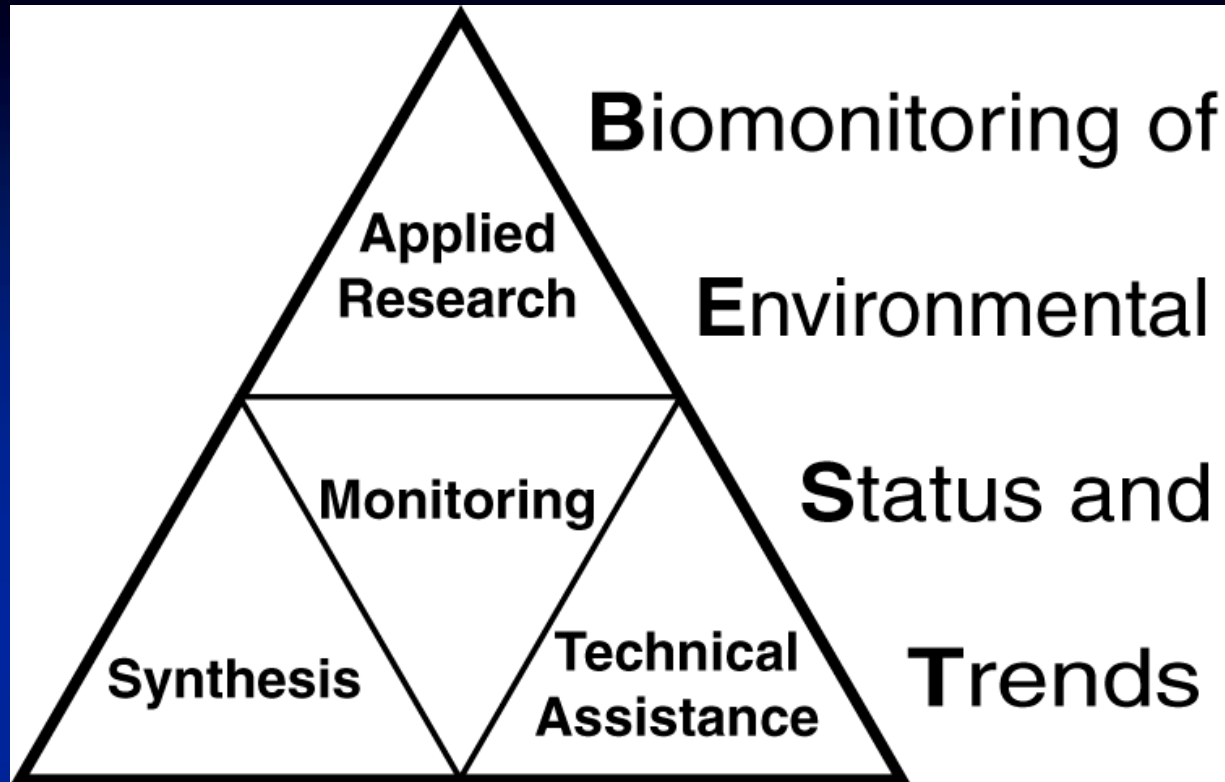




Use of the Contaminant Exposure and Effects-- Terrestrial Vertebrates Database to Rank Ecotoxicological Data Gaps

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The BEST program seeks to monitor, identify, and understand the effects of environmental contaminants on the Nation's biological resources, particularly those under DOI stewardship.

Retrospective Monitoring

- **Predictive information obtained through review of existing temporal, geographic and phylogenetic ecotoxicological data**
- **Passive but labor intensive activity**
- **Emphasis on lands and species under DOI stewardship**



Data Compilation

Who: Amphibians, Reptiles, Birds and Mammals

What: Contaminant Exposure and Effects Data

When: 1938 to present

Where: Atlantic, Gulf, Pacific Coasts, Alaska
and Hawaii

How: Computerized Literature Searches
“Gray” Literature
Letters of Solicitation
Telephone Inquiries
Electronic Database Searches

Contaminant Exposure and Effects- Terrestrial Vertebrates Database

“CEE-TV”

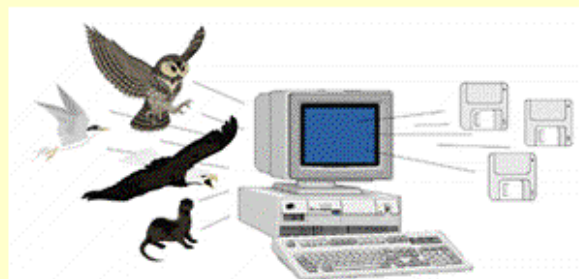
Compile information in Microsoft Access

Preference for “summary data” rather than “raw data”

Used standardized concentrations units whenever possible

**Geo-referenced all data (USGS Geographic Names
Information System, DeLorme MapExpert)**

WWW.PWRC.USGS.GOV/CEETV



Contaminant Exposure and Effects--Terrestrial Vertebrates (CEE-TV) Database

The Biomonitoring of Environmental Status and Trends (BEST) program is designed to assess and monitor the effects of environmental contaminants on biological resources, particularly those under the stewardship of the Department of the Interior. BEST examines contaminant issues at national, regional, and local scales, and uses field monitoring techniques and information assessment tools tailored to each scale. As part of this program, the threat of contaminants and other anthropogenic activities to terrestrial vertebrates residing in or near to Atlantic and Gulf coast estuarine ecosystems is being evaluated by data synthesis and field activities. One of the objectives of this project is to create a database of contaminant exposure and effects for terrestrial vertebrates residing on the Atlantic and Gulf Coasts.

For the Atlantic and Gulf Coast regions, the "Contaminant Exposure and Effects--Terrestrial Vertebrates" database (CEE-TV) has been compiled through computerized search of published literature, review of existing databases, and solicitation of unpublished reports from conservation agencies, private groups, and universities. Summary information in the database includes species, collection date, site coordinates, estuary name, hydrologic unit catalog code, sample matrix, contaminant concentrations, biomarker and bioindicator responses, and reference source. Currently, the CEE-TV database contains approximately 6,000 records containing ecotoxicological exposure and effects information on over 150,000 individuals representing over 250 species of amphibians, reptiles, birds, and mammals residing in estuaries. The database has a number of potential applications including focusing biomonitoring efforts to generate critically needed ecotoxicological data in the numerous "gaps" along the coast, reducing uncertainty about

The database can be easily queried using taxonomic, chronologic, geographic, and contaminant search categories.

