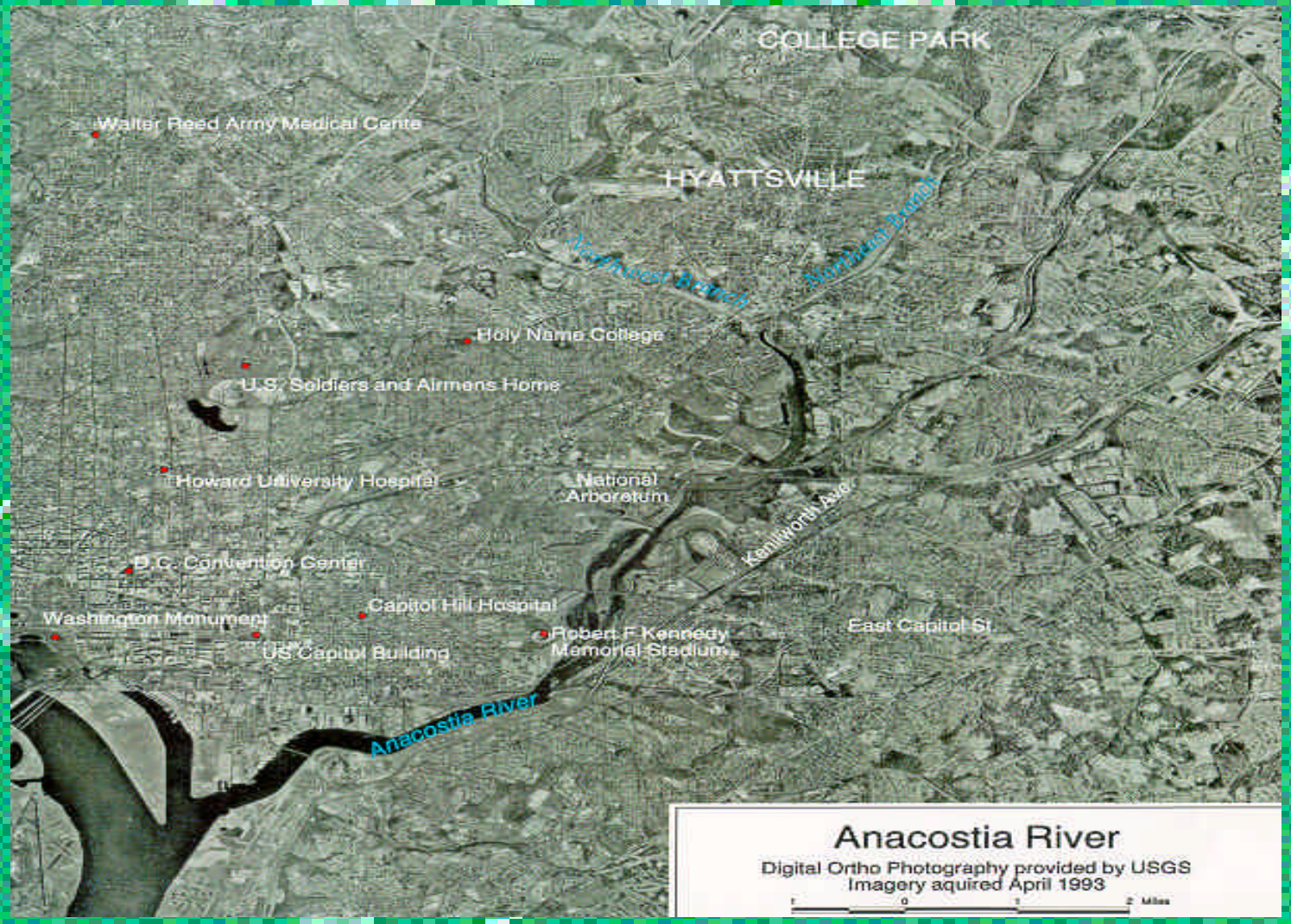
Anacostia Watershed Toxics Alliance

Rapid Assessment Efforts



Michael Buchman (in absentia) with Cooperation from AWTA Members

Outline

- Provide background on the Anacostia
- Present AWTA's 3 Phased Approach
- Describe Use and Purpose of Rapid Assessment Techniques

MAJOR ENVIRONMENTAL PROBLEMS IN ANACOSTIA AREA

- **Nonpoint source runoff**
- **CSO problems**
- **Contaminated/Unhealthy Fish**
- **Loss of wetlands and natural habitat for fish**
- **Toxic contamination of sediments**

AWTA's Objective

- Address the toxic contamination of sediments in the Anacostia River;
- Identify and quantitatively assess risks;
- Build partnerships among AWTA members;
- Use CERCLA guidelines when taking actions;
- Assess current toxics loading and conduct scientific investigations;
- Share analytical data with all other parties/efforts;
- And, conduct reasonable, risk-assessed remediations of the watershed under AWTA.

