TNC Shellfish Restoration: Past, Present & Future

The Nature Conservancy
SAVING THE LAST GREAT PLACES ON EARTH

Mike Beck
Senior Scientist
Marine Initiative, April 2004

Where we work on marine projects

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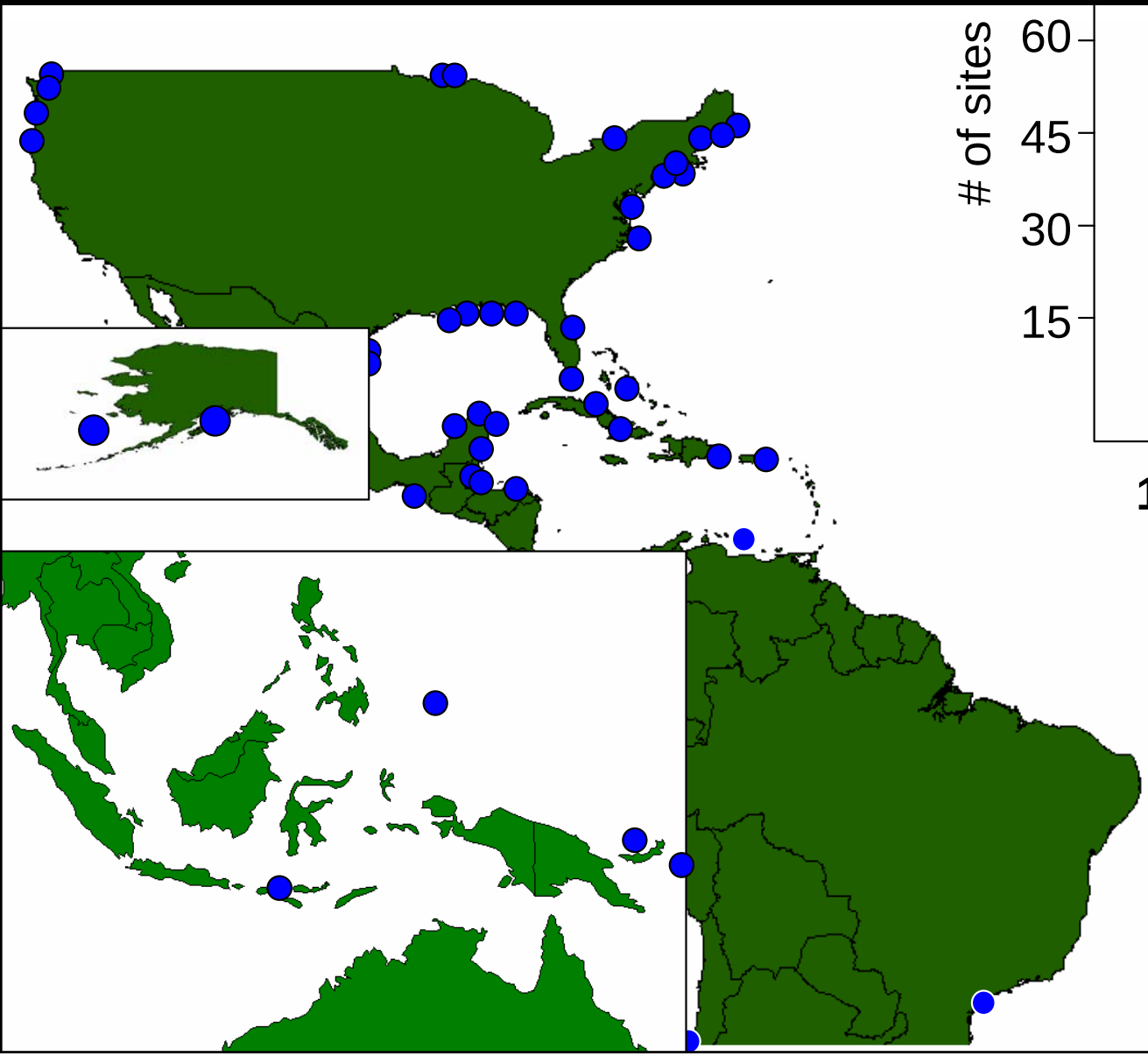

