CONNECTICUT COASTAL MANAGEMENT MANUAL

SECTION 3

COASTAL USES

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Office of Long Island Sound Programs
Fact Sheet
for
GENERAL PUBLIC ACCESS TO COASTAL WATERS

What is General Public Access to Coastal Waters?

General public access to coastal waters, as used in the statutory definition of "water-dependent uses" [see fact sheet for *Water-Dependent Uses*], are uses or facilities which provide for recreational use or enjoyment of coastal waters and/or their adjacent shoreline by the general public. General public recreational use and enjoyment includes, but is not limited to: fishing, hiking, boat launching, birding or wildlife observation, and general passive enjoyment of scenic waterfront coastal views and vistas.

When is it most appropriate to incorporate public access into a waterfront development proposal?

As required by the Connecticut Coastal Management Act (CCMA) waterfront sites should, in most instances, be developed with water-dependent uses, unless site specific characteristics prevent such use. In an instance where a site is inappropriate for more active water-dependent uses, such as marinas, the creation or enhancement of public access should be a priority. (See *Fact Sheet for Water-dependent Uses* for more information.)

Generally, coastal public access should be provided where appropriate as a stand-alone water-dependent use and at any waterfront site proposed for non-water-dependent use to make the project consistent with the water-dependent use policies of the CCMA and to mitigate unacceptable adverse impacts of the proposed development on future water-dependent development opportunities. The acceptability of potential adverse impacts should be evaluated based upon a consideration of the:

- site's unique characteristics including its potential to accommodate a water-dependent development or use;
- effects of the proposed non-water-dependent use on possible future water-dependent development opportunities; and
- consistency of the proposed use with applicable CCMA policies and goals.

The degree to which potential adverse impacts to future water-dependent development opportunities are created by a proposed non-water-dependent use should be determined based upon a consideration of the amount and characteristics of the shoreline proposed to be developed for non-water-dependent uses and the intensity of such use. The following list of potential public

access opportunities and constraints should be considered in determining the type and extent of coastal public access appropriate for the site:

- general site topography including site elevation and contours;
- on-site or adjacent safety hazards;
- water depths;
- presence of sensitive coastal resources and the need to protect them;
- community coastal recreational facility needs;
- neighborhood privacy concerns; and
- views from the site.

Can a commission legally require coastal public access as a condition of coastal site plan review approval?

Yes, when necessary and appropriate to satisfy the water-dependent use requirements of the CCMA. The statutory language found within the CCMA authorizes a municipal planning and zoning commission to require the provision of coastal public access as a condition of coastal site plan approval for the otherwise non-water-dependent use of a waterfront site. This has been confirmed by the Connecticut Supreme Court in the decision DeBeradinis vs. Zoning Commission of the City of Norwalk 228 Conn. 187**.** The Court also found that the imposition of a requirement to provide public access at a site proposed for a non-water-dependent use was <u>not</u> an unconstitutional taking of private property without just compensation.

What is the process for evaluating and siting coastal public access facilities?

<u>General Site Evaluation</u>

- Get a sense of the site - is there potential for providing meaningful public access?
- Confirm information shown on the site plan (e.g., drainage, solar orientation, slopes, soils, hazards).
- Identify existing or potential site attractions (e.g., scenic view, water depths for fishing/boat launching, surficial geology-sandy beach or rocky shorefront).
- Is there evidence of existing public use at the site (e.g., foot paths)? If none, contact local potential user groups (e.g., birding or kayak clubs) to evaluate site's potential.
- Is there enough space to separate public from private use of the site? If not, redesign the project to accommodate public access.
- Are there significant public safety concerns?
- Can site safety constraints and coastal resource protection concerns be overcome through appropriate design (e.g., pedestrian overpasses, fencing, security lighting, etc.)?

- Can the proposed development be redesigned, if necessary, to better accommodate public use?

