Minutes
September 16, 2010
Maryland Coastal Bays Program
Sediment Management in the Coastal Bays Workshop
Ocean City Convention Center

Overall Summary

1. Need for shorebird habitat restoration
2. Dredged material is a resource that should be conserved
3. SAV and clams prefer sand to finer grain materials that are easily re-suspended

Action Items:

1. Update the OC Water Resources document? Create an addendum? Determine which channels are maintained by which agency. Do the different agency priorities line up together?
2. Canal dredge plan document is complete, permits are pending, money is needed to facilitate.
3. Where is Skimmer Island going and why – modeling needed.
4. Determine changes in wind patterns along the northeast coast- are sediment patterns changing?
5. Match grain size material available to projects' needs. Determine areas with probability of erosion potential. Permit requirements for donor sites and acceptor sites should be streamlined. Talk to Bob Burnett(?) Waterway Improvement Program. What are the scales/sizes of each project? Is there a minimum sized amount of material that does not require a long decision process?
6. Create Coastal Bays Sediment Management Group.
    a. Dan Bireley ACOE planning, port warden, shoreline commission, clammers, aquaculture sites, other stakeholders
    b. Funding sources
    c. Sediment budget
    d. Monitoring needs
    e. What questions should be asked to justify decisions, what is the timeframe to line up projects, funding & permits
    f. Pilot projects: skimmer island, south Sinepuxent Island, Dog & Bitch islands
    g. short term needs versus long term sediment management
7. Next Steps
    a. Flood shoal estimate of material, hydrodynamics, use to justify decisions for permitting, analysis of potential conflict to navigation. What are the criteria for ACOE approval?
    b. Use bathymetry and aerials to analyze potential sediment movement, can this be used for predictions and by extension justification for permitting
    c. Cost comparison between localized disposal versus upland disposal.
    d. Analyze the sediments in the channels & canals, find a holding area?
    e. Existing studies: Sensitive Areas, OC Water Resources, Shoreline Inventory, Alternative methods for using dredge materials, mitigation needs,
    f. Send Roman Jesien MCBP stakeholder contact information for committee development

Attendees:

Roman Jesien	Maryland Coastal Bays Program	rjesien@mdcoastalbays.org
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Jamie Montgomery	Hi-Tide Marine	JMontgomery@Hitidemarine.com
Steve Taylor	MCBP Board of Directors	stevenblaketaylor@gmail.com
Brian Sturgis	Assateague National Park Service	brian_sturgis@nps.gov
Shawn Ryan	MD Dept of Natural Resources	sryan@dnr.state.md.us
David Brinker	MD DNR	dbrinker@dnr.state.md.us
E.J. Chalabala	DE Center for the Inland Bays	restoration@inlandbays.org
Woody Francis	Army Corp of Engineers	woody.francis@usace.army
Carol Cain	MCBP	ccain@mdcoastalbays.org
Mary Phipps Dickerson	MD Dept. of the Environment	mphipps-dickerson@mde.state.md.us
Tony Pratt	DE Dept of Nat Resources & Envir. Control	Tony.Pratt@state.de.us
Joseph Kincaid	MDE Tidal Wetlands	jki8ncaid@mde.state.md.us
Darlene Wells	DNR/MD Geological Survey	dwells@dwells.state.md.us
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Agenda
Planning Workshop
Sediment Management in the Coastal Bays

Sponsored by the

Maryland Coastal Bays Program

September 16, 2010
Rm 201
Ocean City Convention Center
4001 Coastal Highway
Ocean City Maryland

9:00	Doors Open, coffee and doughnuts available
9:30 – 9:35	Dave Wilson, *Executive Director, Maryland Coastal Bays Program*
	Welcome
9:40 – 10:00	Roman Jesien, *Science Coordinator, MCBP*,
	Introduction, Background, Goals
10:00 – 1020	Darlene Wells, *MD DNR*
	Erosion and Sediment Loads
10:20 – 11:00	Evamaria Koch, *UMCES, Horn Point Laboratory*
	Submerged Resources
11:00 – 11:15	Break
11:15 – 11:30	Terry McGean, *Town of OC*
	Update: Dead End Canal Dredging
11:30 – 12:00	Dave Brinker, *MD DNR*
	Island Loss
12:00 – 12:15	Lunch (Provided)
12:15 – 13:00	Discussion Next Steps, Management Plan?