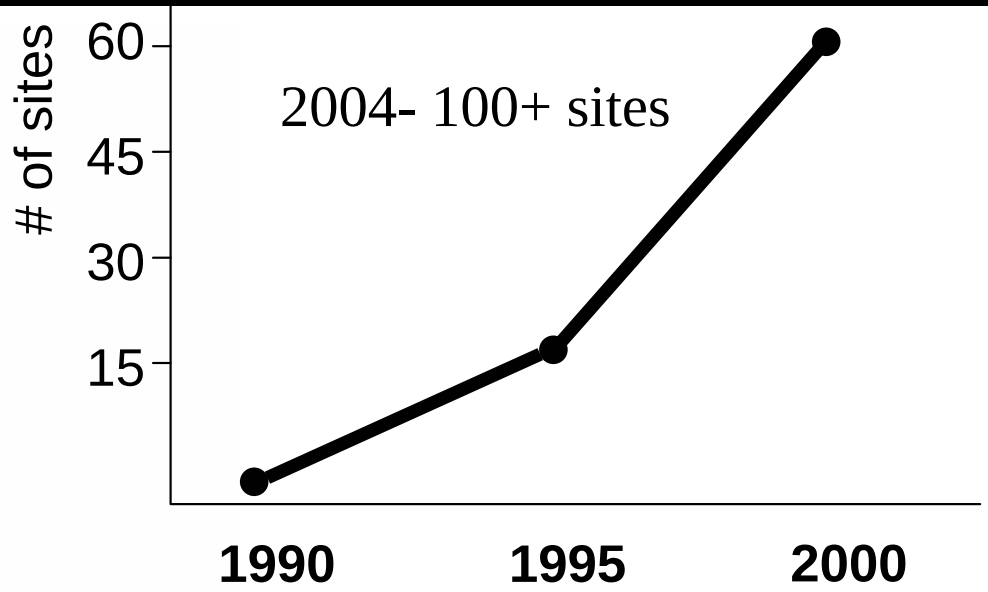

25 coastal countries
& 24 coastal states

the Marine Initiative

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areas of focus

- Setting priorities for marine conservation
- Building coral reef conservation to last
- Pioneering nearshore conservation strategies

mili atoll

Innovative Nearshore Marine Conservation Strategies

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- Restoration
- Ownership and leasing
- Nursery area protection
- Seas to summits
- Local partnerships
- Supportive policies