Locate and Map Potential Site Activity Nodes

- Identify areas appropriate to public and private uses, including areas for parking and access to the site.
- Develop linkages between public use areas and site access points; locate attractions to draw the visitor to the site from a public street or parking area.
- Identify and locate appropriate barriers to separate public from private areas (e.g., fencing, landscape screening).
- Identify links to off-site public areas (e.g., public parks) and barriers to adjacent incompatible uses (e.g., railroads).

Site Signage

- Provide signage design and wording details (e.g., open dawn to dusk) and indicate sign locations. Generally, signs should, at a minimum, be located at the street entrance to the site and, if somewhat distant from the entrance, at the parking area(s). Additional directional signage should be considered if the access area is remote and not obvious from the street entrance.
- Develop a town-wide signage program to promote uniform signage and special sign components (e.g., directional arrows) and to provide prefabricated signs. Prefabricated universal coastal public access signs are also available through the DEP's bookstore.

Administrative and Legal Items

- To ensure implementation and maintenance of public access component(s), condition coastal site plan approval to specifically require:
    - general public access component(s) as a separate, enforceable condition of approval, even if shown on developer's plans. The formal decision should include description of the public access components.;
    - recorded public access easements on land records to ensure permanency of access;
    - maintenance of the public access area and associated amenities and establishment of a mechanism to provide such maintenance (e.g., create a homeowners association public access area maintenance account);
    - public access areas and linkages be built before issuing building permit(s) or certificate(s) of occupancy for the non-water-dependent components of the site development; and
    - applicants to post performance bonds or escrow accounts, as authorized by CGS section 22a-107, to ensure that coastal public access facilities are constructed.

- Perform follow-up inspections to ensure the access facilities are properly constructed and associated easements are filed prior to issuing certificate(s) of occupancy for the non-water-dependent components of the site development and periodic inspections to ensure facilities are properly maintained.

Note: CGS section 52-557f relieves private property owners of liability for injury in most instances when they provide public access on private lands at no charge.

What are the principles of coastal public access site design?

- Make the visiting public feel comfortable and welcome (methods: signage, amenities such as benches, trash receptacles, lighting and parking, if appropriate).
- Separate the public and private portions of the development (methods: plantings, fences, adequate space between public and private activity nodes).
- Design to attract and retain public use of access area (methods: provide sufficient space and amenities such as seating, trash receptacles and parking, if warranted).
- Promote a sense of visitor safety from on- and off-site hazards such as dogs, privacy conscious neighbors, industrial activities (methods: provide lighting, limit access from dawn to dusk except for fishing access, orient site away from visual distractions, provide vegetated buffers).
- Make access to area easy (methods: on or near site parking; connect site walkways to public sidewalks, provide gentle slopes).

What can a municipality do to promote coastal public access?

- Amend the Plan of Conservation and Development and Municipal Coastal Program, if applicable, to specifically identify both areas where coastal public access is particularly needed and the types of access facilities in greatest demand.
- Amend the zoning regulations to specify municipal authority and criteria to specifically require water-dependent uses including coastal public access through the coastal site plan review process, as already provided in the CCMA.
- Direct applicants for waterfront projects to meet with town planning and zoning staff prior to formal application for coastal site plan review approval to review the CCMA's water-dependent use requirements. The purpose of such meetings should be to explore whether a site is suitable for active water-dependent uses, and if not, how proposed non-water dependent uses of waterfront sites could be modified to incorporate meaningful water-dependent use components. Such meetings could also address concerns about the perceived effects of providing coastal public access (i.e., public access can be designed at "neighborhood scale"; time of access limited to dawn to dusk except where fishing access is appropriate, landowner liability is limited by statute, etc.).
- Make this fact sheet available to the public and the planning and zoning office.

Office of Long Island Sound Programs
Fact Sheet
for
SEPTIC SYSTEMS

What are Septic Systems?

The purpose of an on-site subsurface sewage treatment and disposal system, commonly known as a septic system, is to treat domestic sewage from a residential, commercial, or in some cases, industrial use in order to prevent contamination of nearby ground and surface waters. Septic systems generally provide adequate treatment of domestic sewage as long as they are properly located, designed, installed, operated and adequately maintained.