<u>Relevant Timeline:</u>

1995 MD Coastal Bays Admitted into NEP
1998 COE OC Water Resources Report
2000 CCMP Released
2004 State of the Bays Report
2005 Navigation and Dredging Planning Guide (Navigation and Dredging Advisory Group **NADAG**) for Maryland's Coastal Bays (met initially Dec 1999)

The **1998 COE Report** determined five Environmental Restoration Projects that were important to reverse degradation from agriculture, development, and erosion in the coastal bays. (http://mdcoastalbays.org/publications)

<u>The recommended environmental restoration plan includes</u>

1. Restore a total of 5 ha (12 ac) of salt marsh at the Isle of Wight Wildlife Management Area and
2. Restore a total of *3.4* ha (8.5 ac) of salt marsh at Ocean Pines,
3. Stabilize the eroding South Point Island to its 1997 size of approximately 0.93 ha (2.3 ac),
4. Construct a new 1.2 ha (3 ac) island in proximity to South Point to create vegetated habitat for colonial waterbirds, and
5. Create a 1.2 ha (3 ac) island near Dog Island that will be bare substrate with a shell surface for colonial waterbird nesting. The island created near Dog Island will also include three additional cells that will be available to local citizens, businesses, and government for the placement of material dredged locally. Thus, an additional 1.2 ha (3 ac) area of salt marsh will be added in the near future, and up to 8 ha (19 ac) area could eventually be created, increasing the size of this island to as much as 10 ha (25 ac).
Only Items 1 and 2 were completed. Should these projects be revisited?

NADAG Master Plan
(http://mdcoastalbays.org/files/pdfs_pdf/Dredging_Master_Plan_2005.pdf)
Recommendation
A.i.i. Support for and promotion of the beneficial use of dredged materials, including habitat restoration and creation. Beneficial Use Includes:

restoration of underwater grasses;
restoration of islands;
stabilization of eroding shorelines;
creation or restoration of wetlands; and
creation, restoration, or enhancement of fish or shellfish habitats.

A Navigation and Dredging Advisory Committee was formed but has not met since about 2003, should this committee be reformed?

Minutes

Dave Wilson, Executive Director, MD Coastal Bays Program

Oopened the workshop by welcoming everyone impressed upon the attendees a sense of urgency to develop a plan to place dredge spoil beneficially and expediently, hopefully to benefit of endangered bird species, while promoting local restoration projects rather than disposal of material in the land fill.

PRESENTATIONS:

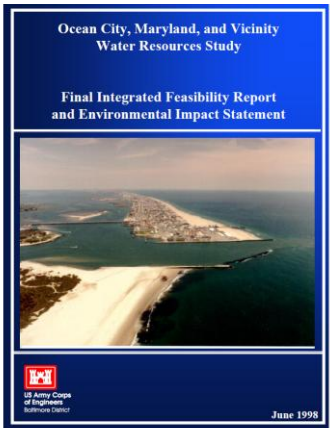
Roman Jesien, MD Coastal Bays Program http://mdcoastalbays.org/content/docs/Jesien.pdf. - Discussions at the MCBP Scientific & Technical Advisory Committee have outlined the need to review the work and recommendations of the Navigation & Dredging Committee and create a ecosystem based plan for sediment management in the Coastal Bays. Local issues of concern include island loss and restoration needs, navigation needs, habitat trade-offs and living shoreline requirements.

The overall goal of this workshop is to start a discussion which will lead to

- **Develop a sediment management plan that links material sources and project needs**
- **Determine if the Navigation Committee should be resurrected**
- **Determine how and if permits can be streamlined**

Background: Studies to date:

Ocean City Water Resources Study Feasibility Study (ACOE 1998): Sand management plan to implement navigation improvements and restore fish and wildlife habitat. This report is a compendium of environmental impact statements for dredge disposal sites and potential island creation in the coastal bays. The foremost recommendation was to supplement the sand starvation of northern Assateague Island.

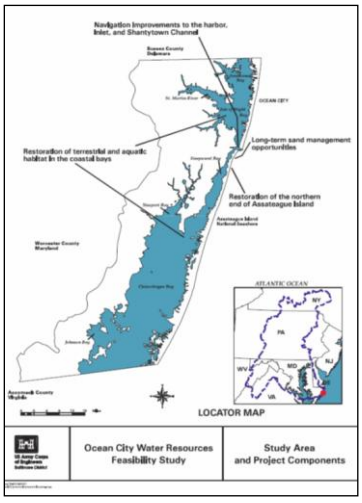


Projects completed to date:

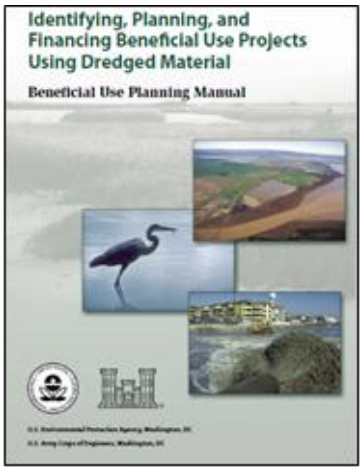
1. Restoration of northern end of Assateague Island
2. Restoration of 12 acres of salt marshy at the Isle of Wight Wildlife Management Area, and
3. Restoration of 8.5 acres of salt marsh near Ocean Pines

