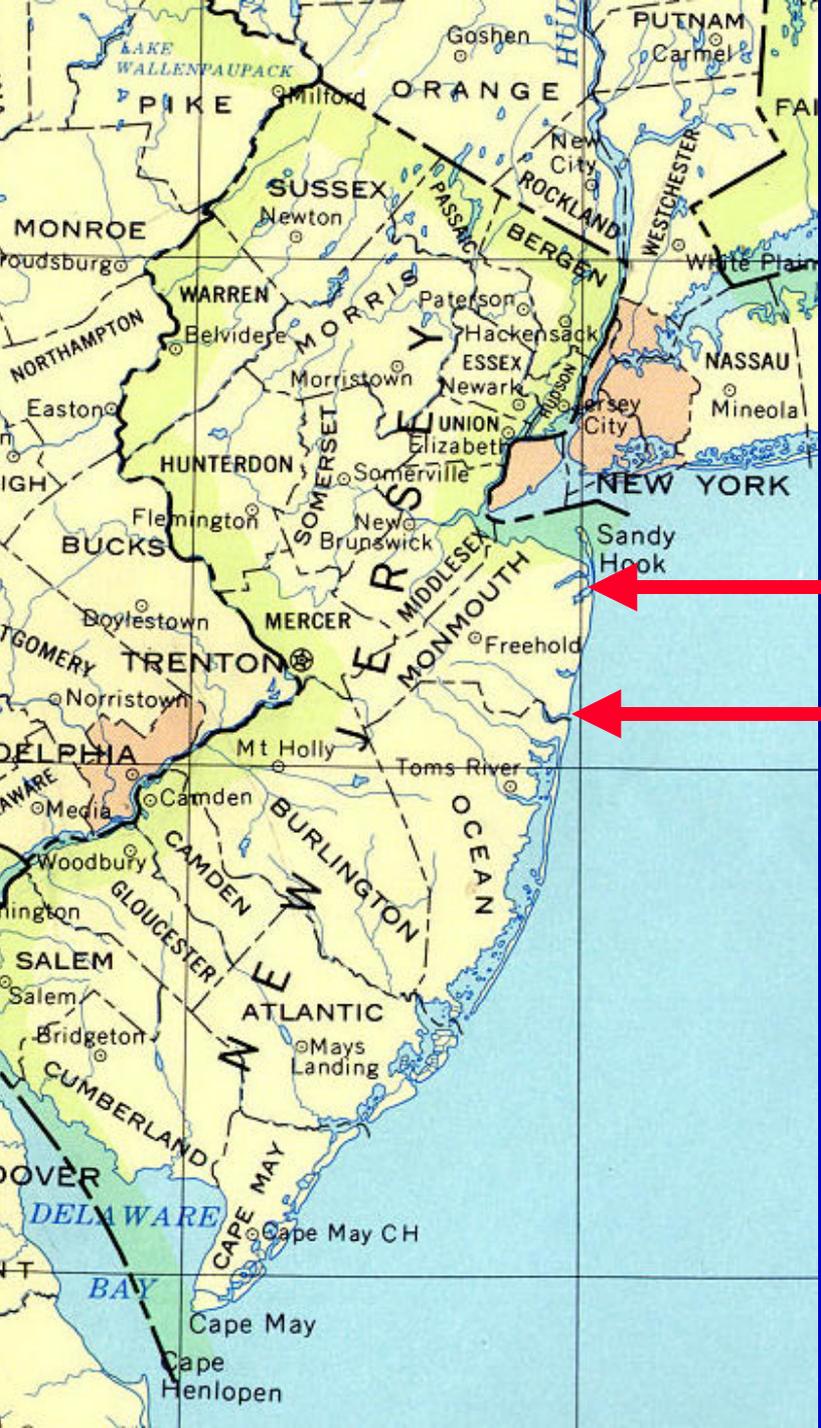


BIOLOGICAL MONITORING PROGRAM

**Beach Erosion Control Project
Atlantic Coast of New Jersey Beach
Section II - Asbury Park to Manasquan**



Project Area

Figure 1-3. Oblique aerial photograph of pre-construction beaches at the Manasquan River Inlet looking north.

