The Green Bay NRDA: Opening Government Litigation Cases to Public and Scientific Scrutiny

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Overview

- What is the Green Bay NRDA?
- Publication issue
- What was published?
  - Leading up to the NRDA
  - The NRDA administrative record
- Major findings of the work
- Major conclusions about the open process
What is the Green Bay NRDA?
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- Statutory cause of legal action (CERCLA, CWA) that addresses hazardous substance releases
- Governmental plaintiffs represent the public
  - U.S. FWS
  - NOAA
  - Menominee and Oneida Tribes
  - Wisconsin DNR
- Potentially Responsible Parties are defendants
  - Paper mills that released PCBs to Fox River
What is the Green Bay NRDA?

**Cleanup/response**
- Part of the Superfund Law
- EPA, USGG, and State EPAs
- RI/FS, ERA, ROD, RD/RA
- Dredging, capping, natural attenuation
- $Fund and orders for immediate action

**NRDA**
- Part of the Superfund Law
- FWS, NOAA, State DNRs, and Tribes
- PAS, AP, ROA, RP
- Restoration, especially of habitat
- *De novo* trial
What is the Green Bay NRDA?

- Technical approach
  - Critical chain of events
  - Goal: break the chain; restore the environment
Publication Issue
NRDA usually treated as preparation for litigation
  ▪ Leverage in amount of settlement
  ▪ Prepare for war to prevent war
  ▪ Trial necessary if agreement not reached
Publication Issue

- Litigation strategies usually include confidentiality
  - Do not forecast strategies to other side
  - Do not create contradictory records
  - Choose and protect expert witnesses carefully
  - Administrative record weaker for NRDA than $Fund
    - Probably no “record review” with “arbitrary and capricious” standard of review
    - “Rebuttable presumption” may not be much of an advantage
However, publication has certain advantages for public agencies

- Professional academics more likely to participate
- Public involvement and acceptance required by public agencies
- Inertia and influence
  - scientific community
  - elected officials
  - other agencies
  - PRPs
Publication also has certain advantages for attorneys:

- Peer-reviewed, published literature more likely to be admitted under *Daubert* (Supreme Court)
- Rebuttable presumption may be significant
- Even without “record review,” a publicly vetted administrative record can be more persuasive
- Judges often don’t like public agencies to behave like private litigants
What Was Published?
What Was Published?

- How much was published?
- 43 scientific papers in the peer-reviewed literature (and counting)
- 16 formal documents signed by the “Authorized Official” on behalf of the United States
- 60 presentations at scientific conferences (and counting)
- 25 public meetings, including 5 public hearings
- 3 scientific surveys of public attitudes and values
- Complete list available upon request
What Was Published?

- Leading up to the NRDA (bird injury studies by FWS)
  - Hickey and Anderson 1968 (*Science*)
  - Faber and Hickey 1973 (*Pestic. Monit. J.*)
  - White and Cromartie 1977 (*Wilson Bull.*).
Leading up to the NRDA (bird injury studies by FWS)
- Kubiak et al. 1989 (*Arch. Environ. Contam. Toxicol.*)
- Custer 1991 (*Colonial Waterbirds*)
- Tillitt et al. 1992 (*Environ. Toxicol. Chem.*)
- Custer and Bunck 1992 (*J. Field Ornithol.*)
- Rattner et al. 1993 (*Environ. Toxicol. Chem.*)
- Custer et al. 1994 (*Arch. Environ. Contam. Toxicol.*)
- Williams et al. 1995 (*Arch. Environ. Contam. Toxicol.*)
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- Leading up to the NRDA (bird injury studies by FWS)
  - Custer and Custer 1995 (*J. Environ. Toxicol. Chem.*)
  - Williams et al. 1995 (*Arch. Environ. Contam. Toxicol.*)
  - Rattner et al. 1996 (*Environ. Toxicol. Chem.*)
What Was Published?

- The formal administrative record for the NRDA
  - DOI 1994: Preassessment Screen
  - FWS 1996: Assessment Plan
  - FWS 1997: Assessment Plan Addendum
  - FWS 1998: Initial Restoration and Compensation Determination Plan
  - FWS 1998: Fish Consumption Advisory Determination
  - FWS 1999: Avian Injury Determination
  - FWS 1999: PCB Pathway Determination
What Was Published?