How do septic systems work?

A septic system has two basic working parts

1) SEPTIC TANK

Domestic sewage flows from the house or other building into the septic tank. Solids settle and are partially decomposed by bacteria to form sludge. Grease floats to the top forming a scum layer. Generally, this material (septage) is what is pumped out when a septic system is cleaned.

2) SOIL ABSORPTION FIELD

Partially treated domestic sewage is discharged from the septic tank into an absorption field. Here, the water is further purified by filtration and decomposition by microorganisms in the soil.

What harm can a septic system do?

The potential for contamination of coastal waters, ground water and surface waters exists when any of these factors are neglected. Septic systems must be located in suitable soils and adequately set back from wells, watercourses, and wetlands among other requirements. Otherwise, they can pose a public health risk and result in water contamination. Failing or improperly sited or designed septic systems may contribute to water quality problems as a result of both pathogens (disease-causing microorganisms such as bacteria and viruses) and nutrients (excessive levels of nitrogen and phosphorus which can cause algal blooms and low oxygen conditions). Toxic contaminants can also be a problem when systems are used improperly. In the past along Connecticut's coast, it has been common to site septic systems in coastal areas on small lots with inadequate separation distances to groundwater or bedrock, or on very sandy soils with poor renovation capacity which has lead to pollution of coastal surface and ground waters.

What can I, as a municipal official, board, commission or resident do to promote wise septic system use?

- Remember that each new residential or small commercial septic system constructed in the state must be located, designed, installed and operated in accordance with the *Connecticut Public Health Code*. Municipal directors of health are responsible for ensuring that new systems meet the health code and its standards.
- Familiarize yourself with the basic septic system setback requirements (from ledge, water table, wells, open watercourses) and minimum criteria of the *Connecticut Public Health Code*. Ask your health official for information-- if something doesn't look right to you, ask questions.
- When reviewing a coastal site plan or zoning proposal, with proposed or modified septic systems, direct your concerns and questions to your local health official or Connecticut Department of Public Health Services. In addition to the state water quality standards, remember the Connecticut Coastal Management Act has specific criteria that must be considered during review of coastal site plan review applications to protect water quality, tidal wetlands, coastal resources and prevent non-point source pollution from septic systems.
- Ask that all pertinent septic system information be placed on site plans (septic system location, basis of design, test hole data, percolation rates, etc.).
- Keep in mind that failing septic systems are also considered a non-point source of pollution which needs to be addressed under Connecticut's Coastal Non-Point Source Pollution Control Program.
- Encourage septic system owners to know the location of their septic systems. Often the local health department or septic tank service companies have information regarding specific systems, or a septic system owner can trace the direction the sewer pipe goes from the basement or look for areas where the grass does not grow well, remains green throughout the summer when other portions of the lawn browns due to lack of water, or where a leach field area may be slightly depressed or raised.
- Don't plant trees or shrubs over your septic area.
- Encourage septic system owners to pump out their septic tanks regularly. Consider passing a municipal ordinance to require periodic pumping.
- Develop and distribute fliers around town describing the importance of proper siting, soil testing and maintenance of septic systems.
- Protect the absorption field by keeping automobiles and heavy equipment off of them.
- A septic system does not need to have anything added to it to function properly. Water

softener and conditioner backwash should not be discharged to a septic system.

- Eliminate the use of garbage disposals and phosphate-based detergents.
- Don't put substances such as motor oil, gasoline, paints, thinners and pesticides in drains. While moderate use of household cleaners will do little harm, other substances such as fats, grease, coffee grounds, paper towels, disposable diapers, etc. may clog your system.
- Keep a maintenance record of your septic system to aid in anticipating when the next cleaning may be needed.
- Plant a greenbelt between your absorption field and the shoreline.
- If you are building a new septic system, construct the system as far away from tidal and inland wetlands and the shoreline as possible.
- Call your local health official if your system fails. Exercise caution near an opened septic tank (it may contain toxic and explosive gases) and fence off the area.
- Repair and upgrade improperly functioning systems. Retrofit plumbing fixtures with water conservation units. Fix leaking fixtures. Don't direct sump pumps or floor drains to septic systems.