To be done:

4. Stabilize the eroding south point spoils island to its 1997 size of approximately 0.93 ha (2.3 acres).
5. Construct a new 3 acres island in proximity to South Point to create vegetated habitat for colonial waterbirds, and
6. Create a 3 acre island near Dog Island that will be bare substrate with a shell surface for colonial waterbird nesting. This island should also include 3 additional cells that will be available to local citizens, businesses and government for the placement of materials dredged locally. An additional 3 acres of salt marsh will be added in the future and up to 19 acres could eventually be created, resulting in a total size of up to 25 acres.



U.S. Army Corps of Engineers: Beneficial Use of Dredged Material
http://el.erdc.usace.army.mil/dots/budm/budm.cfm



This website provides information on the beneficial uses of dredged materials including the decision process, sediment types, agricultural & product uses, engineered uses and environmental enhancement benefits. Projects by state are presented as individual case studies. Maryland has 7 case studies, most of which are in the Chesapeake Bay watershed and were completed in the 1990's.

Navigation & Dredging Advisory Group (NADAG) for Maryland's Coastal Bays (1999 -2003) **Planning Guide**, edited by Cornelia Pasche Wikar, Chair August 2005
http://mdcoastalbays.org/files/pdfs_pdf/Dredging_Master_Plan_2005.pdf

The Maryland Coastal Bays Comprehensive Conservation & Management Plan (1999) outlined challenges facing the watershed. One of many needs that were identified was the challenge to improve coordination of navigation and dredging among local state and federal agencies (see pg 81 CCMP). A Navigation & Dredging Advisory Group was assembled to improve planning and coordination. The group met regularly from December 1999 until sometime in 2003. In 2005 a planning guide was produced, but implementation has stalled with the loss of the committee's chairperson. One of the recommendations from this guide support beneficial uses of dredged materials;

Recommendation: Ai.i. Support for and promotion of the beneficial use of dredged materials including;

- Habitat restoration & creation
- Restoration of underwater grasses
- Restoration of islands
- Stabilization of eroding shorelines
- Creation or restoration of wetlands, and
- Creation restoration or enhancement of fish or shellfish habitats

LOCAL SOURCES AND USES OF SEDIMENTS

Sediment sources in the coastal bays include the inlet, commercial harbor, Assawoman channel, dead end canals, the north end of Assateague Island and wind transport off of beaches.

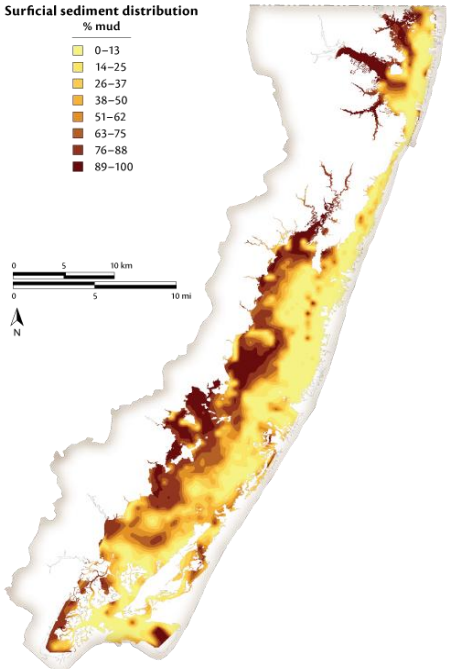
Use of sediments:

- Isle of Wight Wildlife Management Area marsh restoration using dredge material from the Assawoman channel.
- Carlson property (along the Thoroughfare) marsh protection & Sunset Island (Ocean City) via protection and enhancement behind low profile stone sills, along high energy shorelines,
- Herring Creek marsh creation along a low energy shoreline.

Background: Barrier Island Formation: Islands are ephemeral landscape features; sea level is rising as is erosion as a result. Flooding, inundation, storm events, winds and tides all affect island creation and erosion. In the coastal bays the features are well identified by trend lines along the coast: sand deposits resulted in topography most notable in the lower portion of the county where remnant ancient sand dunes are visible.

