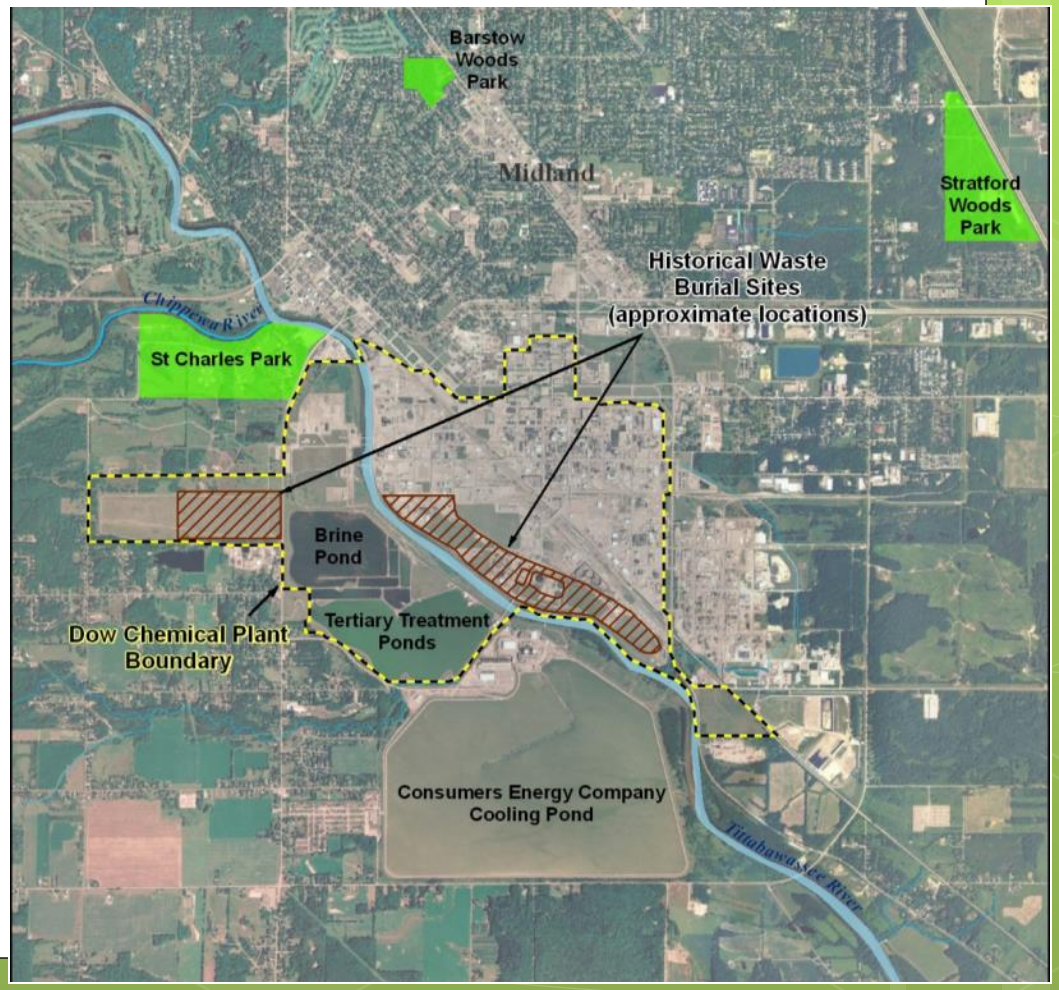
- Rivers and floodplains, wetlands, forests

Natural Resources of the TRSAA

- Fish: carp, catfish, walleye, white bass, sucker
- Birds: bald eagle, great blue heron, belted kingfisher wood ducks, tree swallows
- Mammals: mink, fox, deer, muskrat
- Reptiles, amphibians
- Invertebrates