Rationale for Study

- Largest nourishment (in terms of volume) to date
- No published data on beach nourishment impacts in Northeast region
- Previous studies primarily from Southeast Atlantic and Gulf of Mexico and many do not note effect size
- Very little background data on surf zone fauna in northern New Jersey

Rationale for Study

- Little direct information on connections between impacts to forage base (intertidal benthos) and surf zone fish
- No information on habitat value of surf zone for larval fish
- No information on turbidity/suspended solids plume associated with placement
- Little long-term data on impacts to borrow areas

Participating Agencies



Scoping Process

**CENAN
CEERD
USFWS
NJDEP
NMFS
USEPA**

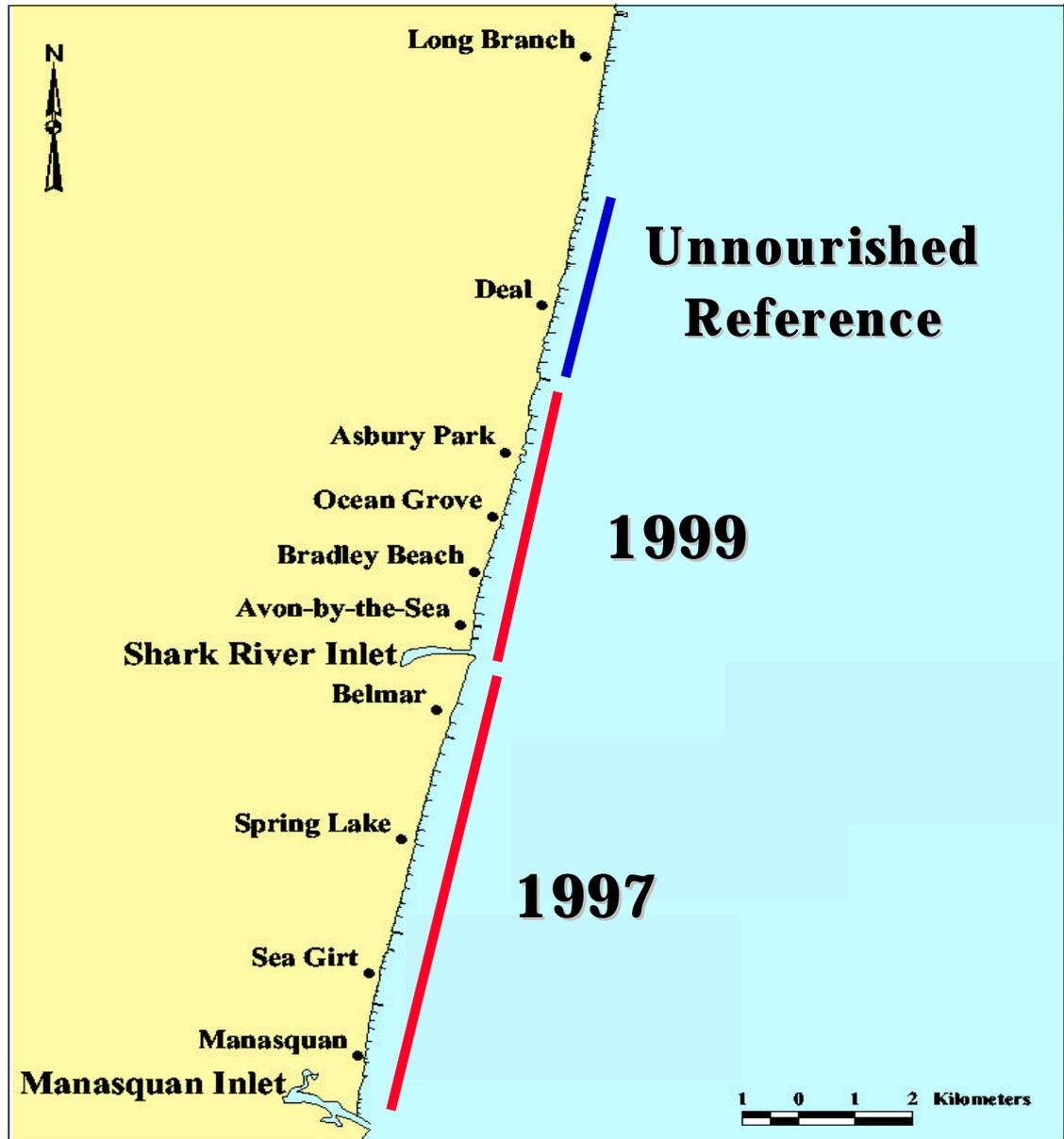
Study Partner

**CENAN
CEERD
USFWS
NJDEP
Rutgers Univ.**

7/15/199

Project Area

- Total 47 km of beach
- 19.4 mil. m³ sand
- BMP 15.9 km
- 6.2 million m³ sand
- Placement
 - 1997
 - 1999



Monitoring Components

Component

Area

Piping Plover

Beach

Suspended Sediments

Ichthyoplankton

Intertidal-Surf Zone
Nearshore

Benthos
Sediments

Fish
Food Habits
Water Quality

Offshore
Borrow Area



Monitoring Strategy

Schedule

- **1+Yr Pilot Study**
- **3 Yrs Pre-Construction**
- **2 Yrs Intensive During-Construction**
 - **1997**
 - **1999**
- **2+Yrs Post-Construction**