[*CEETV Search Form*](#)

CEE-TV Search Form: Atlantic and Gulf Coasts

[Go to Search Form](#)

- Enter search text for any combination of fields.
- Boxes with arrows are pull-down menus from which search text can be selected.
- Fields remaining blank in output indicate that no data were reported for that parameter.
- Combinations of terms can be used to focus the query.

Example: to search for "black duck", enter it in the Common Name field. Alternatively, enter the word "duck" and all database records containing that term, including black ducks, will appear in the output.

[Complete documentation for this database](#)

SEARCH FORM:

Taxonomic Information:

Common Name	Table of Choices
<input type="text"/>	

Genus and Species	Table of Choices
<input type="text"/>	

Family	Table of Choices
<input type="text"/>	

Order	Table of Choices
<input type="text"/>	

Class	<input type="text"/>
	Select from Pulldown

Date of Study:

Operator for Year of Study: <input type="text"/>	Year of Study (4 digit year): <input type="text"/>
--	--

Geographic Information:

State:

Specific Name of Study or Collection Site (e.g., town, island, refuge):

Name of Estuarine or Coastal Drainage Area (See [table](#) of estuary names):

USGS Hydrologic Unit (HUC) Code:

Contaminant Information:

Sample matrix that was analyzed:

The following 3 sections permit selection of a contaminant, and allow you to specify an operator and value for searches.

Example: To search for all records that contain *p,p'*-DDE values greater than 20, select the following from the pull down menus:

Contaminant: *p,p'*-DDE Operator: > Value: 20

Organochlorine Pesticides and PCBs Contaminants: Operator: Value:
Concentration Units (optional):

Dioxins and Dibenzofurans: Operator: Value:
Concentration Units (optional):

Operator for Toxic Equivalent (TEQ) Value: Toxic Equivalent (TEQ) Value: Units (optional):

Metals, Metalloids, and Trace Elements: Operator: Value:
Concentration Units (optional):

Organophosphorus, Carbamates, and Petroleum Hydrocarbons:

Evidence of exposure to: Organophosphorus Insecticide?
Carbamates?
Petroleum Hydrocarbons?

Biomarker/Bioindicator Responses:

Author or Information Source:

Other Contaminants and Miscellaneous Information ([See Table](#)):

Record No.: (This field can be used to retrieve records cross-referenced in the "Other" field.)

Search

Clear Form

Results of CEE-TV Database Search: Atlantic and Gulf Coasts

2 record(s) were found that contained your search criteria. Your criteria will be shown below in red, underlined characters.

The search for Common Name: pelican Genus/Species: Family: Order: Class: Operator-Year of Study: Year of Study: Location: State (Postal Code): Estuary: HUC: Matrix: FieldOC: OperOC: ValueOC: OC_Units: Fielddiox: Operdiox: Valuediox: D_F_Units: Operteq: Teqvalue: TEQ_Units: Fieldmetl: Opermetl: Valuemetl: Metal_Unit: organophos: carbamates: Oil: yes Biomarker: Reference: Other: Record No.:

returned the following:

Codes: -2 = not detected
 -1 = trace amounts detected
 * = exact location not given

Following Record is for Brown Pelican:

Common Name:	Brown Pelican	Record No.:	170029	Genus/Species:	<i>Pelecanus occidentalis</i>
Family:	Pelecanidae	Order:	Pelecaniformes	Class:	Aves
Year From:	1995	Year To:	1995	Location:	Pascagoula
State:	MS	Estuary:	East Mississippi Sound	HUC:	3170006
Latitude:	N30°21'56"	Longitude:	W88°33'57"	Matrix:	
Sample Size:	126				

PETROLEUM HYDROCARBON	yes
Other	unknown source discharge into Pascagoula River; 126 Brown Pelicans retrieved and 113 released
REFERENCE:	<u>Tri-state Bird Rescue and Research, 1997</u>

Codes: -2 = not detected

-1 = trace amounts detected

* = exact location not given

Following Record is for Bald Eagle:

Common Name: **Bald Eagle** Record No.: **10004** Genus/Species: *Haliaeetus leucocephalus*
Family: **Accipitridae** Order: **Falconiformes** Class: **Aves**
Year From: **1969** Year To: **1969** Location: **Franklin**
State: **ME** Estuary: **Coastal Drainage Area** HUC: **1050002**
Latitude: **N44°35'17"** Longitude: **W68°13'41.7"** Matrix: **egg content**
Sample Size: **1**

p,p'-DDE	11.86
p,p'-DDD	0.55
p,p'-DDT	0.24
DIELDRIN	0.22
HEPTACHLOR EPOXIDE	0.02
Total PCBs	4.9
OC Units	ug/g
MERCURY	0.3
METAL Units	ug/g
BIOMARKER	Eggshell Thickness
BIOMARKER Value	11% decrease
Other	Biomarker data from Franklin, Dyer Neck, and Boyden Pond
REFERENCE:	Wiemeyer et al., 1972

Following Record is for Snapping Turtle:

Common Name: **Snapping Turtle** Record No.: **70088** Genus/Species: ***Chelydra serpentina***
 Family: **Chelydridae** Order: **Testudines** Class: **Reptilia**
 Year From: **1981** Year To: **1982** Location: **Hackensack Meadowland**
 State: **NJ** Estuary: **Hudson River/Raritan Bay** HUC: **2030103**
 Latitude: **N40°53'13.9"** Longitude: **W74°02'11.8"** Matrix: **adipose**
 Sample Size: **3**

p,p'-DDE	0.26
p,p'-DDD	-2.0
p,p'-DDT	-2.0
DIELDRIN	-2.0
HEPTACHLOR EPOXIDE	-2.0
OXYCHLORDANE	2.12
cis-CHLORDANE	0.12
trans-NONACHLOR	0.93
cis-NONACHLOR	0.64
TOXAPHENE	-2.0
ENDRIN	-2.0
Total PCBs	34.07
OC Units	ug/g
BIOMARKER	ALAD activity
BIOMARKER Value	113.50
Other	trans-chlordane=nd; From females from brackish water
REFERENCE:	Albers et al., 1986