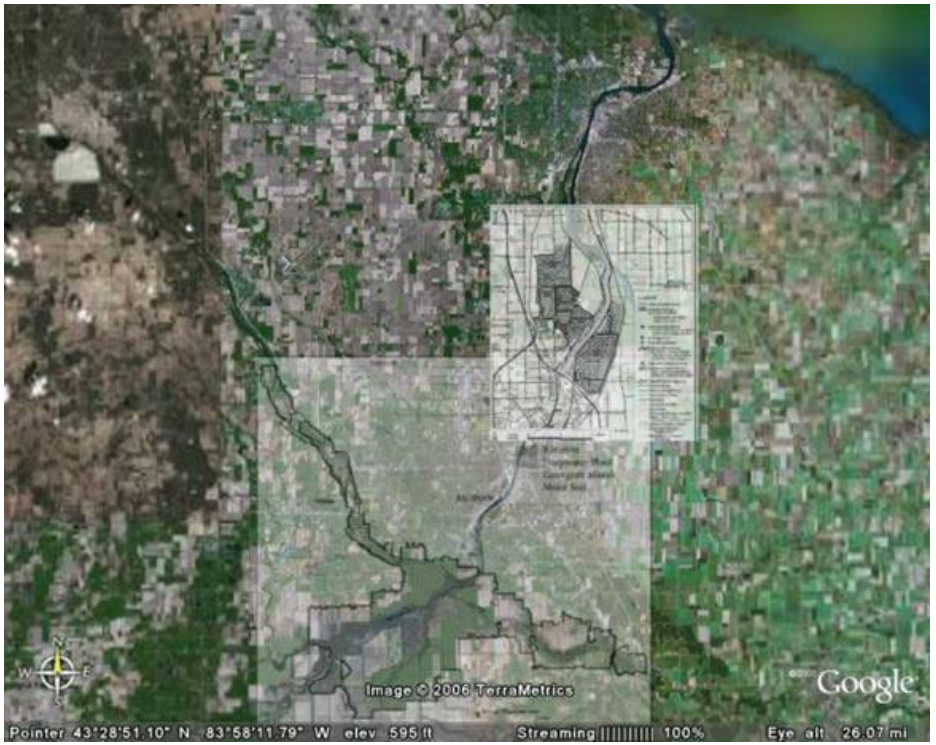
Natural Resources of the TRSAA

- Park lands
- Biota affected by aerial deposition



Natural Resources of the TRSAA

- Park lands in river floodplains
  - Shiawassee National Wildlife Refuge
  - Crow Island State Game Area
  - Local and county parks



Confirmation of Exposure

- Multiple lines of evidence that confirm exposure:
  - Sampling data across multiple environmental media
  - Wide array of advisories

Middle Saginaw River - Vegetated Shoreline near Airport

Confirmation of Exposure

- Other data sources confirming exposure of natural resources are summarized in the Trustees' Assessment Plan:
  - Surface water and sediment
  - Biota
  - Groundwater

Lower Saginaw River - Vegetated Riprap at Railroad Trestle

Assessment Approach

- The trustees are conducting an assessment to determine:
  - Nature and extent of injuries to natural resources (past, present, future)
    - Biota, habitats, human uses
    - Effects of cleanup actions
  - Restoration opportunities that could offset the injuries
  - Appropriate amount and types of restoration

Assessment Approach

- Cooperative assessment with Dow
  - Funding and participation agreement
  - Cooperative technical workgroups
    - human services, ecological injuries, and restoration
  - Cooperative studies
- Independent Trustee studies and analyses
  - Injury and scaling restoration amounts
  - Restoration workshop with resource experts

Assessment: Injuries

- Injuries to natural resources
  - Toxicity, e.g. reduced reproduction
  - Diminished uses, e.g. from advisories
  - Indirect losses, e.g. from response actions
- Injury and pathway determination
  - Compilation and evaluation of existing site-specific data
  - Identification of additional data needs and studies

Assessment: Injuries (*not*)