Mainland: high topographies and the degree to which sedimentation is able to offset submergence. Back barrier islands wash-over fans are due to shifts in inlets over time: in 1690 there were 11 known inlets, 1880 (7 inlets), 2000 (2 inlets). Each inlet created flood tidal deltas & ebb tidal deltas. Over-washes are due to hurricanes and high water events. Middlemoor Island is an example of an island that was created as the result of a flood tidal delta at Green Run Inlet.

Sediment distribution based on island dynamics; finer sediments are found on the west side of the bays, heavier sediments to the east.



Sea Level Rise needs to be considered in dredging scenarios. Most coastal areas are currently experiencing erosion, which is expected to increase in the future. The Barrier Islands along Delmarva are expected to undergo accelerated erosion and may find that the island migrate and/or will become segmented. See U.S. Climate change Science Program Synthesis and Assessment Product 4.1, Coastal Sensitivity to Sea Level Rise: A Focus on the Mid-Atlantic Region 2009. http://www.climatescience.gov/Library/sap/sap4-1/final-report/

Another local study was the Department of Natural Resources Sea Level Rise Response Strategy, Worcester County MD (Sept. 2008). This particular study looked at potential sea level rise scenarios, projected impacts, potential response options, and priorities for sea level rise response. http://www.dnr.maryland.gov/dnrnews/pdfs/Worcester.pdf

Why we are here: Workshop Goals

1. Review and update extent of dredging needs
2. Identify and explore capabilities and opportunities for dredged material management
3. Engage user groups and community in developing the sediment management plan
4. Develop a Sediment Management Plan for the Coastal Bays
5. Establish a committee to oversee, match, and traffic sediments, including;
    A. Identifying projects that generate sediments and projects that require sediments for various restoration needs.
    B. Permitting should be streamlined. Specific projects such as Skimmer Island restoration or the Dog Island site would be set up, ready to accept sediments; with permitting requirements in place. That way, when a dredging job, either private of public, comes along everything is ready to go. The only thing that would be needed is an assessment of the sediment texture and chemistry. If the sediment is mostly sand, then it should be good for island restoration or beach replenishment; if it's fine-grained, then it's good for wetland creation or maybe island restoration.

Sediment Management Plans have been developed in other coastal areas, including San Francisco Bay, Columbia River, Oregon, Great Lakes, and Jamaica Bay/Long Island NY and could serve as a model for the MD Coastal Bays sediment management plan.

DISCUSSION: A question was posed asking if sand had a 10% grain size requirement. Can finer sized dredge material be used in these projects? Darlene Wells indicated that smaller grain size is more erodible. Joe Kincaid: heavier grain sizes settle better leading to better project success. Engineered sand costs $300 per load. Run of the pit is less expensive 30-70% and can go through a 100 sieve. Future research need: what practical grain sizes are appropriate for projects to be structurally successful?

Comment: Make project materials to fit the water velocity, unconfined areas require heavier sediments.

From a regulatory perspective, standards are necessary to assure success, varying degrees of education and experience among consultants and property owners can result in sediment plumes and failed projects that can conflict with other properties and water uses.

Darlene Wells, MD DNR/MGS http://mdcoastalbays.org/content/docs/Wells.pdf presented information on Erosion and sediment loads in MD Coastal Bays

Sediment monitoring has taken place locally since 1991. Sources of sediments include

Transport form upland (stream input, run off)
Shoreline erosion
Transport from the ocean through inlets
Over-wash of barrier islands
Wind blown

Grain size ranges in scale from Gravel (>2mm in diameter) to Sand (2mm – 0.6mm) to Clay (<0.0039mm)

The distribution of sediments is controlled by the sediment source (upland and/or shoreline) and the level of energy to move the sediment. Basin geometry , hydrodynamic regime, climate and tidal range all affect energy and movement.

Gravel in not a major component locally. Sand is often found in higher energy areas, close to the original source and consists of predominately quartz with a heavy mineral component. Sinepuxent has a lot of mica which is easily suspended but settles out quickly. Silt is also proximal to the source, is wind transported and consists of abraded quartz and micas. Silt often is windblown from the barrier islands. Clay, relative to sand and silt shows a southward decrease in the bays. Clay is proximal to its sources; usually upland run off, stream inputs and shore erosion and is primarily made up of minerals. Clay has the highest correlation with nutrients and contaminants.

Geologic map: ironshire deposits disappear near Johnson Bay, this is interesting since Johnson Bay has poor water quality due to unknown inputs.