Codes: -2 = not detected

-1 = trace amounts detected

* = exact location not given

CEE-TV “Meta Data”

Atlantic, Gulf and Pacific Coasts, Alaska and Hawaii

Total number of records: 11,085

Individuals per record: 1 to 37,590

Total Individuals: ~250,000

Total number of species represented: 450

19.5% Mammals

76.3% Birds

3.8% Reptiles

<0.5% Amphibians

Sample matrices studied: 49

Contaminant Trends

DDE, DDD and DDT 45% records

**Ah-receptor active PCB Congeners
+ Dioxins + Dibenzofurans** 2 % records

Hg 22 % records

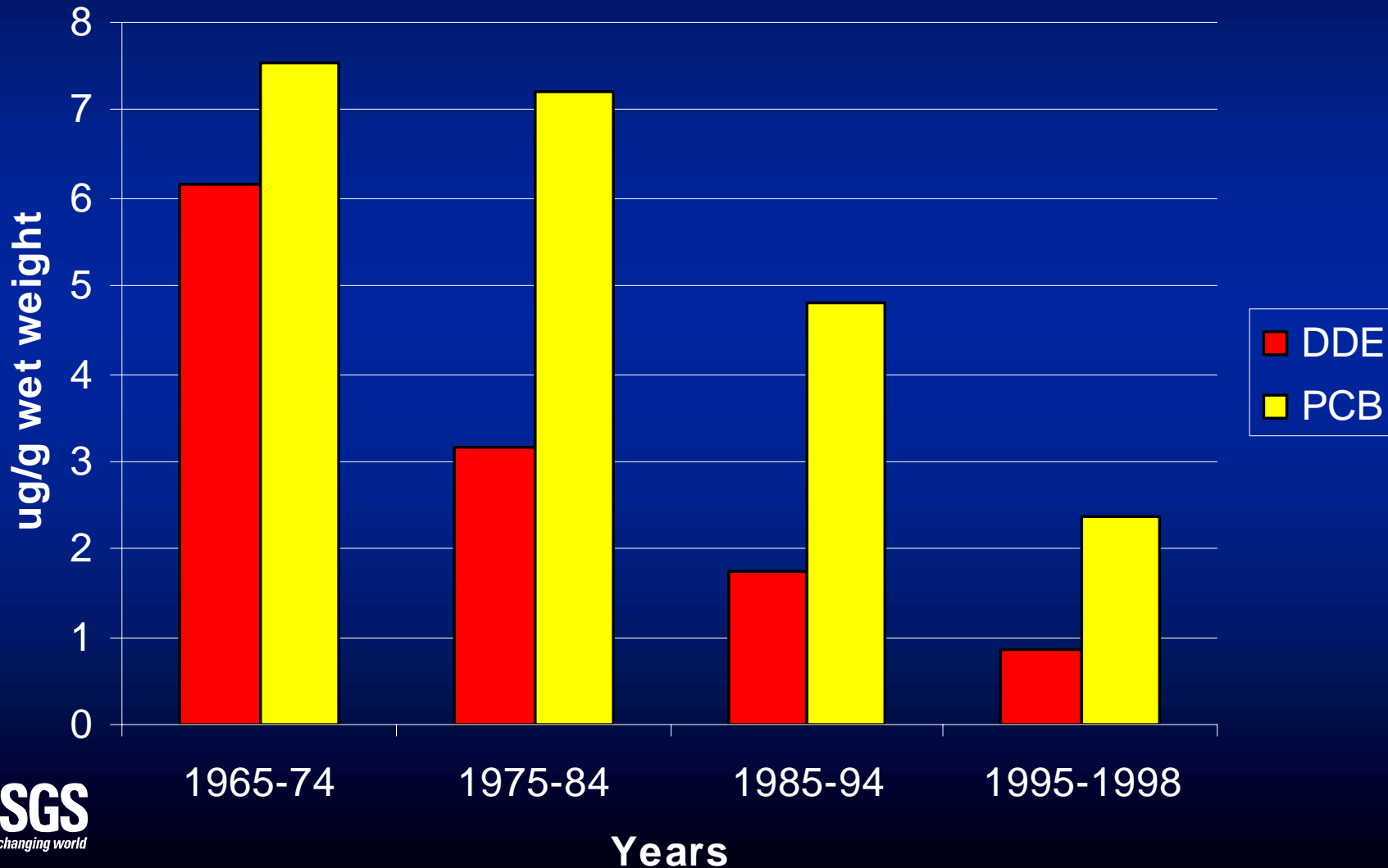