Additional resources and publications

The Connecticut Department of Public Health Services,
Capitol Avenue, Hartford
860-509-7296
Connecticut Public Health Code
Design of Subsurface Sewage Disposal Systems for Households and Small Commercial Buildings

The Connecticut Department of Environmental Protection

Maps and Publications Office, 79 Elm St. Hartford
860-424-3555
Septic Systems Manual: A Guide to On-Site Subsurface Sewage Disposal for Local Land-Use Officials
Seepage and Pollutant Renovation Analysis for Land Treatment, Sewage Disposal Systems

Office of Long Island Sound Programs- 860-424-3034
Coastal Water Quality Protection: A Guide for Local Officials

Office of Long Island Sound Programs
Fact Sheet
for
SEWER AND WATER LINES

What are the concerns regarding sewer and water lines in the coastal boundary?

People love to live and play on and near Connecticut's shore. Many areas along the shore have historically been developed within flood prone areas on or near beaches and tidal wetlands. The pressure continues today to develop any remaining lands. The provision of sewer or water lines to areas previously deemed undevelopable due to the inability to accommodate septic systems or wells, can lead to more people being subject to flood hazards and increase potential adverse impacts to coastal resources from development. The establishment of new sewer and water lines sometimes leads to whole-sale increases in allowable densities or impervious coverage previously limited by septic capacity. This overall development pressure can sometimes result in increased conversions of seasonal cottages to year-round dwellings and impacts to on-site or nearby beaches, dunes, tidal wetlands, and water quality.

What are the statutory policies that apply?

> To disapprove extension of sewer and water services into developed and undeveloped beaches, barrier beaches and tidal wetlands except that, when necessary to abate existing sources of pollution, sewers that will accommodate existing uses with limited excess capacity may be used [Connecticut General Statutes (CGS) section 22a-92(b)(1)(B)]
>
> To locate and phase sewer and water lines, so as to encourage concentrated development in areas which are suitable for development [CGS section 22a-92(b(1)(B)]

Additionally, the Connecticut Coastal Management Act's (CCMA) planning goal regarding sewer and water line extensions is to encourage development in areas which are suitable and prevent flood-prone and resource intensive areas from becoming developable or developed at a higher density. It is important to keep in mind that CCMA policies allow extensions only under limited conditions.[1]

Under what circumstances can sewer and water lines be extended?

When they are required to abate existing sources of pollution. However, even in such cases, the extension should accommodate only existing uses with limited excess capacity so as to minimize the potential for additional development in the sensitive resource area and prevent "tie-ins" to the system.

What can the municipality do to minimize impacts associated with sewer and water line extensions?

- Update municipal plan of conservation and development, municipal coastal program, if applicable, and zoning and subdivision regulations to establish criteria to identify sewer avoidance areas and promote development in appropriate areas outside beaches, barrier beaches, tidal wetlands, and other flood hazard areas.

- Develop and implement a sewer avoidance program.

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[1] State funds used for sewer and water line extensions generally carry the same limitations on where and under what circumstances they can be extended.

Office of Long Island Sound Programs
Fact Sheet
for
SHORELINE FLOOD & EROSION CONTROL STRUCTURES

What are Shoreline Flood and Erosion Control Structures?

The Connecticut General Statutes (CGS) defines shoreline flood and erosion control structures as:

> any structure the purpose or effect of which is to control flooding or erosion from tidal, coastal or navigable waters and includes breakwaters, bulkheads, groins, jetties, revetments, riprap, seawalls and the placement of concrete, rocks or other significant barriers to the flow of flood waters or the movement of sediments along the shoreline [CGS section 22a-109(c)].

What are the statutory policies that apply?