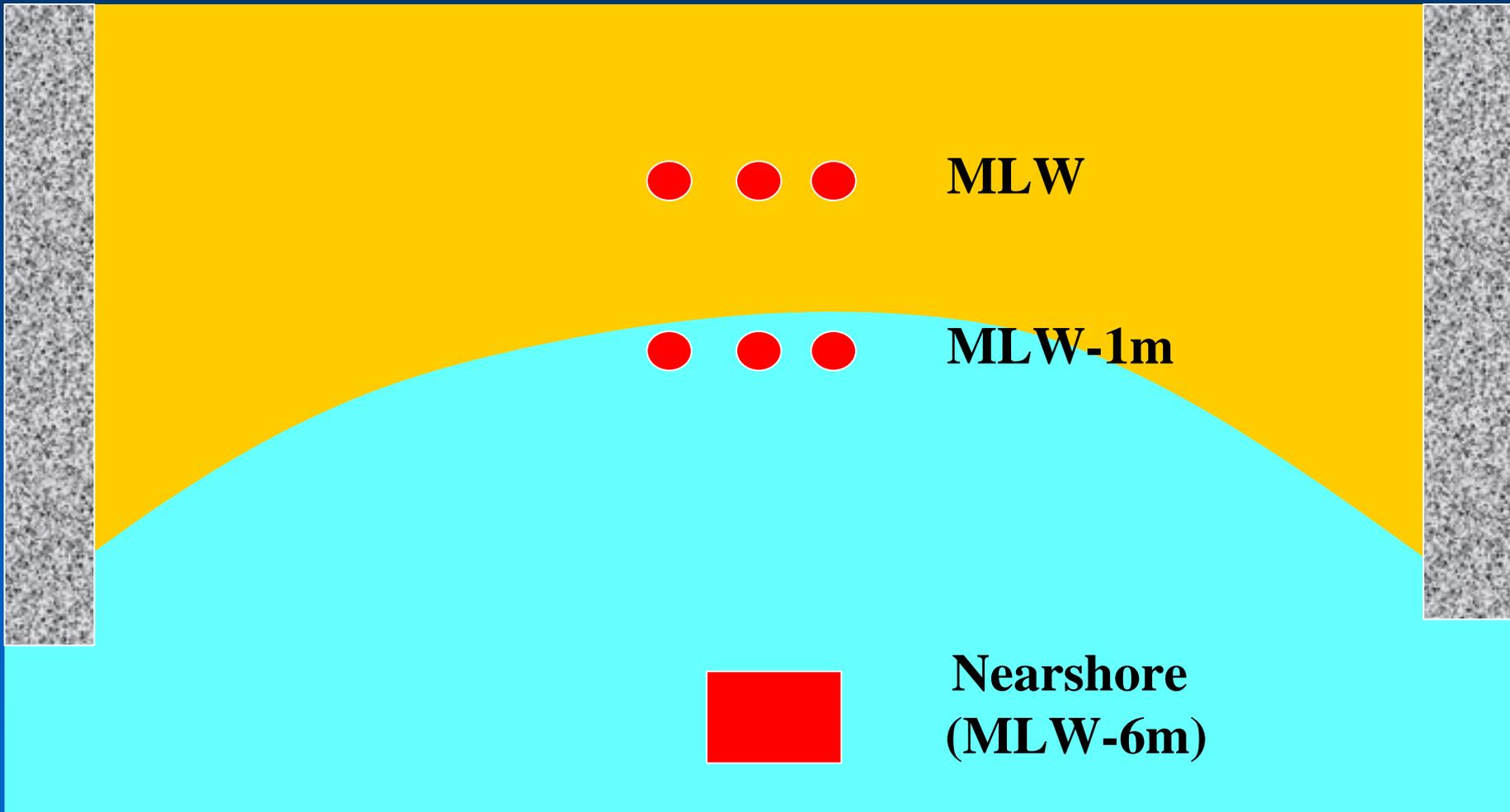
Frequency

- **Benthos & Sediments**
 - **Spring & Fall**
 - **Monthly during 1997 & 1999**
 - **Intertidal (MLW) only**
- **Fish, Fish Feeding Habits, Water Quality**
 - **Bimonthly -Summer**
- **Ichthyoplankton**
 - **Monthly Spring to Summer**

Intertidal & Nearshore Project Area



Station Positions