Pb 20% records

Biomarker/bioindicator responses 12 % records

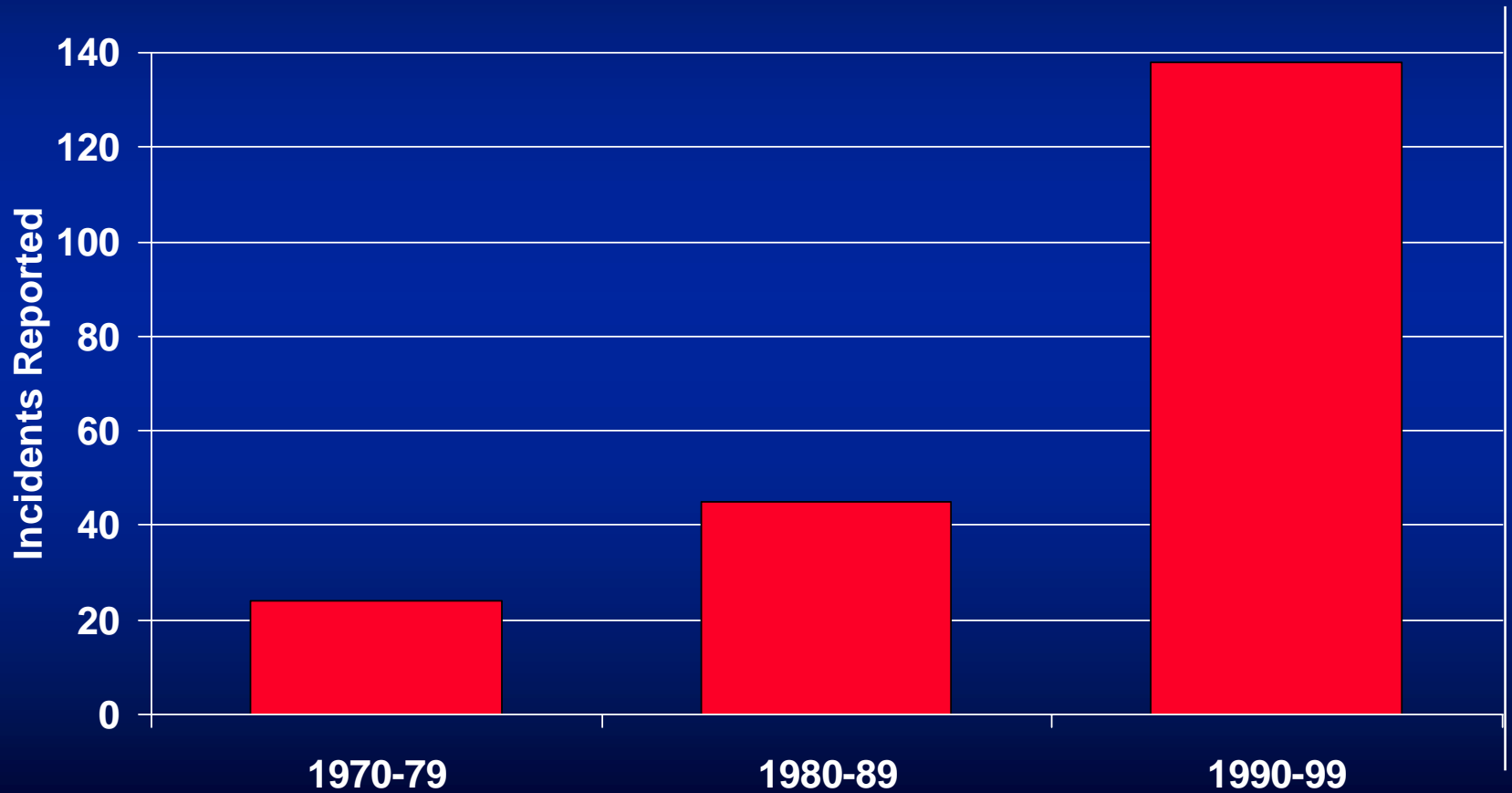
Toxic Substances Control Act	75,500
Food Quality Protection Act	
Pesticides	900
Inert ingredients	2,500
Foods and Drug Act	8,000
Totals cmpds/subs in commerce	86,900

< 0.2% (166 of 86,900) are “found” in CEE-TV records
< 1% (781 of 86,900) are “measured” in fish and wildlife

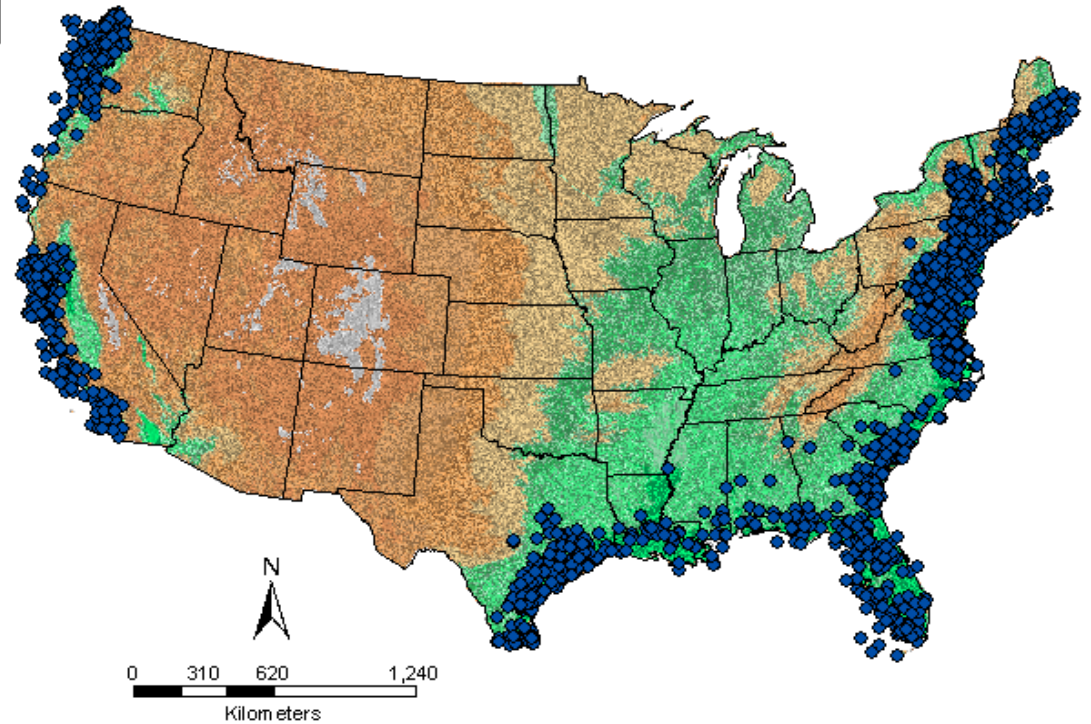
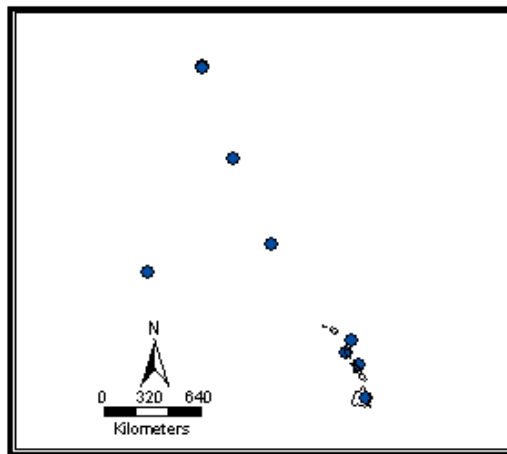
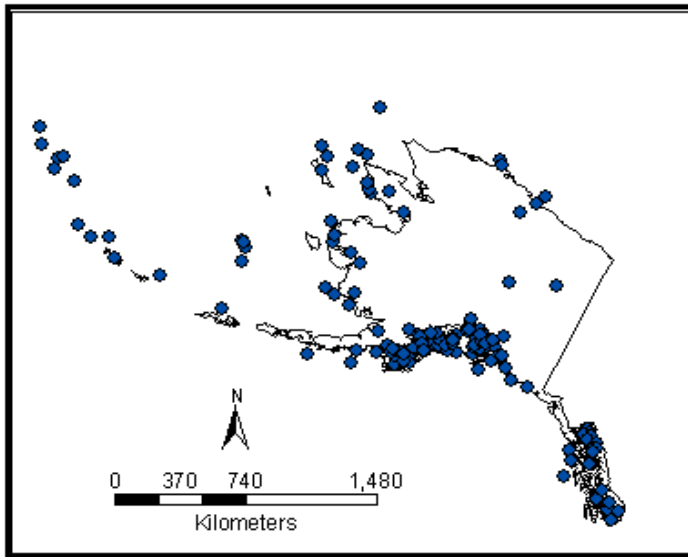
DDE and PCB in Osprey Eggs on the Atlantic Coast, 1967-1998



