

**New York State Department of Environmental Conservation
Hudson River Estuary Program**

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Alexander B. Grannis
Commissioner

**To: Hudson River Estuary Management Advisory Committee
(HREMAC)**
From: Fran Dunwell, Hudson River Estuary Coordinator
Re: 2009-2010 Annual Report to HREMAC
Date: May 19, 2010

This report highlights some of the more significant challenges and changes seen in the estuary and throughout the Valley in 2009 and summarizes the status of our work on key program objectives through April 2010. This has been a year of profound challenges and changing economic social and ecological conditions. Yet despite the economic recession, we continue to exert national leadership in many aspects of estuary management. Our use of technology for ecosystem conservation continues to grow and become more sophisticated. Our collaborative approach, which builds the capacity of people and partners, has proved to be a very sound strategy, allowing us to make cost effective use of shared resources and to create a unified vision for the river and its valley. We can be proud of our many achievements in these difficulty times.

THE ESTUARY PROGRAM AND THE ADVISORY COMMITTEE

Completing the 2005-2009 Action Agenda

In 2009, we collectively completed work on our *2005-2009 Action Agenda*, which set deliberately ambitious goals and targets to be achieved by many partners working collaboratively towards a shared vision. With help from literally hundreds of organizations and agencies, we met many of the *Action Agenda* targets set for 2009 in spite of the emerging fiscal crisis, and we made substantial progress on most of the others. Notable exceptions were expensive projects that exceeded available funding, such as land acquisition. The celebration of the 2009 Hudson-Fulton-Champlain Quadricentennial provided a fitting grand finale to these efforts. A full report on the accomplishments for each target of the *2005-2010 Action Agenda* will be posted shortly on our website.

Beginning the scoping of a new Action Agenda for 2010-2014

In 2009, we also began work on a new *Action Agenda* for the years 2010-2014. June's "River Summit" at West Point drew together representatives of local, state and federal government from around the region in a dialogue with community leaders and Estuary Program managers. DEC released its *Draft Hudson River Estuary Action Agenda 2010-2014* for public comment and now plans to release the final document in 2010.

The year 2009 also saw a new program focus on 5 key themes:

- Clean water;
- Fish, wildlife and their habitats;
- River access and recreation;
- Climate change and
- Scenery.

These themes will drive the work on our new Action Agenda in the coming years.

Hudson River Estuary Management Advisory Committee Activities

The Committee provided input to the development of the new *Action Agenda*, helped organize the 2009 River Summit and offered comments on specific issues of concern, such as shad recovery. The Hudson River Estuary Management Advisory committee also embraced a new role as a bridge between the program and valley stakeholders and brought on new members to help accomplish that.

The Hudson River Estuary Management Act calls for DEC to report annually to the Committee on planned and/or anticipated regulatory policy changes which may affect the Hudson River Estuarine District. In 2009, DEC consulted the Committee on proposed regulations to close the shad fishery and on options for managing the herring fishery.

RIVER TRENDS AND ACCOMPLISHMENTS

1. CLEAN WATER

a. Swimmable water quality

Pathogens remain a problem for use of the Hudson River for swimming, kayaking and other forms of water contact recreation, though great progress has been made in recent decades. Since 2004, when New York State announced a plan to finally achieve the goal of swimmable water quality, DEC has been systematically working with municipalities that currently do not meet this standard of water quality and taking corrective measures.

In early 2010, the biggest dischargers of pathogens in the Capital Region--the Albany and Rensselaer County Sewer Districts--negotiated new permits that require them to disinfect their sewage effluent. DEC anticipates that both facilities will be meeting this objective by 2014 or earlier. Sewer facility upgrades and disinfection projects funded in recent years at about 40 smaller facilities in the Capital Region are also slowly coming on line. It is expected that in dry weather, the river will meet swimmable water quality standards in this reach within four years. However, water quality will continue to be a problem here, as elsewhere, on the river following even small amounts of rainfall, due to combined sewer overflows.