- The formal administrative record for the NRDA
  - FWS 1999: Fishery Injury Determination
  - FWS 1999: Surface Water Injury Determination
  - FWS 2000: Assessment Plan Addendum
  - FWS 2000: Restoration and Compensation Determination Plan
  - Trustees 2002: Restoration Plan and Environmental Assessment
Major Findings of the Work
PCB Pathway

- Publications
  - FWS 1999: Pathway determination
  - Cacela et al. 2002 (*Environ. Toxicol. Chem.*)

- Findings
  - Analyses of sources, loadings, mass balance modeling, spatial and temporal gradients, mixing patterns, PCB congener patterns
  - Paper Mills->Fox River/Green Bay Sediments->Biota
PCB Pathway: Mass loadings

NCR PCB Emulsion Consumed (lbs/year)

Emulsion Consumed (lbs/year)

Millions

Paper

Emulsion

Figure 3

Appleton Papers, Inc. - Appleton Mill

NCR PCB Emulsion Consumed (lbs/year)
PCB Pathway: Tributary Loadings

Green Bay Tributary Loads of PCB

- Escanaba: 1.7%
- Peshtigo: 6.1%
- Menomine: 4.0%
- Oconto: 1.0%
- Fox: 87.3%
PCB Pathway: Temporal Trends
Aquatic Injuries

- Publications
  - FWS 1999: Fishery Injury Determination
  - FWS 1999: Surface Water Injury Determination
  - USGS 1999: Lake Trout Injury Study
  - USGS 1999: Lake Trout Injury Study
  - FWS 1999: Walleye Injury Study
  - FWS 1998: Fish Consumption Advisory Study
  - Barron et al. 2000 (J. Great Lakes Research)
Aquatic Injuries

- Findings
  - Fish consumption advisories in all sport fish throughout Fox River and Green Bay
  - Pre-cancerous lesions in Green Bay walleye from PCBs
  - Reproductive failure in lake trout from thiamine deficiency, not PCBs
Aquatic Injuries: FCAs
Aquatic Injuries: Walleye Tumors

![Bar chart showing the percentage of fish with tumors or pre-tumors and PCB concentration in the Assessment Area and Reference Area. The chart indicates a higher percentage of fish with tumors or pre-tumors in the Assessment Area compared to the Reference Area.](chart.png)
Aquatic Injuries: Lake Trout Thiamine

![Graph showing the relationship between Thiamine concentration in unfertilized eggs (pmol/g) and % Fry Mortality. The graph indicates a negative correlation, with higher Thiamine concentrations associated with lower % Fry Mortality.]
Aquatic Injuries: Lake Trout Fieldwork
Bird Injury

- Publications
  - FWS 1999: Bird Injury Determination
  - Carey et al. 1998 (Pellston Workshop)
  - Matteson et al. 1999 (Symposium)
  - Dykstra et al. 2001 (J. Great Lakes Research)
  - Dahl et al. 2001 (Ecotoxicology)
  - Dykstra et al. in press (Ecovision World Monogr. Series)
Bird Injury

- Findings
  - Waterfowl consumption advisories due to PCBs
  - Reproductive failure in terns, cormorants, eagles due to PCBs
  - Deformities and behavioral abnormalities in terns due to PCBs
  - Deformities in cormorants not explainable
  - DDE also cause of reproductive failure
Bird Injury: Bald Eagle Productivity

Bald Eagle Productivity in Wisconsin

Source: Wisconsin DNR.
Bird Injury: Cormorant Fieldwork
Bird Injury: Tree Swallow Fieldwork
Bird Injury: Eagle Fieldwork
Economics

- Publications
  - FWS 1998: Recreational Fishing Damages Study
  - FWS 2000: Total Value Equivalency Study
  - FWS 2000: Restoration and Compensation Determination Plan
  - Breffle and Rowe 2002 (*Land Economics*)
  - Breffle et al. Forthcoming (book chapter)
  - Lazo et al. Forthcoming (book chapter)
Economics

Findings
- Recreational fishing damages: $106-148 million
- Total damages: $176-333 million
- Restoration costs less than willingness-to-pay
- Recreational facilities worth less than habitat
Economics: Damage Categories

Baseline

Past Damages

Interim Damages

Restoration Path

Residual Future Damage

Injury

Now

End of Restoration

Stratus
Economics: Consumption Advisories
Economics: Use and Enjoyment
Economics: Economist
Major Conclusions About Open Process

- Prevented quick and ineffective deal by FRC
- Leveraged EPA $Fund into the process
- Resulted in press support (multi-year process)
- Resulted in local public support (multi-year process)
- Explained differences between cleanup and full compensation for decades of injuries
- Advanced the state of science on several fronts
- Prepared for litigation
- $85M in settlements (and counting)