To manage coastal bluffs and escarpments so as to preserve their slope and toe [CGS section 22a-92(b)(2)(A)]

To discourage uses which do not permit continued natural rates of erosion [CGS section 22a-92(b)(2)(A)]

To disapprove uses that accelerate slope erosion and alter essential patterns and supply of sediments to the littoral transport system [CGS section 22a-92(b)(2)(A)]

To preserve the dynamic form and integrity of natural beach systems in order to provide critical wildlife habitats, a reservoir for sand supply, a buffer for coastal flooding and erosion, and valuable recreational opportunities [CGS section 22a-92(b)(2)(C)]

To insure that coastal uses are compatible with the capabilities of the beach/dune system and do not unreasonably interfere with natural processes of erosion and sedimentation [CGS section 22a-92(b)(2)(C)]

To promote nonstructural solutions to flood and erosion problems except in those instances where structural alternatives prove unavoidable and necessary to protect existing inhabited structures, infrastructural facilities or water-dependent uses [CGS section 22a-92(b)(2)(F)]

To maintain the natural relationship between eroding and depositional coastal landforms [CGS section 22a-92(b)(2)(J)]

To minimize the adverse impacts of erosion and sedimentation on coastal land uses through the promotion of nonstructural mitigation measures [CGS section 22a-92(b)(2)(J)]

Structural solutions are permissible when necessary and unavoidable for the protection of infrastructural facilities, water-dependent uses, or existing inhabited structures, and where there is no feasible, less environmentally damaging alternative and where all reasonable mitigation

measures and techniques have been provided to minimize adverse environmental impacts [CGS section 22a-92(b)(2)(J)]

What are the concerns regarding shoreline flood and erosion control structures?

Shoreline flood and erosion control structures are generally proposed for areas such as beaches and bluffs, which can experience erosion in the presence of significant wave action. However, the placement of these structures in such sensitive and dynamic areas usually causes adverse impacts to adjacent properties, exacerbates the erosion problem rather that eliminating it, and can cause significant adverse impacts on the resources themselves.

When waves break on a gently sloping sandy beach, their energy is gradually absorbed by the beach. In contrast, when waves encounter a solid structure, such as a seawall, placed parallel to the shoreline, their energy is not absorbed, but rather it is redirected in all directions along the face of the structure. Energy directed downward can cause erosion or scouring of sediments or wetland vegetation at a structure's base, allowing even greater wave energy to reach the structure because of increased depth of water, eventually undermining the structure and causing its collapse. In addition, waves directed upward over the wall often severely damage or destroy the very structure the wall was placed to protect. Further, wave energy focused by a hardened shoreline can result in faster-than-normal erosion of nearby sediments and vegetation, potentially resulting in the rapid loss of neighboring waterfront property.

Shoreline flood and erosion control structures, such as groins or jetties, placed perpendicular to a beach are intended to interfere with the natural transport of sand along the shoreline. Sand continues to move away from the groin in the downdrift direction but is blocked from passing the groin on the opposite side, resulting in the accretion of sand on one side but also the loss of sand from the opposite side.

In addition, the placement of a flood and erosion control structure in a beach environment eliminates the upland as a source of sediments for beaches in the system and often accelerates erosion due to a lack of replacement sediment. This results in a narrowing of the beach since currents continue to transport sediment offshore and along the shore. Further, the structure prevents the beach from migrating landward as it would naturally tend to do. The combination of structure-induced scour and the cutting off of the sediment supply can cause dramatic changes in beach contour in a relatively short time.

What are the adverse impacts associated with shoreline flood and erosion control structures?

The CCMA defines adverse impacts which must be avoided or, if avoidance is not possible, must be minimized in order for a project to be lawfully approvable. From a resource perspective, shoreline flood and erosion control structures can have the following adverse impacts on valuable features and functions of shoreline areas and coastal resources:

- eliminate natural buffer for coastal flooding and erosion
- alter natural rates of erosion and sedimentation
- interrupt sand supply
- reduce valuable recreational opportunities
- destroy critical wildlife habitats
- detract from the visual quality of a natural shoreline

Any proposals for such structures must be carefully evaluated, and non-structural erosion control alternatives such as vegetative stabilization to stop or slow down any erosion and/or flooding problems

should be promoted. (For more information, please see the *Fact Sheet for Adverse Impacts*.)