The river currently meets dry weather standards for swimmable water quality south of the Capital Region much of the time. However, 2009 water sampling by Riverkeeper in partnership with the Lamont Doherty Earth Observatory has revealed localized exceedances that require further action.

b. PCB's & chemical contaminants

Under the direction of the NY-NJ Harbor Estuary Program, the assessment phase of the Contamination Assessment and Reduction Project (CARP) was completed, providing new insights, models, and tools for reducing pollutants throughout the estuary. A model is now available that can predict how different portions of the harbor will respond to remediation efforts. The model points to upper Hudson PCBs as the most significant contaminant source and the one most responsive to remediation.

Phase one of a Federal Superfund project to remove PCBs on the upper Hudson was undertaken by General Electric in 2009, pursuant to a settlement with USEPA. Monitoring results from this first phase of work are now being evaluated to determine if changes to project designs and standards are needed. USEPA currently anticipates that the remaining second phase of work will likely begin in 2011 and take approximately five years to complete.

c. Stream water quality

Grassroots watershed organizations have been formed to guide comprehensive stream protection and restoration programs on 12 tributaries throughout the Hudson Valley, and they are tackling such issues as stream buffer protection, dam removal, flood plain conservation, land use and stream water quality. Watershed management plans or intermunicipal watershed agreements have been developed for seven of these watersheds. The reduction in state grant funding for these watershed programs in 2009 has made it very challenging to sustain these efforts; however, a recently-formed Hudson River Watershed Alliance has provided leadership to keep priority issues in focus. Planning is underway to develop a pilot "model watershed program" that will integrate conservation of ground water, surface water and source water to provide for the dual needs of the ecosystem and the human uses it supports. A stream barrier mitigation program is under development. Engaging over 750 volunteers on 50 projects, the Estuary Program's Trees for Tribs project has planted over 7,000 shrubs and trees on over 22,000 feet of streambank this past spring and fall.

d. Drinking water/Source water

Many communities and industries are looking to the Hudson as a new source of water, and water resources from reservoirs and ground water in the Hudson Valley region are also getting more attention. A desalination plant has been proposed to provide drinking water in Rockland County, and Orange County

communities are now making decisions about how to manage their water resources as it pertains to their future growth. The Estuary Program seeks to protect the quantity and quality of water in the Hudson. In 2009, we continued working with county water authorities, municipalities, soil and water agencies and community groups to promote policies and practices that will conserve the quality of surface water and groundwater and to promote the infiltration of rainwater in to the ground, instead of piping it away into drainage systems. A pilot project in the Town of Wappinger sponsored by the Estuary Program resulted in the adoption of new “Better Site Design” codes and ordinances to conserve water resources locally.

e. Hudson River Environmental Conditions Observatory System (HRECOS)

Now seven HRECOS real-time monitoring stations are up and running on a pilot basis, with six organizations operating and supporting the system working in partnership with DEC. The HRECOS network serves as a “backbone” for evaluating trends in environmental conditions in the river that can be related to Estuary Program progress. In addition, HRECOS is: adding to our understanding of extreme weather events in the Valley and their effects on the estuary; providing a unique educational tool; extending the work of the Contaminant Assessment and Reduction Program (CARP) and the Regional Sediment Management Plan; and providing real-time data to river users. Installation of monitoring equipment on the *Clearwater* is planned for 2010.

2. FISH, WILDLIFE & THEIR HABITATS

Migratory fishes and marine species

a. American shad

Since 2002, production of young shad hit historically low levels. With no improvement since then, in 2009 DEC moved forward with a closure of all shad fisheries in the Hudson River and Marine District. Work on the shad recovery plan began with low-cost pilot efforts: The first year of a three-year study of commercial fishing in the ocean, conducted in partnership between the Hudson River Estuary Program and other Atlantic coast states, revealed that river herring and juvenile shad appear to be a by-catch in ocean fisheries, including the Atlantic herring fishery; DEC also collected samples for predator-prey studies and conducted its first tracking of American shad to their spawning habitat, using sonic tags implanted in spawning adults. This study, the first of a three-year effort, revealed that shad use of its spawning habitat appears to have contracted to the upper reaches of the estuary above Bethlehem. For young larval shad, food items may be increasing after a decade of decrease due to changes in zebra mussel survival, according to our research partners at the Cary Institute of Ecosystem Studies (see below).