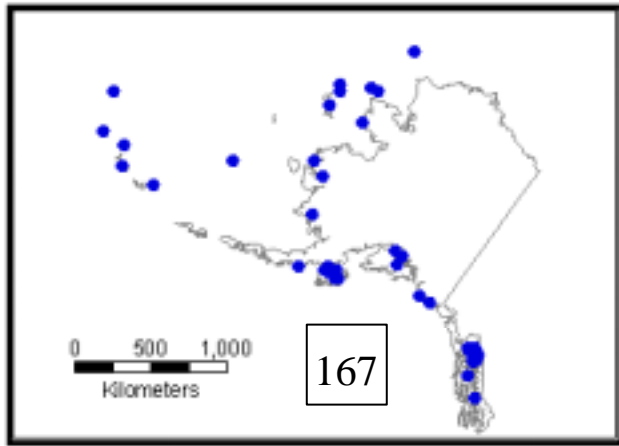
Reported Incidence of Organophosphorus and Carbamate Exposure



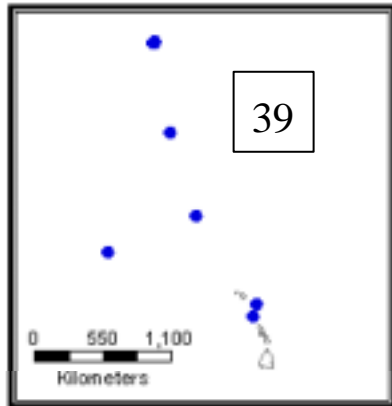
Plot of CEE-TV Records



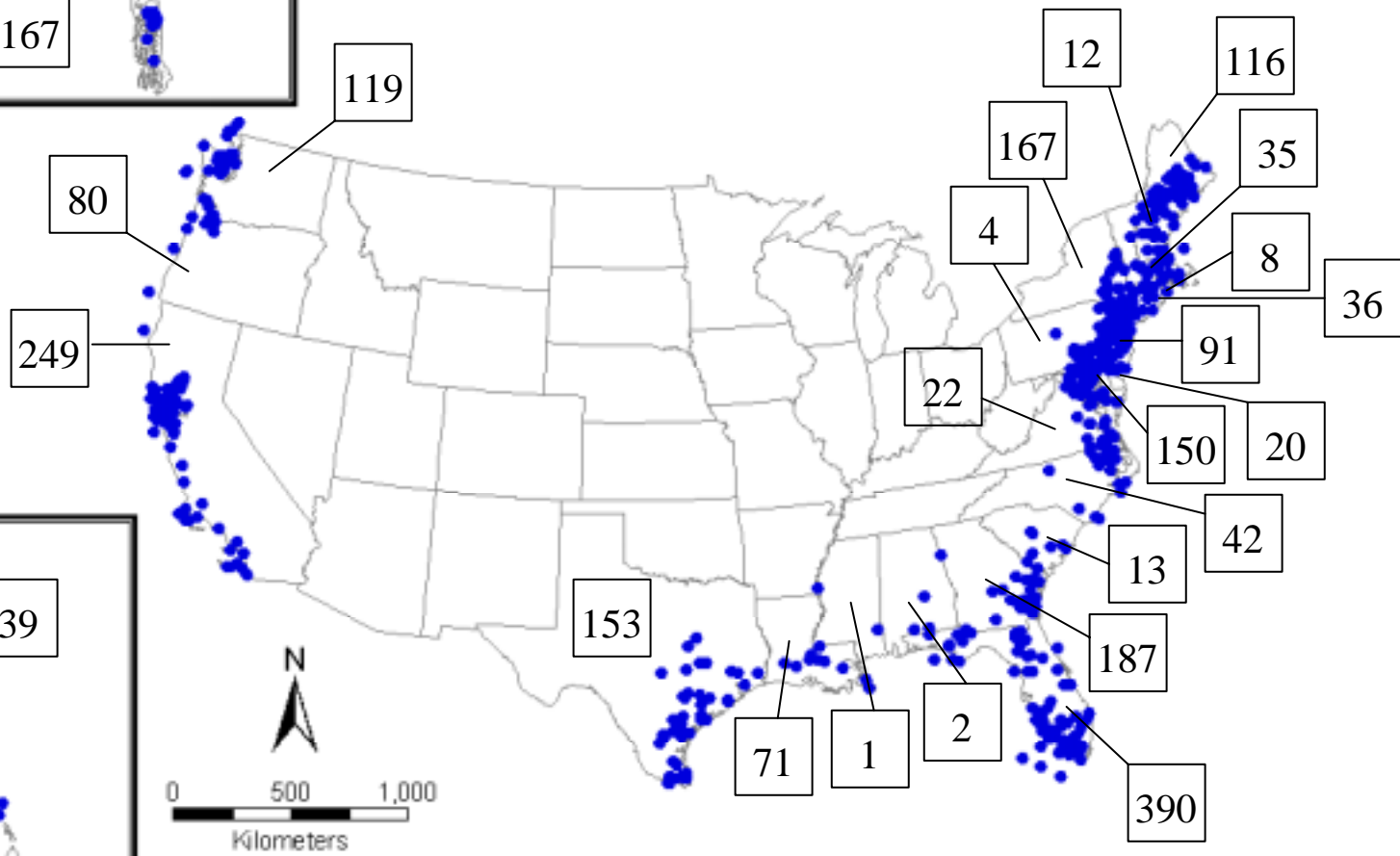
Geographic distribution of Hg records in the CEE-TV database