Intertidal and Nearshore Benthos

- Benthos similar to other Atlantic sandy beaches

- Intertidal recovery within 2-6.5 mo.

- No long-term impacts to intertidal benthos



- No impacts to nearshore in 1997

- Short-term impacts in 1999

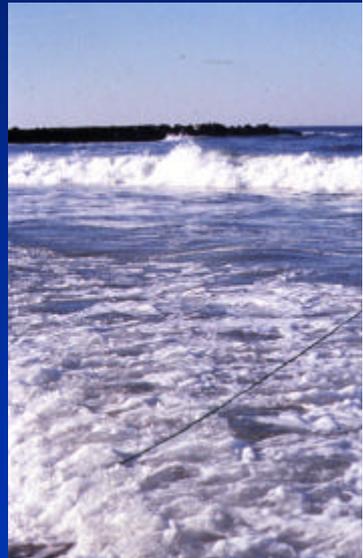
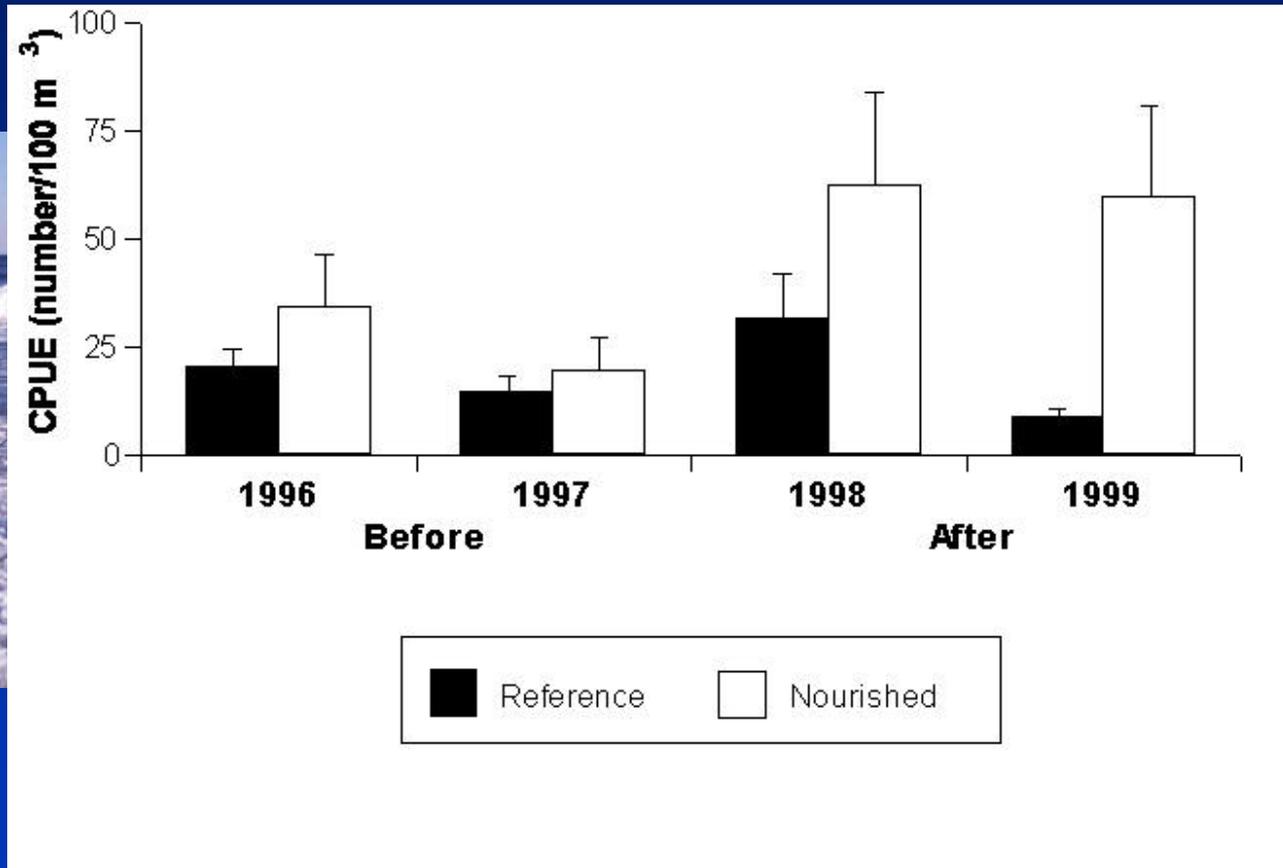
- No long-term impacts to nearshore benthos