Great South Bay, New York

Community-Based Restoration

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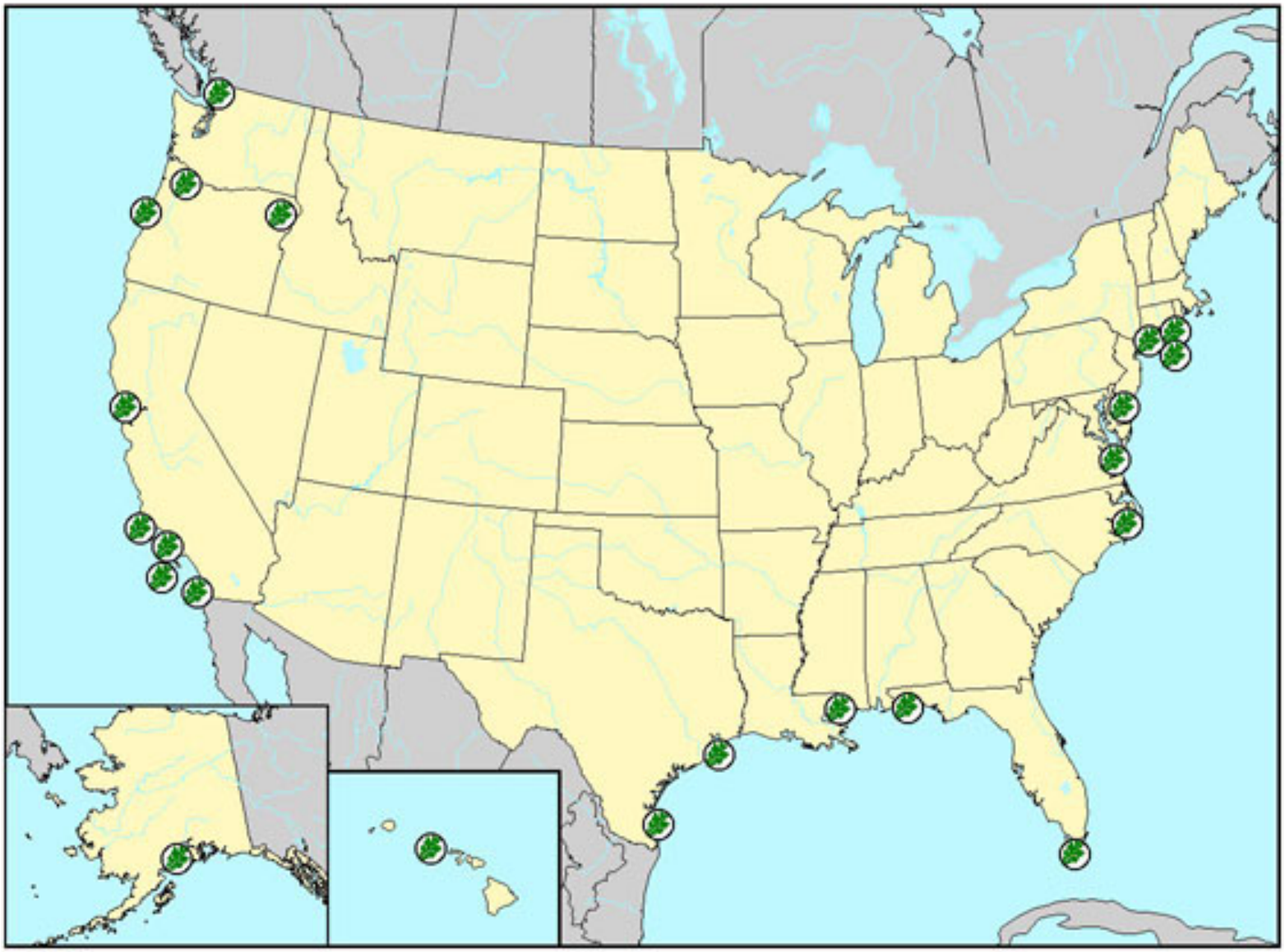
2001-2003 NOAA partnership restoration sites



An Expanded Vision for Restoration

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- Move beyond piecemeal restoration efforts
- Act on appropriate scales at key focus areas
  - Ecoregions where we have existing plans and capacity
  - Shellfish ecosystems nationwide
  - Catalyzing further innovations in restoration
- Leverage match opportunities

Our Shellfish Restoration

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- Peconic Bay, NY
- Great South Bay, NY
- VA Coast Reserve
- Pamlico Sound, NC
- Bay St. Louis, MS
- Puget Sound, WA
- Cobscook Bay, ME

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Constructing oyster reefs in Pamlico Sound

- Oyster spawning sanctuaries at two restoration sites (26 reefs in 45 acres)
- Shell-recycling program and oyster gardening with local partners
- GOAL: Enhance estuarine diversity and build citizen support for a broader, comprehensive estuarine restoration program

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Sub-tidal ownership in Long Island

Benefits of ownership

- restoration
- co-management
- leverage

Bluepoints Projects

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Baseline Data

- Historical data collection, GIS mapping & analysis
- Eelgrass mapping (DOS)
- Benthic mapping (DEC)
- Hard Clam distribution
- Management/restoration experiments & monitoring