When are shoreline flood and erosion control structures generally consistent with the Connecticut Coastal Management Act?

The Connecticut Coastal Management Act (CCMA) contains strong policies that discourage the placement of shoreline flood and erosion control structures except in those limited instances where they are deemed necessary and unavoidable to protect the following:

- water-dependent uses as defined in CGS section 22a-93(16);
- infrastructural facilities (e.g., roads and sewer and water lines); and
- inhabited structures built prior to implementation of the CCMA (January 1, 1980).

However, there must be a clear and compelling demonstration that there is a threat from erosion and that nonstructural erosion controls are not viable alternatives. Nonstructural approaches include relocation and elevation of at-risk buildings, vegetative stabilization with native plantings, dune creation or enhancement, and temporary placement of sandbags.

Protective structures are not allowed for newer residential structures because any residential structure built after the effective date of the CCMA and in compliance with its goals and policies should have been placed sufficient distances from coastal waters, thereby obviating the need for shoreline flood and erosion control structures.

What are the requirements for action on a shoreline flood and erosion control coastal site plan application?

- A copy of each coastal site plan submitted for any shoreline flood and erosion control structure (including those proposed as a component of a larger development project) must be **referred to the DEP within 15 days of its receipt** by the zoning commission. [CGS section 22a-109(d)]
- The DEP may comment on such plans; any comments must be submitted to the zoning commission within 35 days of its receipt at the DEP. [CGS section 22a-109(d)]
- The zoning commission must consider any DEP comments prior to final action on the application. [CGS section 22a-109(d)]
- If the DEP does not comment within the 35-day time frame or any extension granted by the zoning commission, the commission may take final action. [CGS section 22a-109(d)]
- The commission may hold a hearing on a shoreline flood and erosion control structure, and must hold a hearing upon the request of the commissioner of environmental protection. [CGS section 22a-109(e)]

A copy of any decision on a coastal site plan for a shoreline flood and erosion control structure shall be sent to the commissioner of environmental protection within 15 days after such decision is rendered. [CGS section 22a-109(f)]

Does the DEP regulate shoreline flood and erosion control structures?

Maybe, depending on the specifics of proposed activities. The Department of Environmental Protection (DEP) has direct regulatory jurisdiction over activities occurring in tidal wetlands and/or waterward of the high tide line. If any construction activities or structure(s), in part or in whole, or any incidental work proposed in conjunction with the construction of structure(s) is proposed at or waterward of the high tide line or in tidal wetlands, authorization from the DEP's Office of Long Island Sound Programs would be required prior to construction in accordance with the Tidal Wetlands Act (CGS sections 22a-28 through 22a-35) and/or the statutes governing the placement of structures, dredging, and fill in tidal, coastal or navigable waters (CGS sections 22a-359 through 22a-363f, inclusive).

What's the difference between DEP and municipal regulatory areas?

The DEP has direct regulatory jurisdiction over activities occurring in tidal wetlands and/or waterward of the high tide line. The municipality regulates the upland waterward to the mean high water mark. In general, the mean high water mark is lower than the high tide line. Therefore, on gently sloping shorelines, there will be an area of overlapping jurisdictions (because the high tide line will be further landward than mean high water). Along steep shorefronts, for instance along a seawall, the high tide line and mean high water mark may be closely aligned, or may even coincide in the same vertical plane. The area of overlapping jurisdictions will be minimal in that case. Regardless of whether the DEP and/or the municipality have jurisdiction, the statutory policies and standards apply equally to both jurisdictions (see, also, the fact sheet for *State and Municipal Regulatory Jurisdictions*).

Office of Long Island Sound Programs
Fact Sheet
for
STORMWATER MANAGEMENT

What is Stormwater Management?