Who's Involved

Army COE

ANSP

ATSDR

Bolling AFB

FWS

GSA

ICPRB

LANTDIV

Montgomery Co.

MDE

NDW

EPA

NOAA

NPS

NRL

P.G. Co.

PEPCo

Riverkeeper

UDC

WASA

Wash. COG

WGL

WMATA

What is AWTA's Approach

- Foster a cooperative effort among all Anacostia stakeholders;
- Avoid duplication of efforts by identifying what's already been done and what still needs to be done;
- Subscribe to an informal approach for doing business;
- Conduct internal and external peer reviews;
- Solicit public comments for decision documents;
- And, using both public and private monies from Alliance members, complete the AWTA effort in three (3) phases.

PHASES

	Planned Start	Begin	Completed
Phase 1 -	**6/99**	**11/99**	**4/00**

Phase 1 is to gather all available data, identify data gaps, prepare site map, & perform preliminary risk assessments.

Phase 2 -	**2/00**	**5/00**	**8/01**

Phase 2 will fill in data gaps, assess fate and transport of contaminants, perform risk assessments, & identify potential remedial actions.

Phase 3 -	**1/01**	**3/01**	**????**

(Phase 3 will identify and implement reasonable remedial actions necessary to effect restoration of the river, e.g. source control, & wetland and sediment restoration.)

Phase 1- Compilation and Evaluation of Current Data (1990-2000)

- Surface Sediment Chemistry
  20 studies with surface sediment analytical results
  - 395 stations:
  - 258 plus total samples among all 20 studies;
- Tissue Residue Analyses
  9 studies
  29 stations with 11 in the lower Anacostia system and 1 in WA Channel
  282 total samples among all studies with results from 14 species within the Anacostia system

Phase 1- Compilation and Evaluation of Current Data (1990-2000)