Sedimentation rates for the coastal bays;

Rate	Method	Location
0.26 cm/yr	210 Pb/137Cs	Rehoboth Bay (Chrzastowski, 1986)
0.57 cm/yr	210 Pb/137Cs	Indian River (Chrzastowski, 1986)
-0.04 cm/yr - 1.47 cm/yr	Bathymetric Change	Rehoboth/Indian River Bays (Chrzastowski, 1986)
0.105 - 0.180 cm/yr	14C - basal peat	Tingles Island (Bartberger and Biggs, 1970)
0.095 - 0.185 cm/yr	14C - basal peat	Pirate Island
0.35 cm/yr	210 Pb	Isle of Wight Bay (Wells and Conkwright, 1999)
0.14 ±0.02 cm/yr	210 Pb	Newport Bay (Wells and Conkwright, 1999)
0.33 cm/yr	210 Pb	Upper Chincoteague (near Public Landing)
0.17 ±0.08 cm/yr	210 Pb	Middle Chincoteague Bay (Johnson Bay area)
0.25 ± 0.14 cm/yr	210 Pb	Middle Chincoteague Bay (Johnson Bay area)

It appears that sedimentation is keeping up with sea level rise, possibly due to upland input.

Middle Chincoteague sediments are being reworked over and over again, lowest tide range among the bays due to sloshing around between the two inlets. Islands are eroding, but the sediments are moving about in the general area. Wetland migration can occur if room is available and sediments are amenable. Slope is the most important variable.

Nutrient budget: how much sediment comes from shore erosion?

Local cores and bluff sediment samples were analyzed for bulk density, grain size, total carbon, nitrogen & phosphorus and selected metals. Land loss was calculated over a 47 year period. Volume loss calculated as Kg/year. Developed shoreline not calculated. Linear erosion rate distance within the polygon, normalized as volume loss per year;

Basin/Area	Total Suspended Solids Loadings[1]		Sand
	Run off[2]	Shore Erosion	Shore Erosion
	Kg/yr x 1000	Kg/yr x 1000	Kg/yr x 1000
Assawoman Bay	1,919	2,152	1,054
St. Martin River	8,992	1,771	5,003
Isle of Wight Bay	4,184	956	516
Sinepuxent Bay	886	3,325	2,476
Newport Bay	8,778	2,758	929
Chincoteague Bay	10,388	15,949	11,448
Total	**35,147**	**26,910**	**21,426**

DISCUSSION: Mills island is eroding along the outside and interior. D Brinker: Hunting clubs are attributing interior island loss to snow goose populations. Geese are a nutrient source. Clastics are the mineral portion of sediments. Side cast islands were created in the 1930s.

How much comes across the island isn't known. How much sedimentation results from nor'easters? What is the critical grain size to support new SAV beds?

Evamarie Koch, University of Maryland Center for Environmental Studies, Horn Point Environmental Laboratory - http://mdcoastalbays.org/content/docs/Koch.pdf

Presented Submersed Resources: sediment management in the Coastal Bays. Her presentation was based upon her publication "Beyond Light: Physical, Geological and Geochemical Parameters as Possible Submersed Aquatic Vegetation Habitat Requirements" (Estuaries, Vol. 24, No. 1, p 1-17, Feb. 2001).

Eva and others questioned if sea grasses (a.k.a. Submerged Aquatic Vegetation or SAV) have a sediment habitat requirement. The group looked at sediment characteristics in vegetated versus unvegetated areas of the Isle of White Bay. They found that silt + clay levels above 35% seem to be limiting sea grass distribution.

Interestingly, these are the same requirements for clam aquaculture, thus SAV and clam habitat overlaps.

Shoreline retreat affects sea grasses and SAV by increasing turbidity. High turbidity results in less light and loss of SAV, loss of plant roots increases turbidity as well. Good sediments for SAV = sand, finer particles don't settle out and are easily re-suspended. Shoreline generated turbidity varies over space and time. Eddies of high turbidity will result in changes in light availability. Sun light penetration to less than 1.5 meters will limit SAV growth. Turbidity peaks with each flood tide and storm event. Also, high turbidity events have been noticed in areas with breakwater structures. Sediments are re-suspended behind the sill. Sand behind the sills would cap the fine sediments. Sand bars are different, however. Deposition of sand caps the fine sediments. Breakwaters exacerbate turbidity. It is estimated that a 7 year window is needed for finer organic matter to settle out before the substrate will support plant growth.

As sea level rises, marshes become stressed and SAV may move landward if the preferred sediments are availabe to colonize. For example, Mills Island in Chincoteague Bay has less peripheral SAV because marsh erosion in the sub tidal area has eroded down to compacted peat - SAV cannot grow on that type of sediment. The fine grain substrate is continually re-suspended and there is little or no seed recruitment. The seeds are carried away by currents and waves before they can be buried since sand (a heavier grain size) isn't readily available. Additionally, SAV rhizomes don't penetrate peat. Muddy areas have less root biomass below ground and high energy pulls the plants out of the substrate.