NYSDEC, through its ecosystem-based approach and staff expertise has become a national leader in this field. We were the driving force for development and adoption of new coast-wide plans that emphasized habitat restoration and ecosystem management in addition to more traditional fishing restrictions that restrict mortality but do not necessarily result in stock recovery. Our shad recovery efforts are now being copied by Pennsylvania, New Jersey and Delaware. All other Atlantic Coast States will begin to adopt these measures.

b. Striped bass

In response to coast-wide recovery efforts in the 1980s and on-going fine tuning of fishing regulations, the striped bass populations are relatively stable. The age structure of adults in the spawning population remained stable, mortality rates of adults remained at acceptable levels, and the relative abundance of juveniles continued to fluctuate widely with no trend. No new regulatory action was taken in 2009.

c. Atlantic Sturgeon

NYSDEC has been a leader in sturgeon management since 1996, coordinating efforts that led to coast-wide protective measures and spear heading research on river and ocean habitat use. The Hudson is one of the most important estuaries for this species in the face of world-wide declines in wild sturgeon stocks. In 2009, the Hudson River Fisheries Unit continued to track the movements of sonic tagged adult Atlantic sturgeon; fifty adult Atlantic sturgeon were caught and tagged in 2009; six males, tagged in previous years, returned in 2009. Returning tagged adults will be tracked for 2-3 more years during the battery life of the tags.

Electric utility sampling that started in the early 1970s suggests that abundance of juvenile sturgeon has increased following imposition of the sturgeon harvest moratorium in 1996. DEC captured 203 juvenile Atlantic sturgeon during annual sampling in 2009. The index of juvenile abundance has varied without trend since the start of DEC Estuary Program sampling in 2004 through the present, in the context of an overall increase since 1996 reported from utility sampling. At least 3 more years of juvenile sampling is required to develop the method to index annual abundance.

d. River herring

In May 2009, the Atlantic States Marine Fisheries Commission (ASMFC) adopted Amendment 2 to guide river herring management. This amendment requires that New York prove that existing fisheries are sustainable or face closure. The Hudson's current fishery is not defensible. DEC held several public information meetings to gain stakeholder input on possible future regulations for the fishery. A sustainable fishery plan will be developed for submittal to ASMFC by July 1, 2010.

e. Fish mortality from power plants

In March 2010 DEC announced a new proposed policy that will add significant protections for New York's vital fisheries. The proposal calls for power plants and other facilities that use water for cooling purposes to recycle and reuse that water through a process known as "closed cycle cooling" technology. This will greatly reduce the amount of water withdrawn from New York rivers or other water bodies and, correspondingly, minimize the amount of fish, fish eggs and larvae destroyed in the process. The policy implements "best technology available" (BTA) requirements under the federal Clean Water Act.

By requiring modern recycling technology, New York's marine resources will be afforded greater protection, including many marine fish species that are vital to the state's commercial and recreational fishing industries but are being harmed by water intakes. Closed cycle cooling technology re-circulates the water instead of discharging it after one use, reducing the impacts on aquatic life by more than 90 percent.

The proposed policy would apply to nearly all facilities designed to withdraw 20 million or more gallons of water per day and that require a State Pollution Discharge Elimination System (SPDES) permit--unless an operator can demonstrate that closed cycle cooling technology cannot physically be implemented at a particular location. In that scenario, DEC will require other technologies to achieve essentially the same level of protection for aquatic life as closed cycle cooling. Such determinations typically are made when an operator applies for, or renews a SPDES permit.