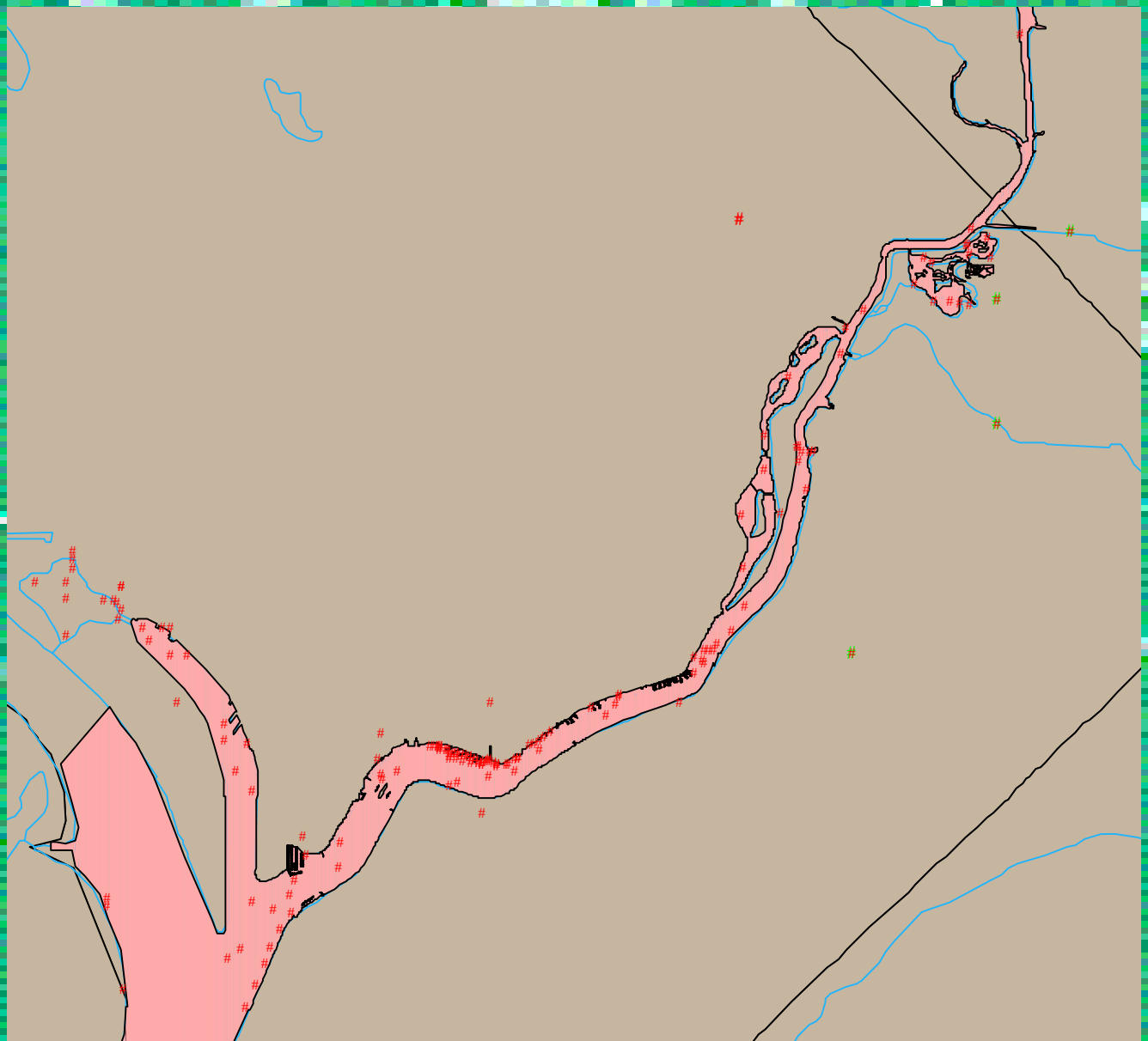
- Sediment Bioassays
  - 5 studies
  - 18 stations with 12 in the Anacostia, 4 in WA Channel/Tidal Basin
  - There are 3 different endpoints with results for 33 separate tests
- Benthic Community Analyses
  - 5 studies
  - 153 stations with 93 in the Anacostia watershed
- Performed preliminary risk assessments

Phase 1- Early Identification of Data Gaps

Early analysis suggested:

- Poor spatial/temporal distribution of samples throughout the river
- Lack of characterization of some suspected source/release points
- Most samples clustered in a few locations