Restoration, protection & use

- Eelgrass restoration and preservation
- Hard clam and scallop restoration & spawner sanctuaries
- Small-scale, eco-friendly aquaculture
- Public harvest of wild resources

Peconic Estuary: Pipes Cove

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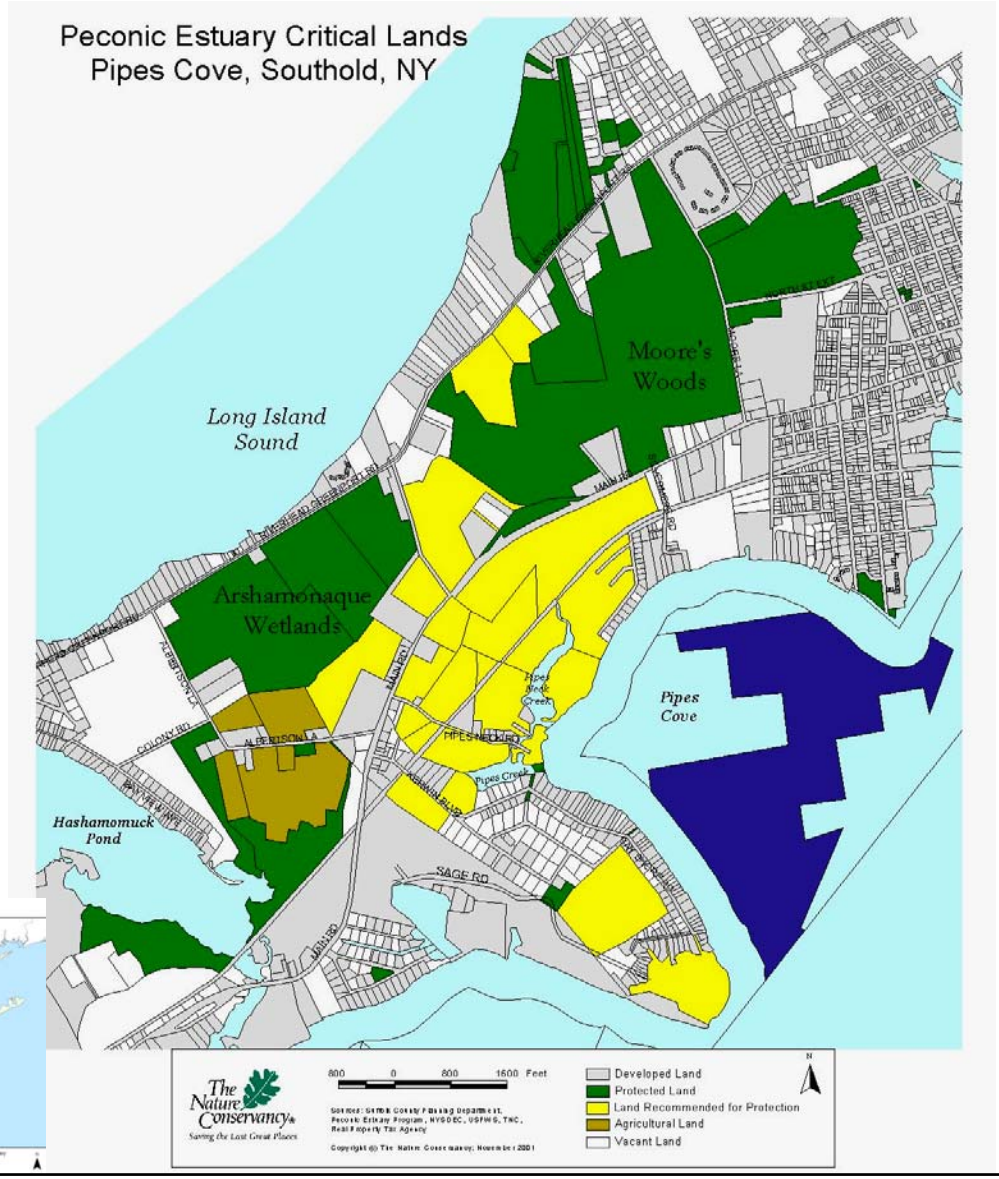
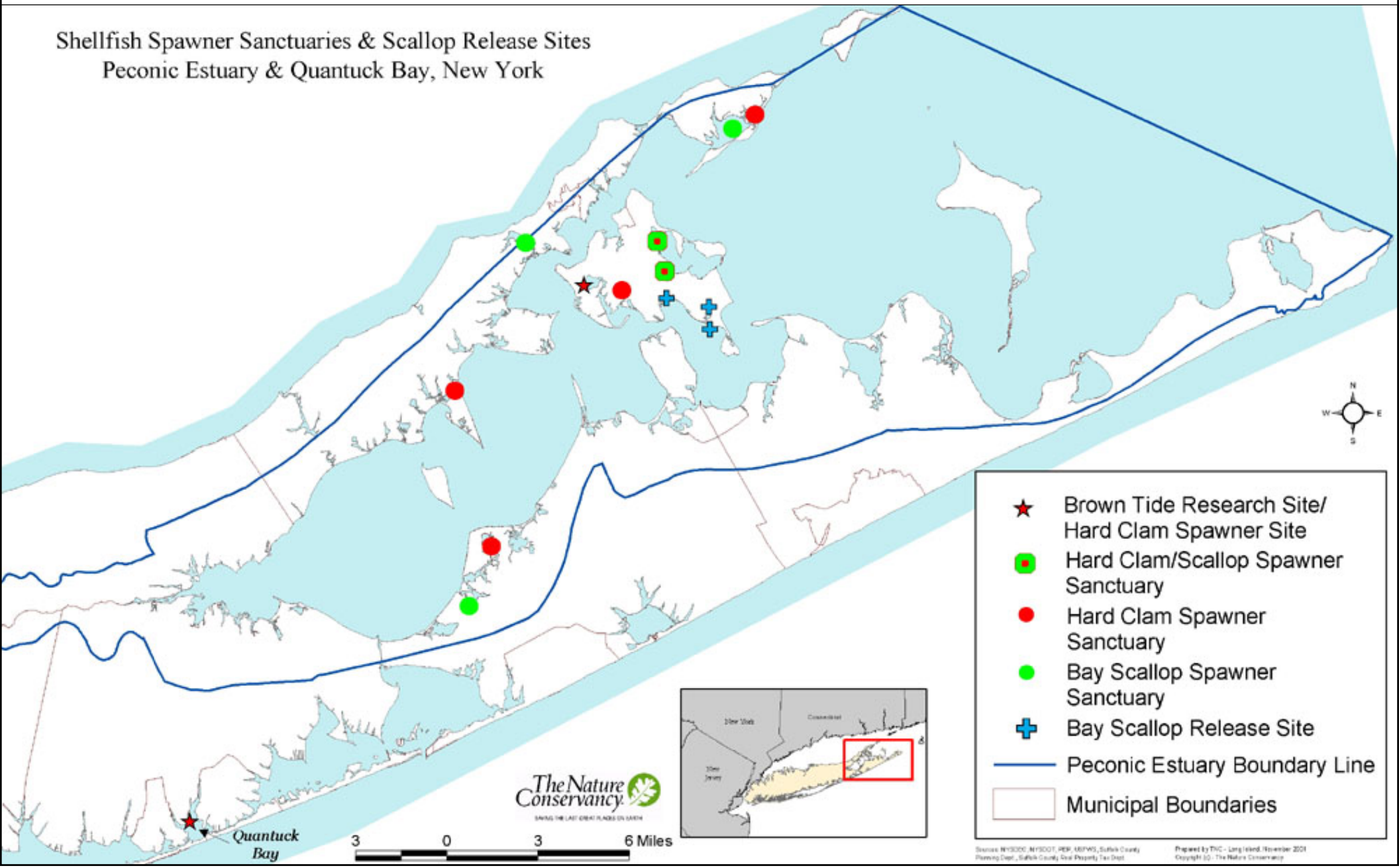
- 199 acres
- Bay bottom management plan
  - Spawner sanctuaries
  - Eelgrass restoration
  - Sustainable aquaculture
  - Research & monitoring
- Coordinated with land preservation efforts