SAV growing in sandy substrate has less above-ground leaf biomass and more root biomass.

- Low energy and sandy substrate = SAV with long roots
- High energy and sand = SAV with long roots
- Muddy substrate and low energy = plants are ok but exist with short roots
- High energy and mud = a lot of drag occurs on leaves, plants are easily pulled out of the substrate.

Sand eroding from ancient sand dunes are supporting eel grass beds near Mills Island.

How thick does the sand have to be? This can be quantified as shoots/sq meter verses sand layer thickness. Areas with less than 2 cm do not support SAV growth. Eva hypothesized that not enough sand is available to hold down the peat and organics during storm events, thus causing re-suspension.

Conclusion: **sand is of the essence for SAV in the Coastal Bays**. Sand can be used to restore compacted peat areas where SAV are no longer growing….but the sand needs to be stabilized so that little erosion will occur or a supply of sand can be placed near-by to serve as a supplement to the beds. Additionally, it is important to recognize that shoreline hardening prevents marsh and sand migration and results in a loss of SAV.

DISCUSSION: Are living shorelines beneficial or detrimental to SAV? Eva: it appears to be beneficial. If rip rap prevents sand movement, SAV is not usually present. Living shorelines act as a filter for finer sediments and as such support SAV growth.

S. Taylor: Has re-suspension been seen at Carlson's? or at the Isle of Wight marsh restoration?

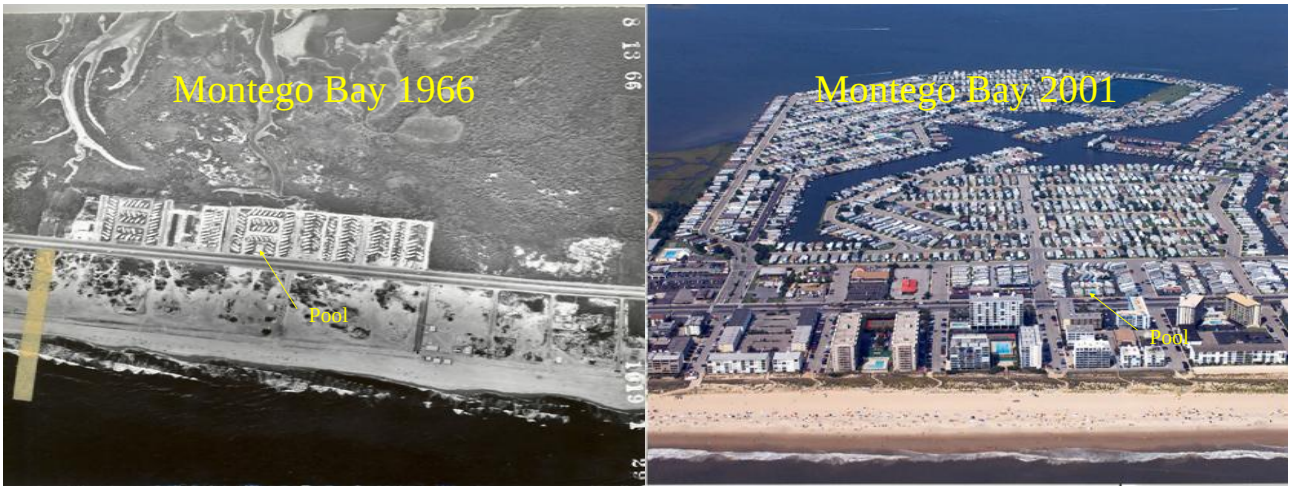
Problem for regulatory folks- right to protect property, maintenance costs. Managers and policy makers could develop a policy to provide tax breaks to property owners who allow for sand sources on their land.

Woody: how to balance property protection with maintenance requirements? How about navigation channels? How can we project how sand will move and be assured that it won't result in user conflict later?

How does beach replenishment affect SAV growth? Cradle to grave sediment distribution? Look at it from an ecosystem approach. Look at mitigation strategies that are built into the permit process. (DE)

Terry McGean, Engineer, Town of Ocean City http://mdcoastalbays.org/content/docs/mcgean.pdf

Presented information on town dead end canals. There are 64 canals in Ocean City, the longest is approximately 4,400 linear feet. Most were created in the 60s and early 70s. Bulkheads were built in wetlands or in the water, then canals were dredged and the spoils were used to create land for development.



Issues that require remediation include:

- Siltation (usually at the mouth and end),
- Pollution,
- Low dissolved oxygen / flushing
- Lack of ownership / responsibility for upkeep and maintenance.

Who is responsible for Town canals?