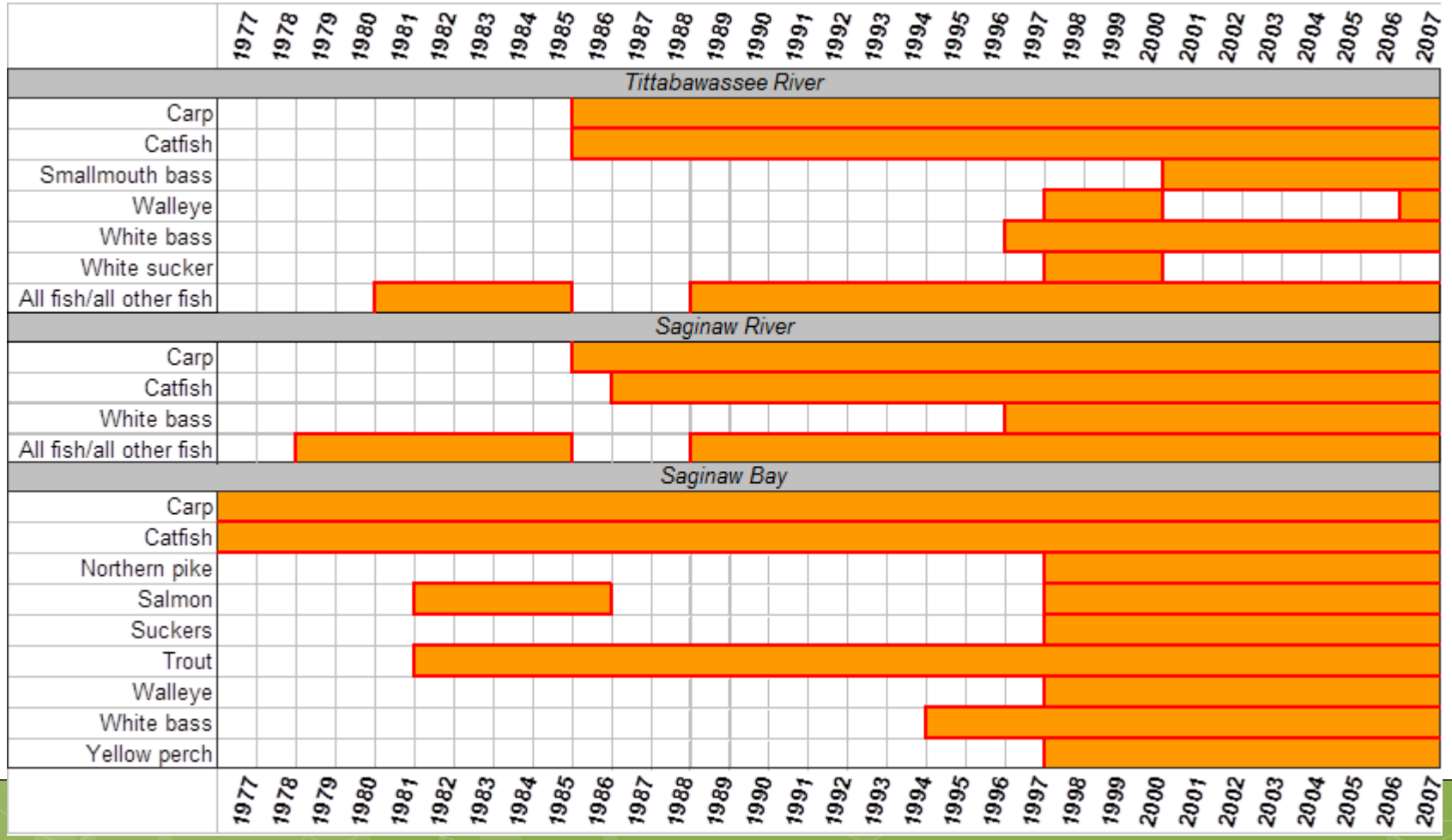
- Watersheds and rivers have been influenced by other stressors
  - E.g. logging, dams, agriculture, industry
  - NRDAR does not include these in injury assessment

Assessment: Advisories

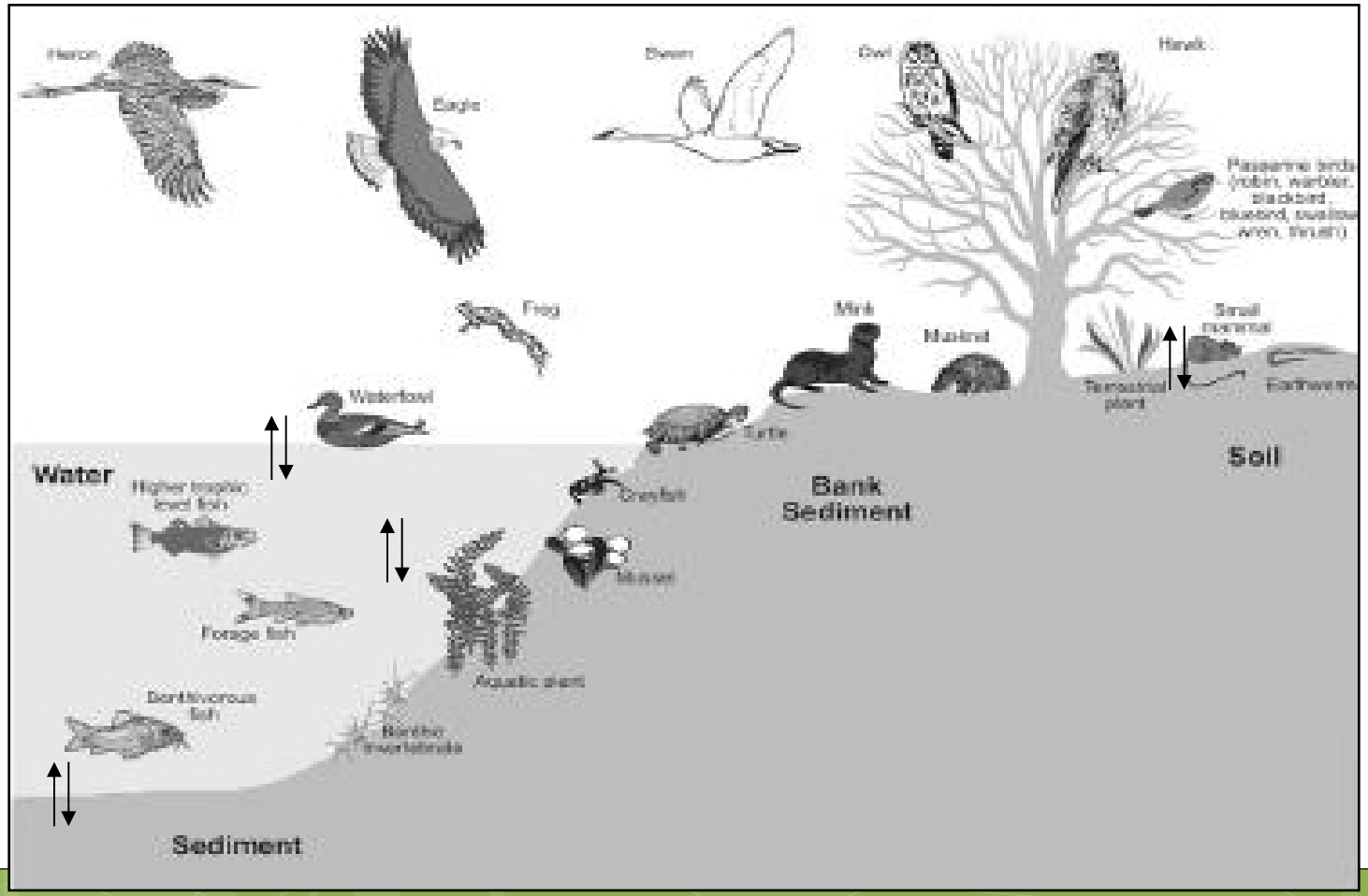
- Advisories
  - Fish
  - Wild game (deer, turkey, squirrel)
  - Soil Contact