Shellfish Spawner Sanctuaries & Scallop Release Sites
Peconic Estuary & Quantuck Bay, New York
Brown Tide Research Site/ Hard Clam Spawner Site
Hard Clam/Scallop Spawner Sanctuary
Hard Clam Spawner Sanctuary
Bay Scallop Spawner Sanctuary
Bay Scallop Release Site
Peconic Estuary Boundary Line
Municipal Boundaries
Quantuck Bay
3 0 3 6 Miles
The Nature Conservancy
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S

Peconic Bay Ecosystem Restoration

A New Strategy for Marine Conservation

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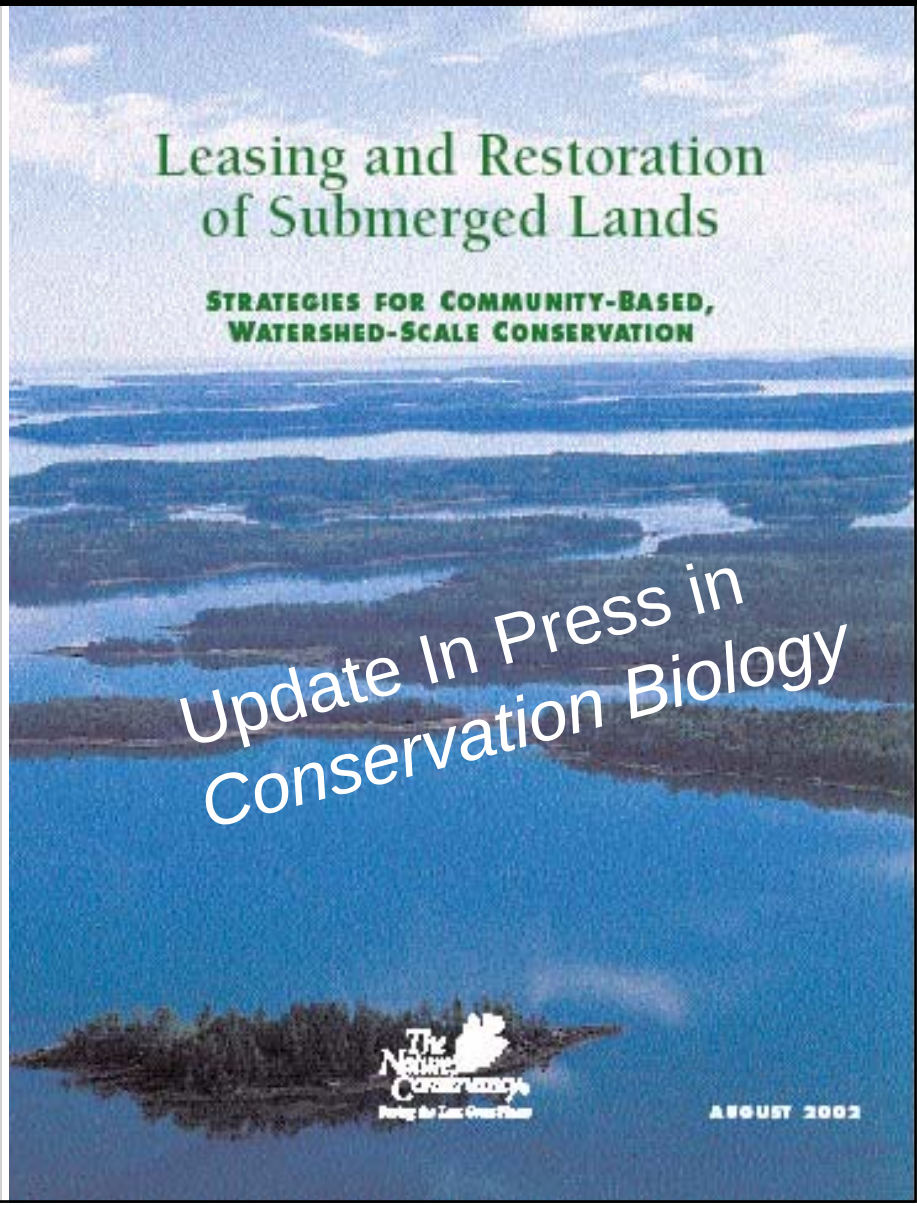
- Opportunity to lease/own submerged land in many states and some countries
- Can be teamed effectively with shellfish restoration to integrate action on lands, rivers and seas
- Opens door to working cooperatively with fishermen and others
- Can engage on state policy
- Uses the Conservancy's 50 years of land acquisition and management experience