- Ambient calm weather
TSS ~ 1 to 10 mg/L
- Ambient storm-induced
TSS 25 to >6,500 mg/L
- Short-term effects of fill
operations limited to
 - Swash zone (<200 mg/L)
 - Surf zone (<35 mg/L)
 - Nearshore bottom waters
(<35 mg/L) within 500 m
of discharge

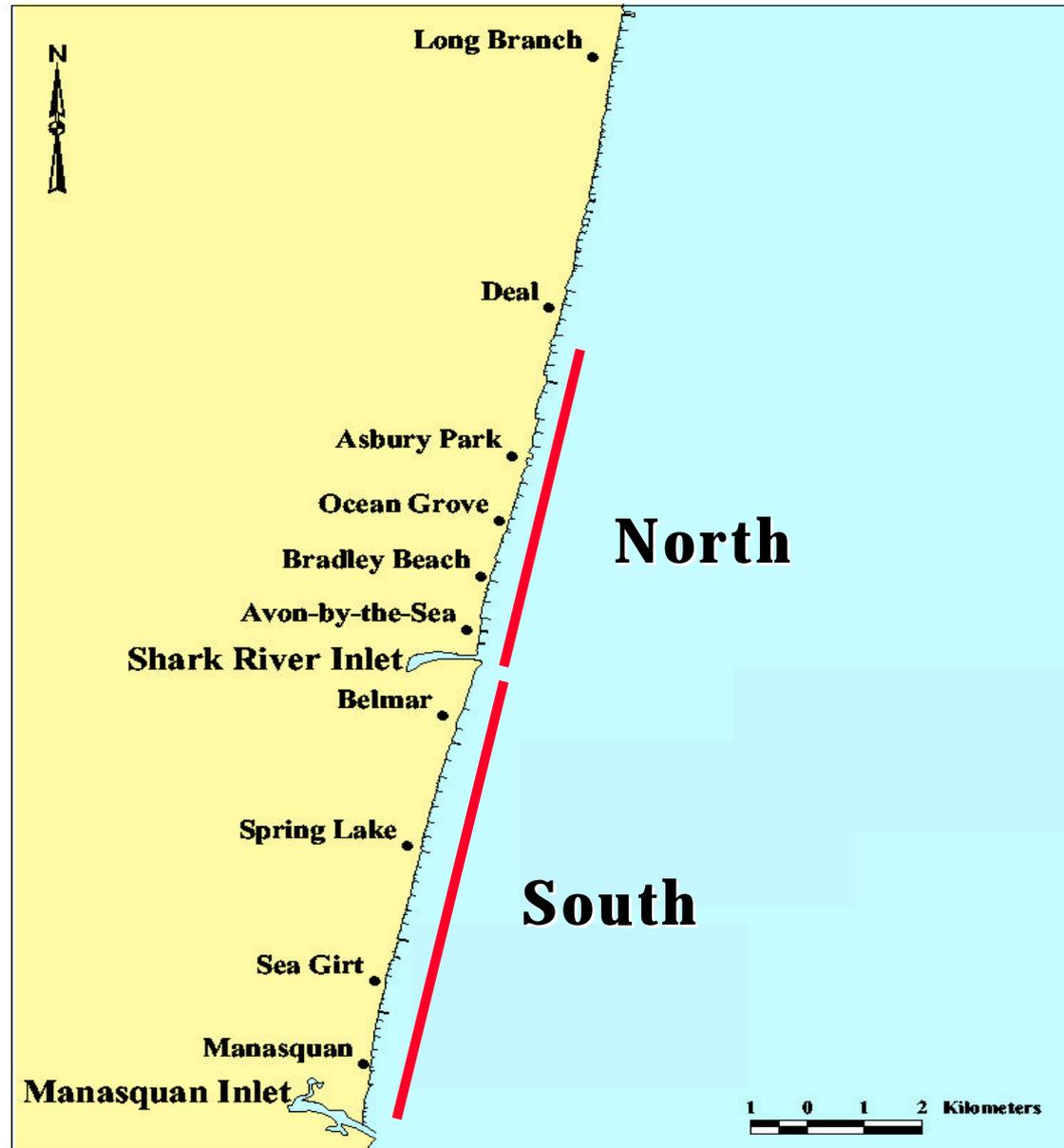
Turbidity & Suspended Sediments



Ichthyoplankton (Larval Fish)

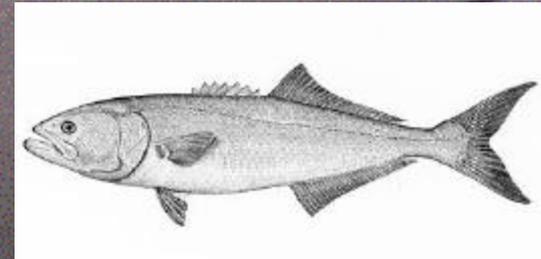
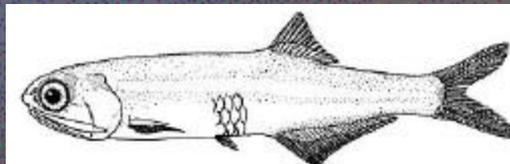
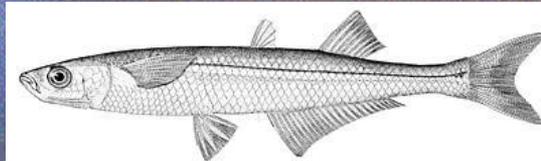
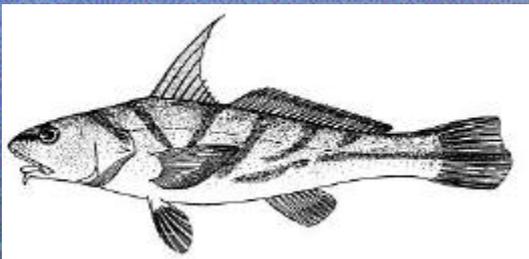