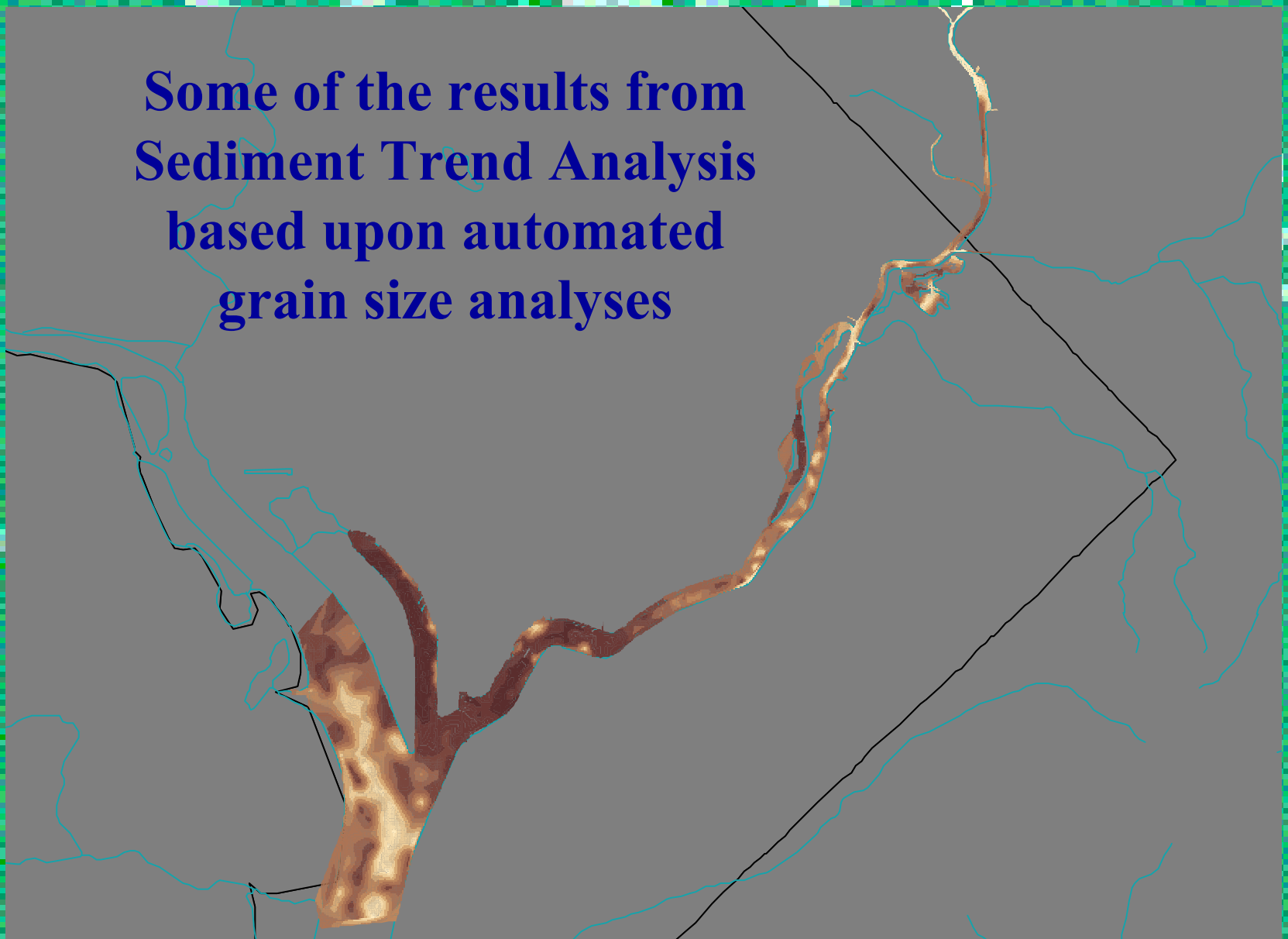
Existing Sediment Sampling Locations



Phase 2 Studies Being Proposed Included:

- Sediment Trend Analysis – first high-density characterization of sediment grain size and transport for the entire river
- Real-time Conventional Water Quality, and Water-borne Contaminants of Concern Studies – for use in calibration of models
- Spatial Distribution of Sediment Contaminants Study – 100 + stations by immunoassay
- Sediment Quality Triad Study – 120+ grab samples for full lab analyses