Ocean City Code Section 106-44 states *"The owner of any real property abutting landward or channelward of any canal, lagoon, basin or other waterway shall maintain said water…."* The code also contains a provision for the costs to be allocated based on the benefactors of any maintenance project.

The process to have a canal dredged was lengthy, requiring petitions to the Mayor and Council, a Port Warden environmental impact study, multiple public hearings, permitting and property owner permissions, payment for design, engineering and permits, etc. As a result of this process, only one canal has been dredged in the past 20 years, by a group of homeowners along Loop Road.

Steps Ocean City is currently taking include much stronger and creative approaches to private stormwater management during new construction and redevelopment, street inlet and outfall retrofits to reduce run off pollution, and a program to encourage stormwater disconnects for existing construction.

During 2005 – 2006 the Dept. of Natural Resources surveyed every canal and provided the results to the Town. These results were tabulated to calculate the average depth of each canal and a priority ranking (scale 1-5) for maintenance. In 2008, the City Council changed the code to take control over dredging and authorized a (yet to be funded) canal maintenance program. As of April 2009 Phase 1 canal dredge permits had been submitted.

Canal Ranking based on average depth	Maintenance Priority
1 – avg. depth <than 2 ft	1. 3 canals
2- avg. depth 2-3 ft	2. 11 canals
3- avg. depth 3-4 ft	3. 18 canals
4- avg. depth >4 ft	4. 17 canals
5- all depths >4 ft	5. 11 canals (4 other canals surveys have no current marine based use)

Proposed dredge program:

- Established an authorized minimum depth of 3 foot, much like Ocean Pines
- Bring all canals to a minimum depth of 3 feet, dredging to a 4 foot depth to allow for in-fill
- Canals are grouped together based on depth ranking and geographic proximity
- Bulkheads along canals are scheduled for dredging must be in good repair.

Phase 1 canals are identified as:

Year 1-2 Hitchens/Trimper, 52nd, 25th and 24th streets
Year 2-3 Old Landing South Channel, Old Landing /Winter Harbor, Old Wharf/Channel Buoy, Winter Harbor/Old Wharf
Year 3-4 Tern/Plover, 53rd/54th, Tern East Channel.

Total volume estimated at 38,000 cubic yards.

Private slips:

City will only pay to dredge a public channel in each canal.
There are private boat slips along every canal that may also need to be dredged
These are included in the permit application
Will allow property owners to 'piggy-back' on the dredge contract at their cost + waiver

Total volume is estimated at 10,000 cubic yards

Phase 2: After 2-3 years, the next tier canals will be re-assessed for Phase 2 and beyond. Canals include: Loop Road, Seaward/Windward, Peach Tree, Salt Spray/Dory Finger, Sea Captain/Laurel, and Jamestown Road.

Proposed disposal sites

Phase 1
Beach for best material which offers unlimited capacity (possibly 20,000 cubic yards)
Fill Northside Park Lagoon to -5 feet (15,000 cubic yards)
County landfill for poor material, limit based on county needs (5,000 cubic yards)

Future sites: beach / landfill

Re-establish wetland mitigation island at Loop Road (139th street) This is the dredge disposal area of the only canal dredge project that has occurred to date. A marsh complex was created, however the island has settled and most of the vegetation is gone.

Private West OC wetland mitigation sites identified by Coastal Bays – ex. Carlson project

Dog Island future Corps Project – no OC money available at this time

Current status of the dredging program:

- Maintenance dredging of some outfalls was added to the permit (1,000 cubic yards).
- The permit process is on going
- Bulkhead evaluations were completed
- Council has yet to include any funding for this work nor to determine a funding source
- Disposal sites for material that is not suitable for the beach will be critical for future phases.

DISCUSSION: *The overall projected dredging need is estimated to be 15,000 cubic yards per year for 15 years, a total of 225,000 cubic yards.*
Can any of the material be used for SAV? Suitability would need to be determined. Permit is for phase one only, a 3-5 year timeframe. It does not include all the canals.
Can sand not suitable for the beach be used for island and soft shoreline projects?
A formula or understanding of a concept that would serve OC and other issues should be an outcome of this workshop.
2 schools of thought: tax waterfront property owners, however these owners are already assessed highly, or the County must decide how to pay for the program.
Perhaps reserve some high grade sand to be used as a cap over finer grain sediments.

David Brinker, MD Department of Natural Resources http://mdcoastalbays.org/content/docs/Brinker.pdf

Presented information on Waterbirds and Island Loss with a set of goals to summarize the natural resource problem, discuss possible management actions, seek win-win solutions to a difficult problem, and use dredged sediments to benefit local resources of conservation interest.

Colonial nesting water birds can be thought of as a "selfish herd" with social benefits and are a resource rarity.