Surf Zone Fish Assemblages



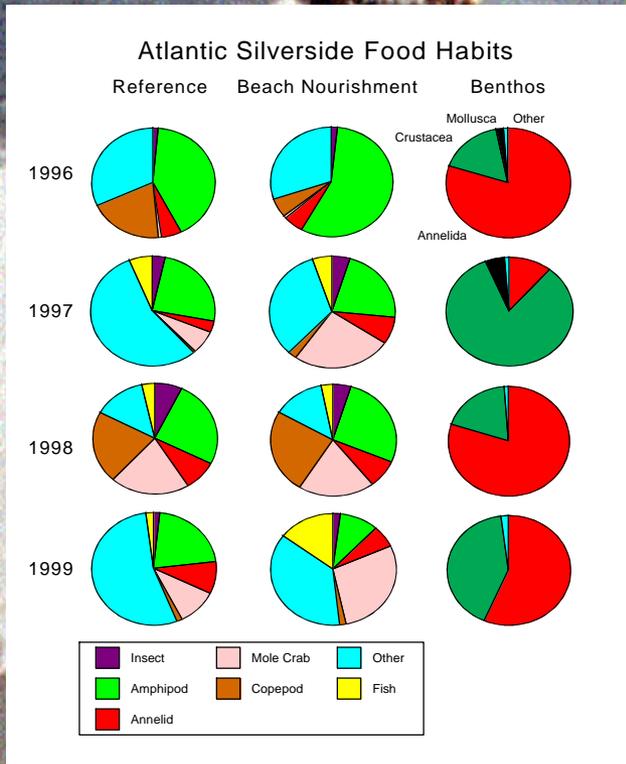
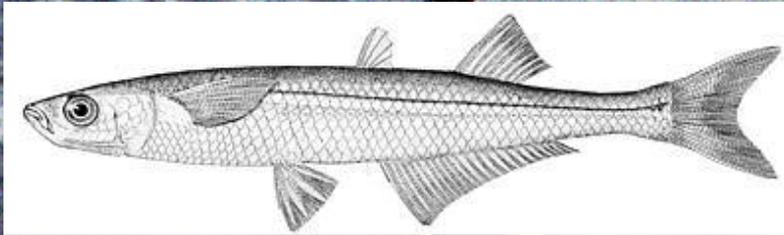
Surf Zone Fish Assemblages

- 300,000 fish collected
- Dominated by silversides, bluefish, and anchovies
- Higher diversity and abundance near groins



Surf Zone Finfish Seine Data

- Low juvenile bluefish abundance near active renourishment
- Increased abundance of northern kingfish near active renourishment
- No mortality or morbidity detected
- No major post-construction impacts detected



- **No changes in types or proportions of prey eaten**
- **No change in feeding success**

Surf Zone Fish Feeding Habits

Offshore Sediments and Benthos

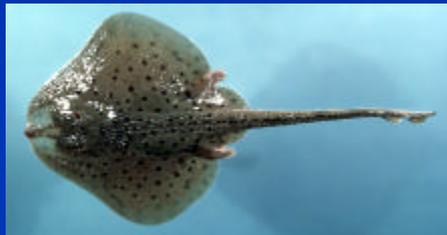
- **Community typical of mid-Atlantic medium sands**
- **Diversity and abundance recovered in 8 months**
- **Biomass required 2-2.5 yrs (after 1997) for recovery**
- **Biomass impact due mostly to Sand Dollar size**
- **Recovery trend in 1999 similar to 1997**



Offshore Borrow Area Finfish Data



- Typical inshore shelf assemblage
- Seasonally and annually variable
- No obvious dredging-related changes



Offshore Borrow Area Finfish Feeding Habits



Finfish Feeding Habits



Summer Flounder



Winter Flounder



**SHARK
RIVER
INLET**



BBA5



BBA6



Offshore Borrow Area Finfish Feeding Habits

- Importance of anemones in winter flounder diets indicates these fish were not reliant on borrow area for trophic support
- Summer flounder diet primarily nektonic (Crabs & Shrimp)
- No major changes in diets after dredging

Project Summary

- No long-term impact to intertidal or nearshore infauna and sediments; recovery from short-term impacts in 2-6.5 months
- No obvious impacts to ichthyoplankton
- Limited turbidity/TSS plume
- Limited effects on surf zone fish assemblage
- No impacts to surf zone fish feeding habits

Project Summary

- Borrow area infaunal recovery takes 2-2.5 years with most of impact on abundance and size structure of sand dollar populations
- No impacts to offshore borrow area fish assemblages
- No detectable shifts in finfish food habits