Grain Size Distribution

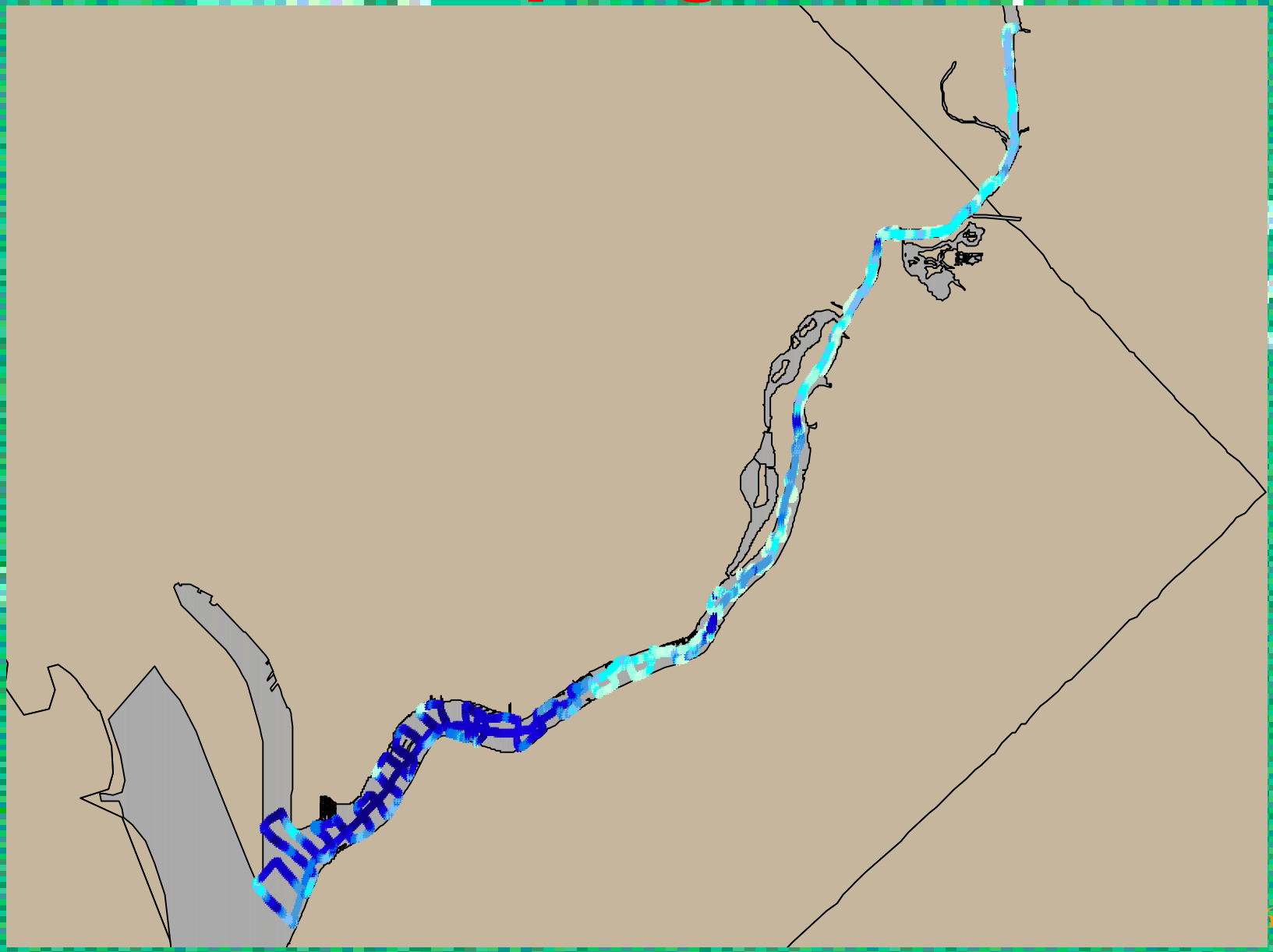


Sampling/Analysis Platform

MESC Parameters

Parameter	Units	Measured	Derived	Frequency (s^{-1})
Local time	decimal hours	x		4
Latitude	decimal degrees	x		2
Longitude	decimal degrees	x		2
Ship velocity	$m \cdot s^{-1}$	x		2
Relative wind velocity	degrees, $m \cdot s^{-1}$	x		1
True wind velocity	degrees, $m \cdot s^{-1}$		x	1
Current velocity (full water column)	degrees, $m \cdot s^{-1}$	x		0.1
Sample pressure	decibars	x		4
Sample depth	m		x	4
Conductivity	siemens$\cdot m^{-1}$	x		4
Temperature	degrees centigrade	x		4
Salinity	psu		x	4
Density	sigma-t		x	4
Bottom depth	m	x		1
Light transmission	percent	x		4
pH	NBS	x		4
Dissolved oxygen	$mL \cdot L^{-1}$	x		4
Oxygen saturation	percent		x	4
Oil fluorescence	relative volts	x		4
Chlorophyll fluorescence	relative volts	x		4
Metals: total Cu, Pb, Cd	$ug \cdot L^{-1}$	x		0.00185
Particle size distribution (32 classes)	$mg \cdot L^{-1}$	x		0.2
PAH (41 compounds)	$ng \cdot L^{-1}$	x		Discrete
PCB (congeners)	$ng \cdot L^{-1}$	x		Discrete
Metals: total/dissolved Cu, Pb, Zn, Cd	$ug \cdot L^{-1}$	x		Discrete
Total suspended solids	$mg \cdot L^{-1}$	x	x	Discrete
Chlorophyll-*a*	$ug \cdot L^{-1}$	x	x	Discrete
Nutrients NO_3, NO_2, NH_3, PO_4, SiO_2	$umole \cdot L^{-1}$	x		Discrete
Particle size (3 classes)	$mg \cdot L^{-1}$	x		Discrete