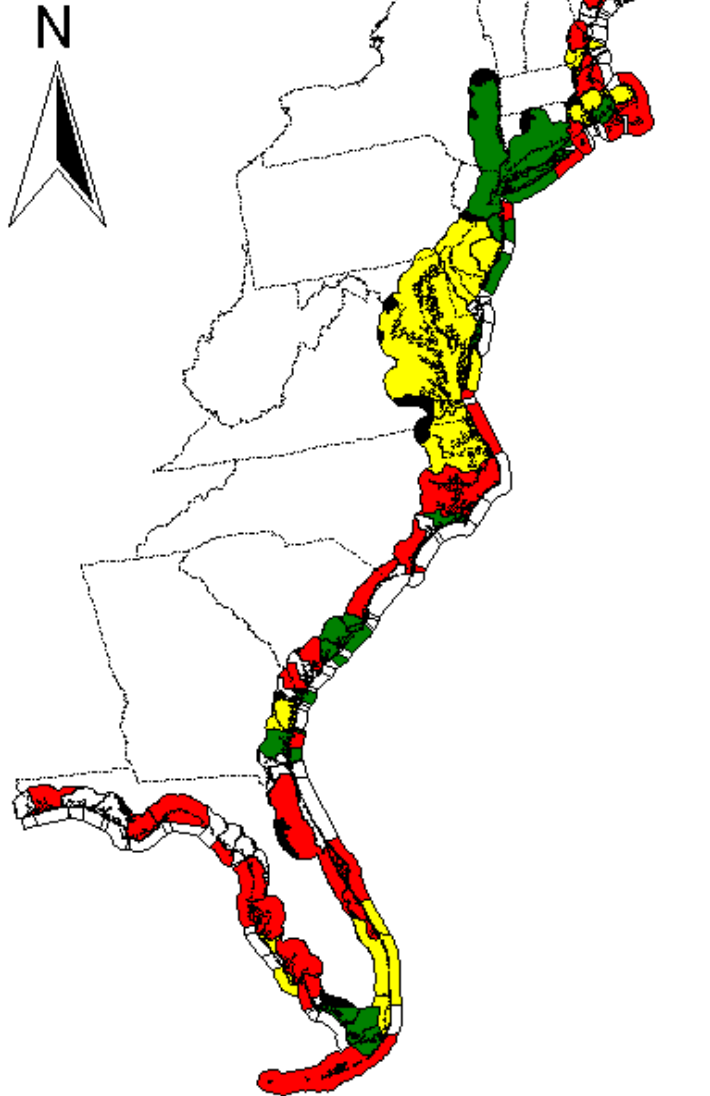
167



39



Distribution of CEE-TV Records within estuarine and coastal drainage areas, 1965 - 1997