Marine Habitat

a. River bottom habitats

Our ground-breaking use of multiple advanced technologies to map the river bottom and integrate this information with sediment cores and electronic tracking of fish movement has propelled the estuary habitat work to national recognition. This success has been based on a deep water mapping completed in 2003. Mapping of shallower waters was stalled due to lack of funds until 2009, when federal funds procured by Congressman John Hall through NOAA allowed for a pilot mapping of the shallow waters, less than four meters deep, of the Hudson River. Under the pilot project, shallow areas were mapped from Troy to Saugerties in late 2009. Although our contractor was initially optimistic about obtaining 100% coverage, only about 60% of the area was mapped. Preliminary results show a complex shallow water environment that includes features such as

fields of sand waves and as-yet unexplained artificial perturbations of the bottom. Staff members are working with the contractor to expand the coverage and complete all deliverables, and with scientists to use the new data to define shad habitat. When completed this project will greatly enhance an already important product that applies technology to the management of ecosystems.

b. Shoreline habitats

Shorelines continued to be a focus of a major NOAA-funded national pilot research program, conducted by the Hudson River National Estuarine Research Reserve (HRNERR), that is exploring the functions of several different natural and engineered shoreline types. This information will be used to inform shoreline management and sea level rise adaptation planning. This project will culminate in the development of guidance for municipalities on the best shoreline treatments to use as sea level rises. It will serve local, regional and national guidance purposes. A proposal to continue this work is being submitted to NOAA in 2010.

c. Submerged aquatic vegetation (SAV)

DEC's SAV project team biologists and partners began monitoring submerged aquatic vegetation (SAV) in 1995. A 2002 inventory showed a smaller acreage of the dominant native plant, water celery. A third inventory was flown in 2007 and completed in 2009; this inventory, augmented by annual volunteer monitoring of SAV beds, provided new information about SAV trends since 1995. The 2007 inventory showed dramatic reductions in some SAV beds. Possible loss of SAV is a concern due to its vital importance in supporting food webs and producing oxygen in the ecosystem. However, examination of both the inventory and subsequent monitoring results indicate high variability from year to year in the coverage of SAV, with a 10-fold variation in biomass documented at some beds over a four-year period. Based on this variability of SAV biomass, the SAV study team has developed GIS maps of all documented SAV habitat for use in regulatory, research and planning settings. This new coverage will be distributed on the Web and via workshops with target user groups in 2010.

d. Habitat restoration

Several advances were made in the habitat restoration program in 2009. Marine habitat and fisheries staff began baseline studies of reference and candidate secondary channel restoration sites in the upper Hudson River estuary, and made several presentations about the potential for secondary channel restoration. Restoration staff expanded control of the invasive plant *Phragmites australis* in Tivoli North Bay to include the last known established *Phragmites* stand.

e. Oyster reef habitat

In 2009, DEC and its partners documented the presence of live oysters in Haverstraw Bay. In 2008 research partners at the State University of New York at Stony Brook also found that oysters are growing and surviving well when placed

in cages in a number of localities in Haverstraw Bay. These larvae likely came from living natural oyster populations nearby. This research is part of an initiative to study the feasibility of restoring oyster populations and reef habitat in the Hudson, and it completed the second and final year of a study of the feasibility of restoring oysters to the Tappan Zee region of the Hudson River.

Upland Habitats

a. Mapping habitats and measuring change at a valley-wide scale

In 2009, the Estuary Program continued its initiative to monitor changes in plant and animal populations and threats to wetlands and forests such as fragmentation. This work will be important for protection of water resources as well as habitats. Working with the Estuary Program, Cornell University developed a wildlife and habitat monitoring plan for the Hudson Valley and began monitoring breeding bird populations, land-use change, and the relationship between habitat modification and population trends starting in 2006. The monitoring program developed and piloted approaches for tracking species of conservation concern in the Hudson Valley that will be useful statewide. In 2008, Estuary Program funds leveraged \$140,000 of federal State Wildlife Grants to continue piloting the monitoring program in the Hudson Valley.