Water Sampling Track Lines



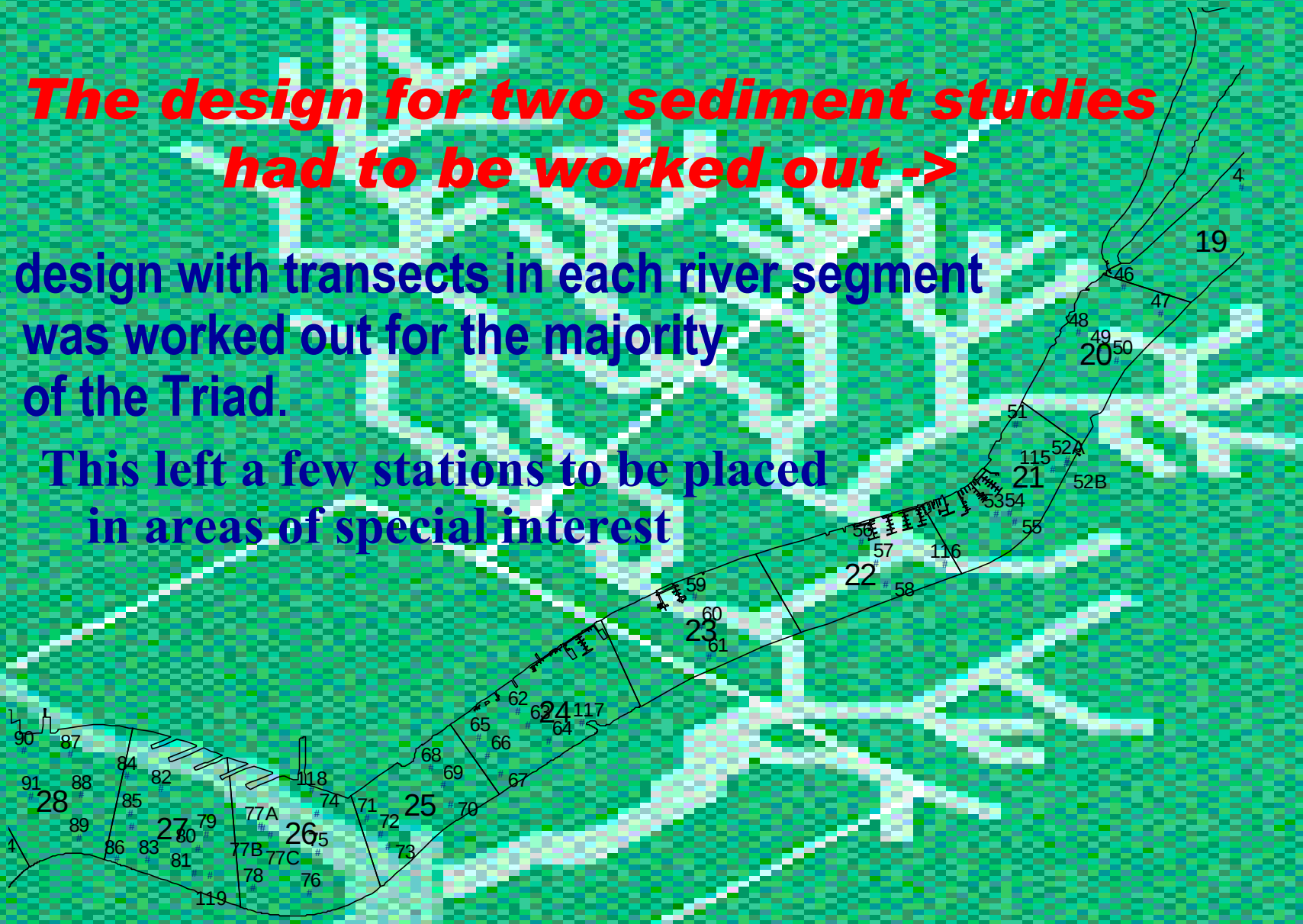
The design for two sediment studies had to be worked out ->

- Mixed funding for the Triad study partially dictated its design- it had to encompass the 35 river segments of the computer model, but had some flexibility within that constraint.
- The desire to evaluate suspected sources, preferably prior to design of the Triad, lent itself more to rapid assessment approaches