Endangered barren sand island nesting birds include: Black Skimmer, Gull Billed Tern, Least Tern, Royal Tern, Piping Plover, and Wilson's Plover. Other species of concern include the Common Tern (declining), Roseate Tern (extirpated) and the Sandwich Tern (rare).

Waterbird conservation plans have been written based on species conservation priority status. For more information see ***Waterbird Conservation for the Americas***: Mid Atlantic/New England /Maritimes region: Northeast Coordinated bird monitoring. http://www.waterbirdconservation.org/pubs/complete.pdf

Waterbird Conservation Plans		
Species Conservation Priority Status		
	North American Plan	Regional Priority
Black Skimmer	High	Highest
Common Tern	High	Highest
Gull-billed Tern	High	Highest
Least Tern	High	Highest
Royal Tern	Moderate	High

- Royal Terns: no nests were counted in the mid 80s, counts peaked around 2000 with more than 600 breeding pairs, and are now falling to less than 300 breeding pairs.
- Black Skimmers are also declining; during late 80s over 300 breeding pairs were found in the Coastal Bays, numbers declined in 2006 to 5 pairs, currently there are 20-25 pairs. This species is at serious risk of extirpation.
- Common Tern example: 2,500 in mid 80s, down to 500 pairs now.

These species are at risk because their nesting habitats, islands, are disappearing. Birds are dependent on these islands that have few mammalian predators for secure nesting. Human changes to coastal barrier process in MD (ex. No breaches in MD barrier islands over the past 40 years) have affected the natural accumulation of sand and thus island creation.

Studies have documented the need for habitat improvement and the decline in waterbird populations

> 1998 Ocean City Water Resources Plan
> 2007 Brinker et al Waterbirds Brinker DF, McCann JM, Williams B, Watts BD (2007) Colonial nesting seabirds in the Chesapeake Bay region: where have we been and where are we going? In: Erwin RM et al. (eds.), Waterbirds of the Chesapeake Bay and vicinity: harbingers of change? Waterbirds 30 (special publication 1), pp. 93–104.
> 2010 Erwin et al. Journal of Coastal Conservation (R. Michael Erwin & David F. Brinker & Bryan D. Watts & Gary R. Costanzo & David D. Morton. 2010. Islands at bay: rising seas, eroding islands, and waterbird habitat loss in Chesapeake Bay (USA).
> http://chesapeake.usgs.gov/pdfs/ErwinETAL-JCoastalCons-2010.pdf.

Meanwhile….island loss continues. Of the 33 islands created in the 1930's by sidecasting dredge spoils, South Point Spoils is the last remaining island. This island was the first place that pelicans were breeding in 1987 in the state of MD. Today, 30-40% of the land mass has eroded.

The OC Water Resources Study recommended creating bare substrate islands for beach-nesting colonial waterbirds. Table 5-1 lists restoration needs and relative significance and scarcity;

Table 5-1: Restoration needs and relative significance and scarcity of habitats proposed for restoration efforts.

Objective	Restoration Need	Habitat Scarcity	Habitat Significance
Create bare-substrate islands for beach-nesting colonial waterbirds	10's to 100's of acres	Rare	Very Great
Maintain island habitat for vegetation-nesting colonial waterbirds	<10 acres	Uncommon	High
Restore/create salt marsh	100's to 1000's of acres	Common	High
Restore/create forested wetlands	100's to 1000's of acres	Common	High

Islands are being created elsewhere successfully: Wilmington ACOE District summary lists pros and cons of using dredged material as a tool for management of Tern and Skimmer nesting habitats. http://el.erdc.usace.army.mil/elpubs/pdf/doere24.pdf Some projects are unconfined, others use effluent control methods.

DISCUSSION: Identifying opportunities for island restoration and habitat creation for waterbirds should be a priority in all Atlantic coast states. Success depends upon cooperation among many regulatory and resource agencies, non-governmental organizations and other stakeholders. USACE Districts with operations affecting waterbirds should develop cooperative agreements and memorandums of understanding with state and federal resource management agencies to maximize natural resource benefits from dredged material disposal.

Skimmer Island: the Corps interest is to identify the source of material, ability to withstand forces upon it, and how will it affect Hoopers if it is uncontained? What is the overall sediment budget for the bay? Corps also is concerned how sand management may exacerbate existing navigation problems.

How do deal with the western side of Skimmer to maintain the channel? Can this group determine how to maximize the project to maintain navigation, create island habitat and support SAV beds.

Containment increases the costs but may be necessary to prevent navigational conflicts. How will the future Rt. 50 bridge affect Skimmer and local navigation? The Corps in not opposed to island creation – it is the potential for other conflicts.