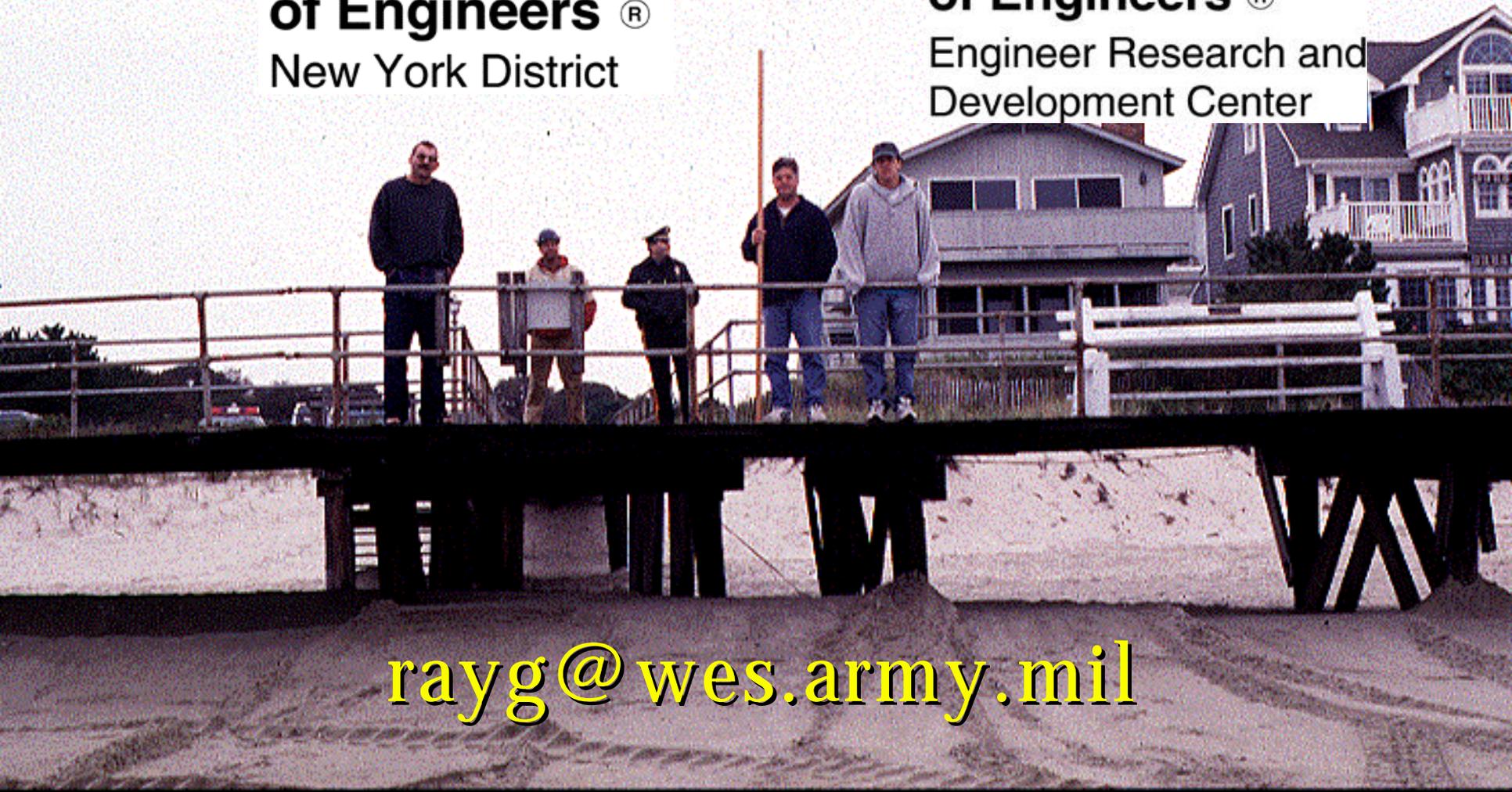


**US Army Corps
of Engineers** ®
New York District



**US Army Corps
of Engineers** ®

Engineer Research and
Development Center



rayg@wes.army.mil