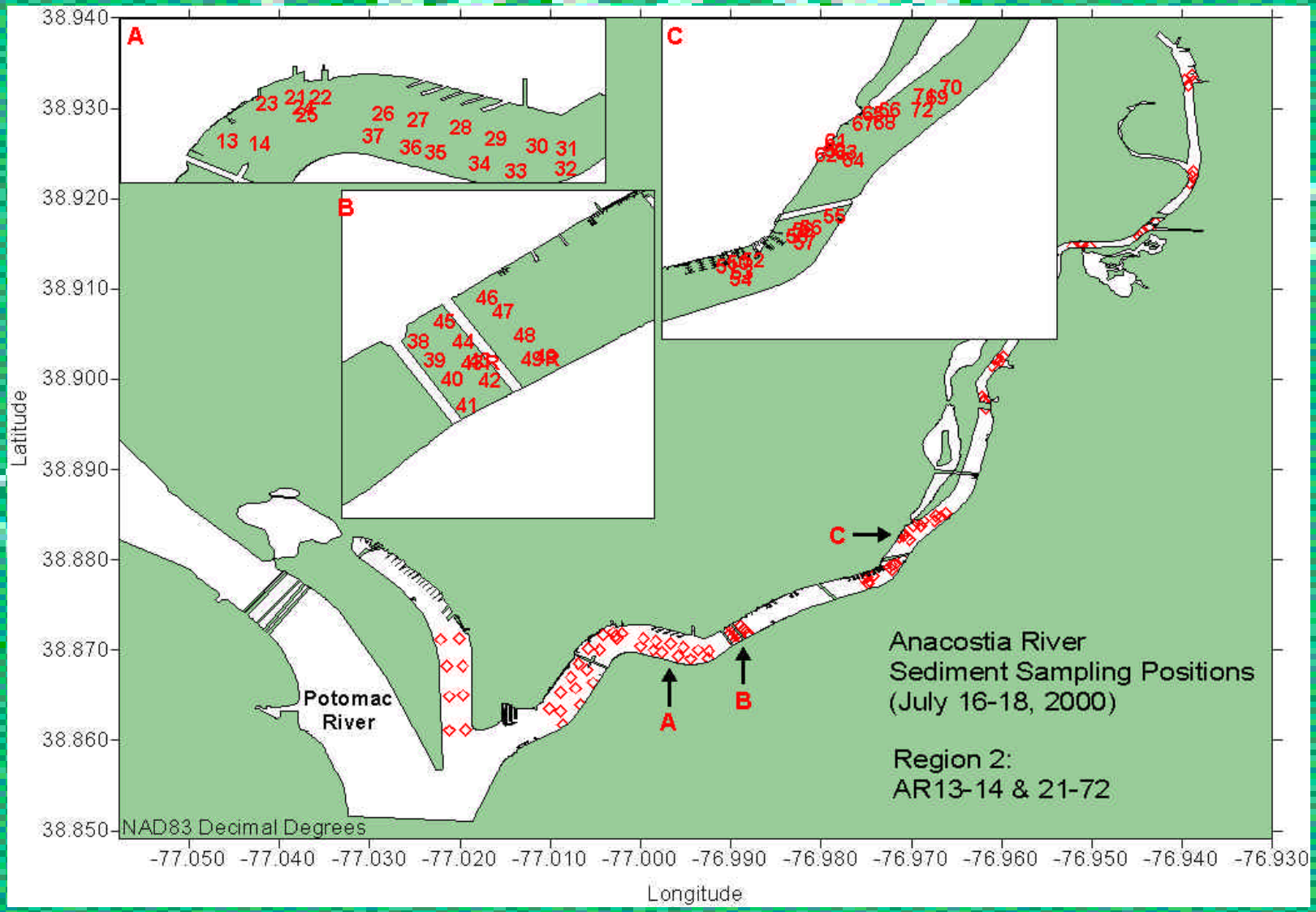
The design for two sediment studies had to be worked out ->

A design with transects in each river segment was worked out for the majority of the Triad.

This left a few stations to be placed in areas of special interest



The design for immunoassay samples could then be targeted to previously unsampled locations



Summary

Rapid Assessment Techniques were used to:

- More fully characterize the river prior to design of other field efforts (STA)
- Make full use of available technology to generate real-time water column data
- Investigate suspected sources/release points prior to more definitive chemical analyses.