Developing a Shellfish Network: Why?

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- Shellfish are at a crossroads
- Little conservation
- Most restoration fishery focused
- Ecosystem benefits understood by scientists; not public
- Goals & Scale of Problem not well articulated
- Lack of Constituency & Funding-- political & cultural

The Nascent Development of a Network

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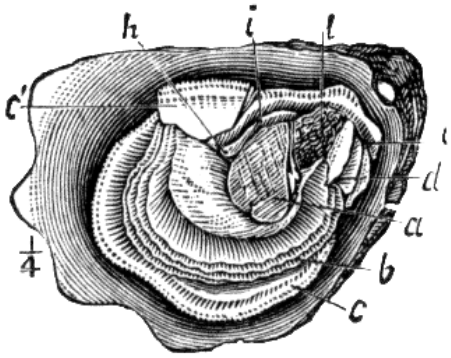
- Initial meeting (internal + CBF, NOAA Restoration & SG)
- Raise private funds to support efforts with CRP
- Compiled info on TNC sites; then CRP, SG sites
- Develop fact sheet that describes present work & future path & needs
- Commission sci. rev. to improve project design/monitoring
- Workshop-- review findings, develop specif
- Require TNC-NOAA CRP sites to test/follo
- Include additional partners/sites



Oyster, p. 1543.

Some Steps in Monitoring

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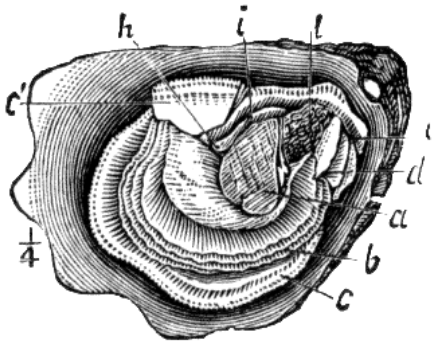
- Working group TNC (MI, Measures), NOAA CRP, + others
- Identify a priori characteristics of ideal measures.
- Identify 2+ different monitoring schemes (e.g., MoS, NOAA, ANOSIM)
- Test these schemes against one another at 2+ sites; Separate funding available
- Compare results to a priori characteristics
- Publish results of comparison