1 CEE-TV Record / X sq km



0



> 260



130 - 260

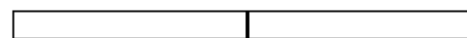


< 130

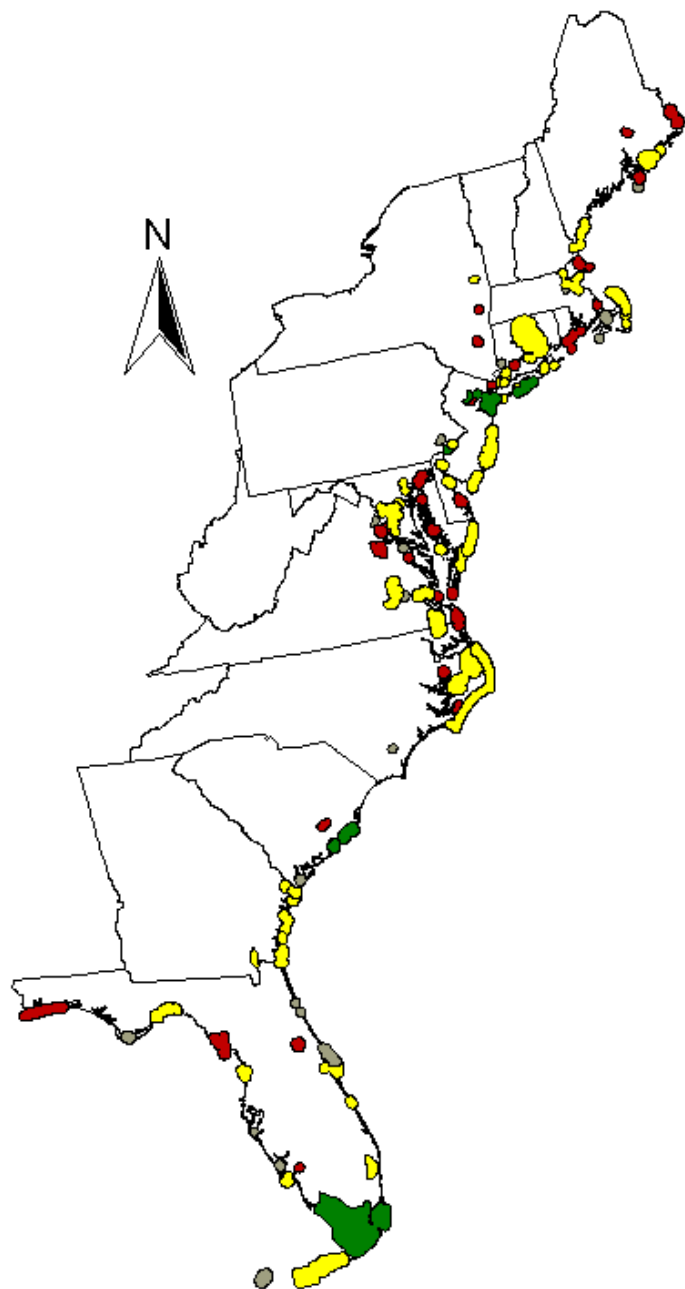






Fluvial Drainage Area

0 500 1000 Kilometers



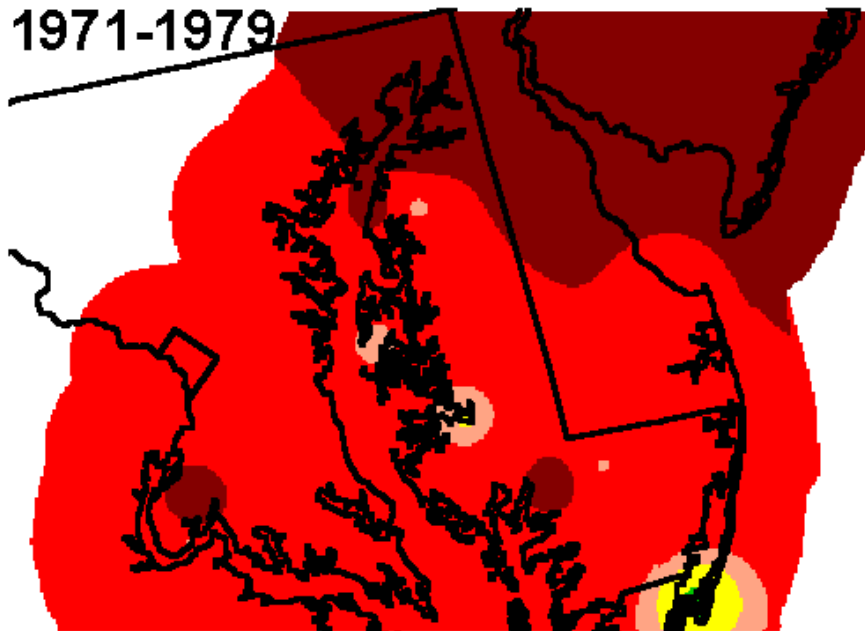
CEE-TV records within 10 km of national wildlife refuges and national parks



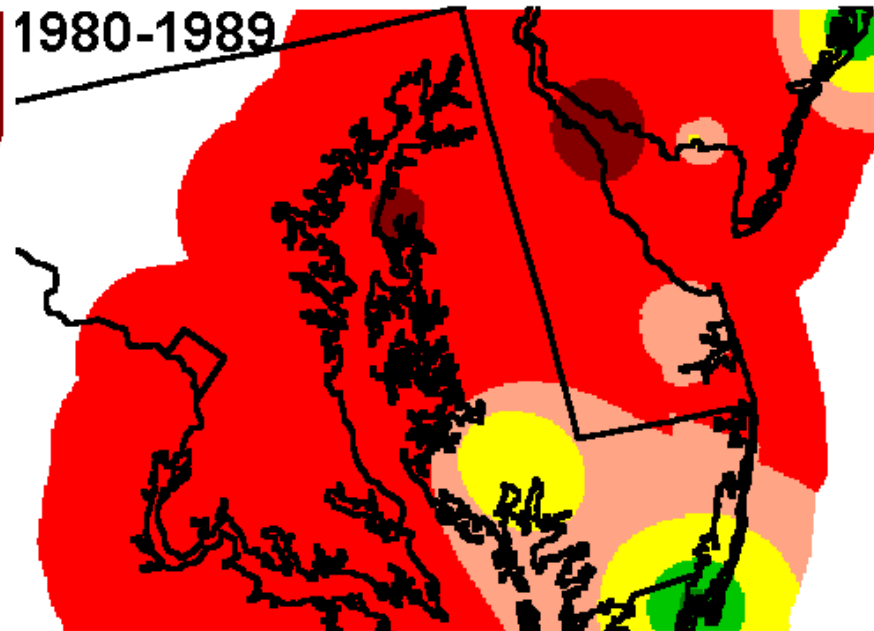
LEGEND	
# CEE-TV Records	
	0
	1 - 5
	6 - 50
	> 50