In 2009, an on-going partnership with the NY Natural Heritage Program to map rare and significant plants, animals, and ecosystems was suspended due to lack of state funds. These maps and associated conservation information are key resources for local governments as they implement land-use plans and environmental review. They also contribute to the State's Wildlife Action Plan.

b. Climate change and habitat

A federally-funded partnership with the Heritage Program to identify and prioritize habitat corridors for plants and animals to migrate in response to climate change is moving forward and will inform regional open space planning. Estuary Program funds leveraged \$285,000 from the US Fish and Wildlife Service for these projects.

c. Technical assistance to landuse decision makers

In addition to gathering baseline information on biological resources, the Estuary Program, in partnership with Cornell University, offered technical assistance to local land-use decision-makers to achieve landscape conservation throughout the Hudson Valley. Our work with decision-makers is a model statewide and nationally, and complements DEC's existing regulatory and open space conservation programs. With help from the Estuary Program and its partners, municipalities implemented significant new conservation programs in 2009. A few highlights include:

- The Shawangunk Mountain Regional Partnership finalized its Regional Open Space Plan, which was unanimously approved by 11 participating municipalities
- The Towns of Clinton, Woodstock, and Rhinebeck enacted local wetland protection.
- The Town and Village of Coxsackie adopted standards for planning board applicants to identify and conserve natural areas, including wetlands, streams and wildlife habitat, as part of the update of its new comprehensive plan and zoning.
- Philipstown adopted a Comprehensive Plan including a detailed section on natural areas that recognized their importance for clean water and scenic beauty. In early 2009, the Town Board adopted a Natural Resources Plan and Open Space Index.
- Hyde Park volunteers completed 10 months of training and produced a 3,000-acre map of natural areas. With these data and additional information provided by Cornell and DEC, the town created Critical Environmental Areas (CEAs).
- The Town and Village of Coxsackie adopted a new Comprehensive Plan and zoning code that will help protect priority grasslands identified in the *Action Agenda*.
- The Town of New Lebanon created its first ever Conservation Advisory Council (CAC), and the Town of New Paltz's CAC became a Conservation Board.
- The Town of Marbletown adopted a plan to protect its forests, aquifers, streams, and farms.

d. Building local capacity to conserve habitat

In 2009, through our own outreach programs and in partnership with Cornell Extension and the non-profit Hudsonia, we educated 134 town leaders in using State Environmental Quality Review (SEQR) and other conservation tools more effectively; provided summaries of biological data to 5 towns (Towns of Lloyd, Gallatin, New Paltz, Pawling, and Fishkill) to inform local conservation plans or improve environmental review procedures; assisted 12 municipalities and 14 non-profit organizations with developing and implementing habitat conservation plans and programs; trained 90 rural forest landowners in methods for managing biodiversity resources on their property; trained 209 community leaders to recognize and understand local biodiversity resources and effectively communicate their importance; engaged over 150 citizen-scientists in amphibian conservation initiatives in the Valley; and recruited over 30 volunteers to report on 40 road crossings where amphibian migrations were observed.

In 2009, in partnership with Hudsonia we trained 16 community leaders from the Town of Ulster, City of Kingston, and Town of Red Hook over 10 months to

recognize and map local habitats and ecosystems, and communicate their importance to decision-makers; provided technical assistance to complete habitat maps and reports for 9 towns (Towns of Nassau, Saugerties, Bedford, Somers, Ancram, Hyde Park, Lloyd, New Paltz, and Berne) that inform conservation planning and improve local procedures; provided assistance with biodiversity assessment and mapping methods to the Towns of Gardiner, Shawangunk, Rhinebeck, and Clinton and Dutchess County; and assisted the Town of Beekman with planning and zoning updates. This significant conservation education program offered by the Estuary Program through contracted services with Hudsonia to train local governments, land trusts, and community leaders has been recently suspended due to lack of funding.