Assessment: Advisories

History of fish consumption advisories for dioxins



Assessment: Pathway



Assessment: Restoration

- Restoration opportunities and evaluation
  - Identify restoration ideas
  - Evaluate using trustee criteria
  - Relate restoration to injury

Assessment: Restoration Scaling

- Scaling restoration gains to losses caused by injuries
  - Different scaling approaches can be used:
    - Cost based on resource-to-resource scaling
      - e.g. more mink through habitat restoration for mink reproduction losses
    - Cost based on habitat-habitat scaling
      - e.g. acres for acres
    - Value of losses caused by injuries
      - e.g. value of reduced recreational fishing
  - Values of gains caused by restoration used to offset losses

Assessment: Restoration Criteria

- Developed by Trustees for this case
  - Published in Assessment Plan
    - http://www.fws.gov/midwest/es/ec/nrda/TittabawasseeRiverNRDA/
- Based on criteria in federal regulations at 43 C.F.R. § 11.82
- Purpose:
  - Guide collection of restoration ideas
    - From public and organizations
  - Guide selection of projects to address injuries

Restoration Criteria: Categories of Criteria

- Eligibility
- Focus
- Implementability
- Benefits

Restoration Criteria: Eligibility

- Complies with applicable/relevant federal, state, local, and tribal laws and regulations
- Benefits natural resources injured by hazardous substances
- Is technically feasible

Restoration Criteria: Focus

- Restores, rehabilitates, replaces, or acquires the equivalent of injured natural resources
- Addresses natural resources that are trustee priorities
- Targets resources or services that will require a long time to recover naturally

Restoration Criteria: Implementation

- Cost effective
- Benefits can be measured
- Uses methods known to be successful
- Takes into account completed or anticipated response actions
- If the project involves source control, it reduces exposure of natural resources
- Is consistent with regional planning

Restoration Criteria: Benefits

- Provides the greatest scope of benefits to the largest area or population
- Provides benefits not being provided by other programs
- Aims to achieve environmental fairness
- Maximizes the time over which benefits accrue

Assessment: Restoration Ideas

- Trustees and Dow are collecting ideas
- Trustees always welcome public input
- Restoration concepts:
  - e.g. coastal wetland restoration, fish passage, habitat continuity, invasive species control, shoreline 'softening'
- Specific projects ideas proposed to Trustees:
  - e.g. wetland restoration at SNWR, fish passage at Dow dam, purchase of available property adjacent to public land

Restoration Idea Sources

- Saginaw Bay Watershed Initiative Network (WIN)
- Saginaw Bay Coastal Initiative
- Saginaw River/Bay RAP Update
- Ducks Unlimited
- The Nature Conservancy
- Saginaw Basin Land Conservancy
- Townships, Counties, Individuals
- Michigan United Conservation Clubs
- MDNR, MDEQ and USFWS
- Saginaw Chippewa Indian Tribe of Michigan
- Dow

Summary

- NRDAR is a complementary, parallel, yet distinct process from the cleanup.
- The goal of NRDAR is to restore: return to baseline and compensate for losses over time.
- NRDAR must…
  - address injuries that resulted from the release of contaminants
  - focus on natural resources

Next Steps?

- Continue to coordinate with response
- Continue to develop ideas for potential restoration projects
- Report on results of assessment
- Determine damages
- Negotiate with Dow

- ...Restoration projects

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