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Monitoring Approaches

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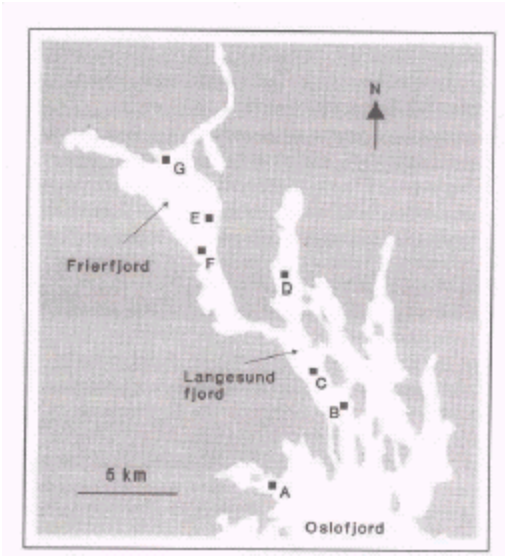
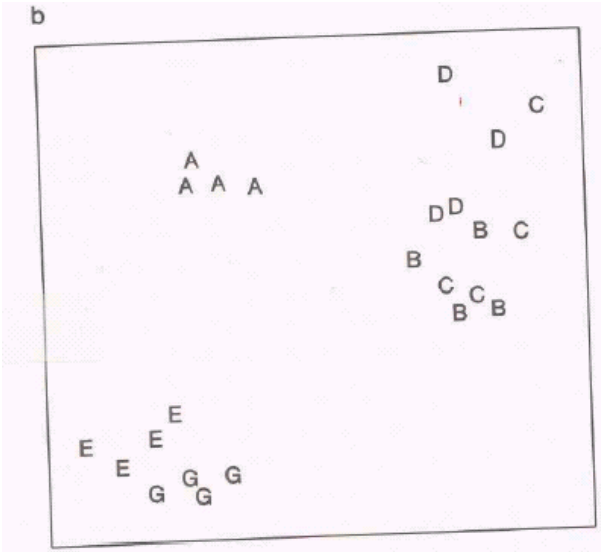
- We can count Species Abundance and Diversity
- Often Presence/Absence will do
- Must use BACR designs (Before, After, Control, Restoration)
- Powerful, non-parametric, multivariate methods, e.g., ANOSIM (e.g., http://www.pml.ac.uk/primer/)
- Commonly used in impact studies; Aus, NZ, Europe, but not in restoration and the US



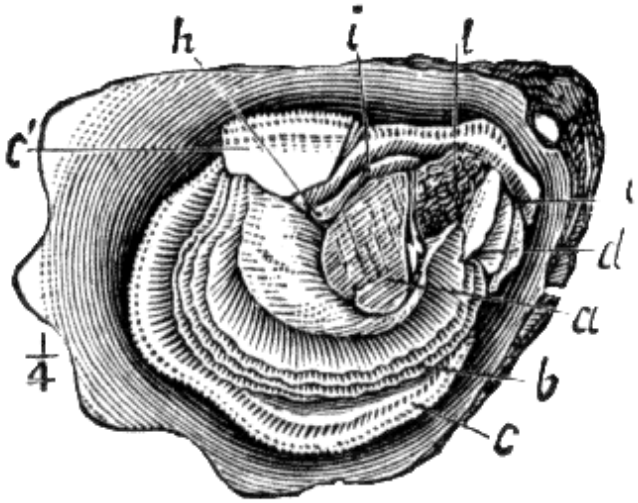
Species	Samples							
	A1	A2	A3	A4	B1	B2	B3	B4
Abundance								
Cerianthus lloydi	0	0	0	0	0	0	0	0
Halicryptus sp.	0	0	0	1	0	0	0	0
Onchnesoma	0	0	0	0	0	0	0	0
Phascolion strombi	0	0	0	1	0	0	1	0
Golfingia sp.	0	0	0	0	0	0	0	0
Holothuroidea	0	0	0	0	0	0	0	0
Nemertina, indet.	12	6	8	6	40	6	19	7
Polychaeta, indet.	5	0	0	0	0	0	1	0
Amaena trilobata	1	1	1	0	0	0	0	0
Amphicteis gunneri	0	0	0	0	4	0	0	0
Ampharetidae	0	0	0	0	1	0	0	0
Anaitides groenl.	0	0	0	1	1	0	0	0
Anaitides sp.	0	0	0	0	0	0	0	0



Opportunities?

There is much overlap in the activities of projects, people & and groups

- Coordinate activities; help to determine network direction
- Help develop/review recommendations for project design
- Partner with TNC Site-specific resto
- Recommend applicants for
  TNC Restoration Prog. Dir.
- Identify joint monitoring methods
  & test sites



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