Invasive and exotic species

a. Northern snakehead

The year 2008 saw the appearance of Northern Snakehead fish into the Wallkill River basin of the Hudson River watershed. An aggressive competitor not native to this area, it could change the species composition of the watershed if it becomes established and spread to other water bodies, including the Hudson. DEC mounted an eradication program in 2008; however, in 2009 two adult snakeheads were found downstream of the treated area. Following an additional eradication effort in 2009, DEC is cautiously optimistic that all northern snakeheads in the treatment area were killed. To date, there is no evidence that snakeheads have dispersed beyond the treated area (additional electrofishing was done as recently as 5/4/2010). However snakehead can be reintroduced to the Hudson ecosystem by individuals who are not knowledgeable about the damage this non-native fish can cause.

b. Chinese mitten crab

Initially discovered in late 2007 in the estuary, 28 Chinese mitten crabs were found in the river and its tributaries in 2008, and 25 in 2009. The crabs known range in the Hudson now extends from New York Harbor (where egg-bearing females were found) up to Albany. This species is too widespread to be eradicated; DEC efforts are focused on documenting which tributaries host this crab. Because of its diet and burrowing habits, changes to the ecology of tidal habitats and tributary streams are expected.

c. Zebra mussels

Zebra mussels, introduced to the Hudson in 1991, have been widespread in the Hudson's fresh tidal waters since 1992, with well-documented major impacts on the ecosystem. However, their mortality rate has greatly increased in recent years. Blue crab predation is a significant factor, but other causes are probably also at work. The mussel population has not decreased, but it now consists of smaller, younger individuals. As a result, the rate at which they filter river water is now

only 20% of what it was in 1993. Zooplankton biomass is back to pre-invasion levels; native pearly mussel densities have doubled since 2000. According to Dave Strayer and his colleagues at the Cary Institute of Ecosystem Studies, it is not known if this increased zebra mussel mortality is a permanent change or just a temporary blip. It is hoped that this increase in plankton will support fish such as shad which depend on this food source.

d. Mile-a-minute vine

On land, mile-a-minute vine and other invasive plants continue to spread. Work continues to determine how the ecosystem is responding, and how these species introductions will affect our ability to meet ecological recovery targets.

3. RIVER ACCESS AND WATER RECREATION, INCLUDING EDUCATION & WATERFRONT REVITALIZATION

a. Docks and other access

In 2009, DEC completed 7 access projects funded by Estuary Grants from prior years. Our partners at DOS and the Greenway launched a new program to establish “Eco docks” on the river, funded through the National Heritage Area and the NYS Environmental Protection Fund (see Greenway planning & waterfront revitalization below)

b. Access for schools

In 2009, the seventh annual “Day in the Life of the River” event, a field experience which coordinates student observations along the length of the estuary from Troy to New York City, was attended by 3,000 students from nearly 70 schools at 60 sites. This event brings students to the river and puts their local learning in the context of the entire estuary through web posting and discussion of results. The data students collect are used in their classrooms. This event exposes teachers to the estuary and a network of river educators, trains them in basic water quality assessment skills and helps students visualize what they learn in school.

The number of classrooms studying the Hudson continues to increase as the Estuary Program provides more field experiences, teacher training programs, and curriculum materials. Dozens of lesson plans developed by the program and our partners and posted on the World Wide Web in 2009 allow teachers to use the river as a context to teach basic math, writing, science, and social studies skills in accordance with state learning standards. During the school year, the Estuary Program lesson plan website was visited about 100 times per week on average.

In the second year of the citizen science program designed to track glass eel migration into tributaries (see Goal 1), Estuary Program educators recruited and supervised scores of high school students to conduct the monitoring and gain

experience in actual scientific research in the field, at six sites from Westchester and Rockland Counties to northern Dutchess County.

c. Waterfront revitalization

In 2009, the Department of State announced:

- \$3.1 million in funding for 11 Local Waterfront Revitalization Program projects in the Hudson Valley for waterfront revitalization, all funded by the NYS Environmental Protection Fund.
- Developed a new program for "eco-docks," which is providing over \$690,000 in funding for 12 projects that will improve recreational, non-motorized boating access along the Hudson River and Lake Champlain,
- Solicited applications for smart growth planning projects in the Lower Hudson Valley. A total of \$500,000 has been awarded for seven projects.
- Finalized and distributed a new multi-media package on Completing Watershed Management Plans.