0 500 1000 Kilometers

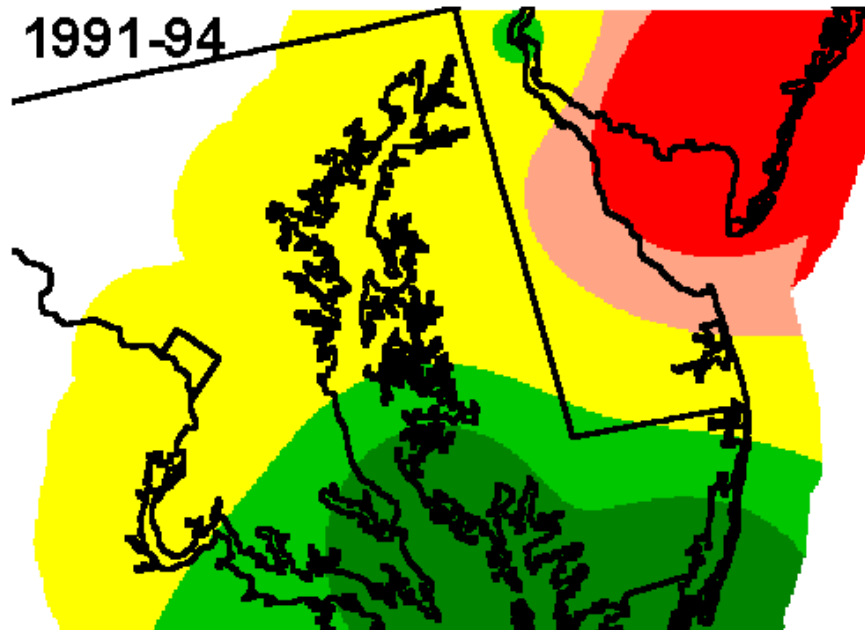
1971-1979



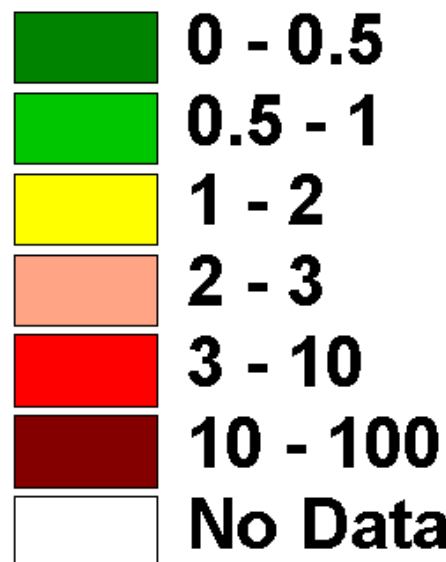
1980-1989



1991-94

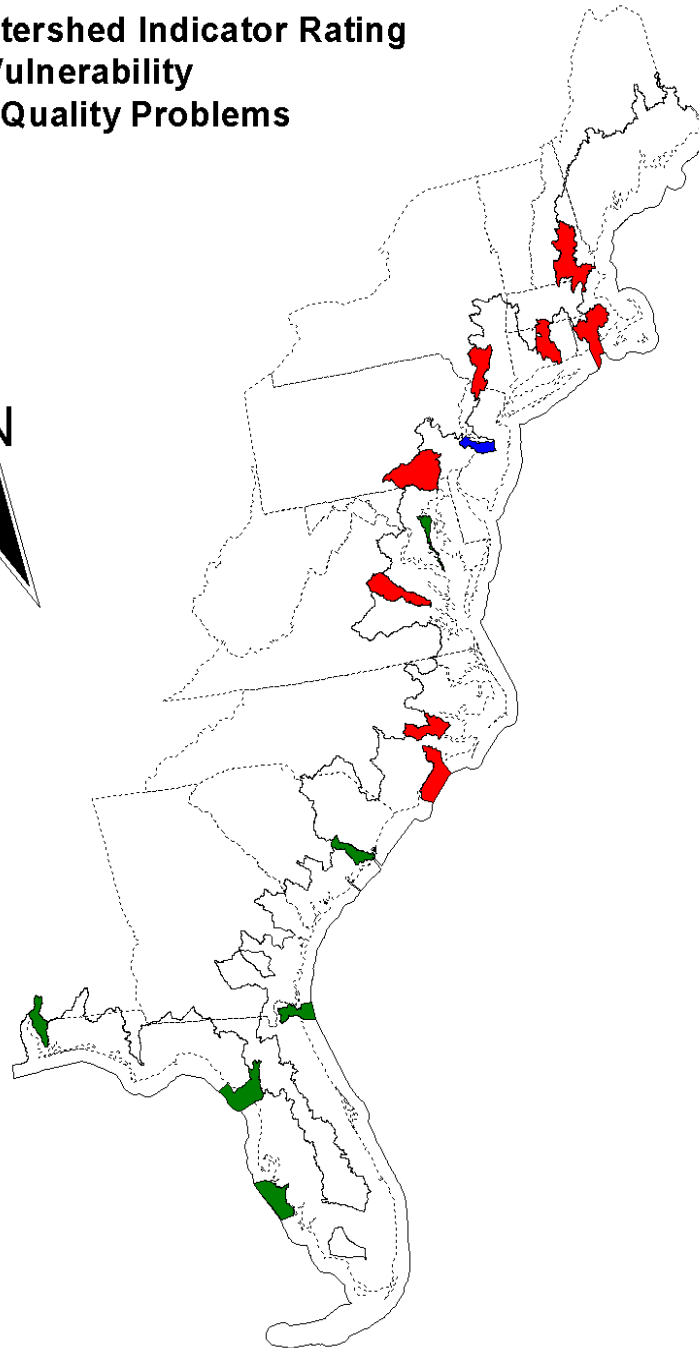


[DDE] in Bird Eggs

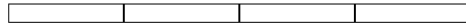


Index of Watershed Indicator Rating

- High Vulnerability
- Water Quality Problems
- Both



0 250 500 750 1000 Kilometers



Conclusions

- 1. Only have data near 50% FWS properties**
- 2. Only have data near 27% NPS properties**
- 3. No CEE-TV data for the Rachel Carson NWR that extends into 4 estuarine drainages**

4. Largest sites for which there are no data:

Lower Suwannee NWR, FL

Cedar Island NWR, NC

Back Bay NWR, VA

St. Vincent NWR, FL

Crocodile Lake NWR, FL

Dry Tortugas National Park, FL

Canaveral National Seashore, FL

Assateague Island National Seashore, MD

Prince William Forest Park, VA

George Washington Memorial Parkway, VA

- 5. No geographically and temporally consistent ecotoxicological assessment for entire coast**
- 6. 3 Refuges and 6 Parks within 10 km of NPL Superfund Sites for which there are little or no ecotoxicological data**
- 7. Dozen NWRs and NPs for which we have little or no CEE-TV data that occur in estuaries that have commercial fishing bans or stringent F&W consumption advisories**