d. Greenway planning

The Hudson River Valley Greenway:

- Awarded nearly \$148,750 in grants for 14 smart growth planning projects throughout the Hudson River Valley
- Annual events like the Hudson River Valley Ramble and Great Hudson River Paddle were bigger than ever during the Quadricentennial year
- Through Conservancy Small Grants Program, the Greenway allocated nearly \$90,000 to 10 Greenway Trail projects throughout the valley

4. CLIMATE CHANGE

a. Changing Climate patterns

Our climate is changing in New York and in the Hudson Valley. Average annual temperatures in NYS are up by nearly 2 degrees Fahrenheit and average winter temperatures have warmed almost 5 degrees F since 1970. According to data collected at the Mohonk Preserve NOAA weather station, 5 of the top 10 warmest Aprils have occurred in the last 6 years. Similar to rest of the state, spring is arriving earlier, summers are growing hotter and longer, and winters become warmer. The effect of climate change on plants and animals has also been documented at the Preserve. Records show that some spring flowers are blooming earlier and some birds are migrating further north and arriving earlier than they did in the 1930s. Sea level is also changing. It has risen 15" in New York Harbor over the last 150 years and 4-6" since the 1960s.

b. Community-level climate action

In 2008, in partnership with DEC Region 3 and the DEC Office of Climate Change, the Estuary Program assisted in developing guidance for local government on actions they can take to mitigate and adapt to climate change. To date, 76 communities in New York State have adopted the Climate Smart Communities Pledge, with more than 30 of those in the Hudson Valley, and the number is growing rapidly.

c. Sea Level Rise Task Force

The NYS Sea Level Rise Task Force will produce recommendations to the state legislature by the end of 2010. Studies done for the Estuary Program by Cornell University will be incorporated into this report. They show that the effects of sea level rise and storm surge will affect the entire estuary to Troy, however the impacts of predicted increases in rainfall will be more localized to the upper estuary. We are working with shoreline communities to understand their information needs so we can help them to prepare for the impacts of climate change in their communities.

5. SCENERY

a. Coordinated land management/Estuary Preserve

Staff from DEC, the NYS Office of Parks, Recreation and Historic Preservation (OPRHP), and NYS Office of General Services (OGS) have met several times with land trusts and environmental groups from the Hudson Valley to discuss future land conservation and stewardship efforts. An “Estuary Preserve” is proposed to provide a framework for voluntary coordinated land management on the upper estuary from Hyde Park to Castleton.

b. Open space acquisition

As part of the 2009 Hudson-Fulton-Champlain Quadricentennial, DEC Commissioner Pete Grannis announced the first "legacy project" of the celebration: acquisition of a portion of the historic Livingston Manor on the shores of the Hudson River in Columbia County. DEC purchased the 320-acre parcel from the Livingston family for \$2.4 million, facilitated by the Trust for Public Land (TPL). The parcel, to be known as the Livingston State Forest, includes some steep Hudson River shoreline and opportunities for a variety of uses.

CONCLUSION

As evidenced by this report and our on-line summary of accomplishments for *2005-2009 Action Agenda*, in 2009-2010 the Estuary Program and its many partners have taken immense strides in meeting our long range goals and adapting to changing conditions on the Hudson despite significant challenges due to the economic recession.

Hudson River Estuary Management Advisory Committee HREMAC Members and Ex-Officios as of March 2010

HREMAC Members:

Dennis Suszkowski, Committee Chairman
Hudson River Foundation

Judy Anderson
Community Consultants

Allan Beers
Rockland County

Andrew Bicking
Scenic Hudson, Inc.

Bill Conners
Federation of Dutchess County Fish and
Game Clubs

Gina D'Agrosa
Westchester County

Katie Dolan
Auburn Theological Seminary

John Dorritie
Penny Bridge Marina
Hudson Valley Marine Trades Association

Bill Emslie
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Hudson River Estuary Program <http://www.dec.ny.gov/lands/4920.html>

Hudson River Estuary Management Advisory Committee

<http://www.dec.ny.gov/about/46924.html>