Stormwater management is a comprehensive process to minimize potential adverse impacts to natural resources and water quality from stormwater runoff. The traditional approach to handling stormwater runoff has been to collect it from the developed area and shunt it as quickly as possible to the nearest water body to prevent flooding in upland areas. In the past, little attention had been paid to the impacts of the associated increases in both the volumes and rates discharged and the pollutants carried in the runoff. The result has been severe erosion of streams, the loss and degradation of habitat, increased flooding and associated damage, increased siltation resulting in more frequent dredging to maintain navigation, and tremendous capital expenditures to address these problems.

Proper state-of-the-art stormwater management involves many techniques including pollution prevention, minimization of impervious surfaces, on-site retention of a portion of the runoff, where appropriate, and treatment of non-retained runoff to remove contaminants such as oils, greases, suspended solids and floatable debris. One general goal is to design development in such a manner that the changes in runoff rates and volumes are minimized. This is initially accomplished through the proper siting and design of proposed structures and infrastructure.

Why is stormwater management important?

Pollution of our surface and ground waters has been a recognized problem for many years. While great strides have been made in controlling point sources of pollution, primarily through the National Pollution Discharge Elimination System (NPDES) permitting program and corresponding state regulatory programs, there is a new awareness of the importance of controlling nonpoint sources of pollution (pollution generated by many diffuse sources). Stormwater runoff is a major contributor of nonpoint source pollution.

The amount of stormwater runoff from a given site is dictated by site-specific conditions, such as the soil's infiltration capacity, the type and extent of site cover (e.g., vegetation or pavement), the slope, and the duration and intensity of each rainfall event. Stormwater that penetrates the soil is slowed, filtered, cooled, and renovated. Renovation is a process by which bacteria and minerals in the soil treat and bind contaminants, removing them from the stormwater.

Impervious surfaces, such as pavement and buildings, reduce the area of soil into which rainfall can infiltrate, thus increasing the volume of runoff that flows over the land. As this runoff flows over impervious and pervious surfaces, it can pick up and transport floating, suspended, and

dissolved constituents such as pathogens, toxic materials (heavy metals, oils, antifreeze, pesticides, etc.), high levels of nutrients (fertilizers and organic matter), eroded sediments (topsoil and road sand), and trash. This runoff flows down gradient over the land to the nearest water body or depression where it not only deposits the contaminants it carries, but it alters the temperature, pH, and/or salinity of receiving waters. It should be noted that even clean, potable freshwater can be a pollutant when introduced to a brackish or saline environment in the coastal area. Freshwater dilutes the salt concentrations in the receiving area, adversely impacting the flora and fauna that are uniquely suited to such salty environs. Over the long-term, sediment settles out of the water column and can degrade habitat in stream bottoms, tidal wetlands, and shellfish beds.

Poorly planned new development and redevelopment can result in increased stormwater discharges, and ultimately more polluted runoff reaching watercourses and wetlands. Unlike conditions in the soil, there are few natural processes available in the receiving waters to treat, reduce, or control many of the harmful constituents in the runoff; they can only be diluted by the volume of water that they reach. With constant inputs after each rainfall, concentrations of many harmful constituents have been increasing in the sediments and the water column. Additionally, increasing stormwater discharges can lead to increased risks of flooding and flood damage and to increased siltation in coastal waters which often results in habitat degradation and an increased need to dredge to maintain navigation.

Design issues relate to the topography, soil conditions, existing drainage, and natural resources on and adjacent to the site. The implementation of structural and/or non-structural best management practices (BMPs) can also be used to provide both effective erosion and sedimentation control and minimization of other pollutants including oils, greases, toxics, pathogens and floatable debris. Please refer to the manual titled *Coastal Water Protection: A Guide for Local Officials*, (DEP, 1996) for additional detailed information. A copy of the guide has been provided to the planning and zoning department in each coastal municipality.

What are the statutory policies that apply?

The Connecticut Coastal Management Act (CCMA) contains several policies that highlight the need to incorporate stormwater management into individual project reviews and long-range planning. These include the following:

> To manage estuarine embayments so as to insure that coastal uses proceed in a manner that assures sustained biological productivity, the maintenance of healthy marine populations and the maintenance of essential patterns of circulation, drainage and basin configuration; to protect, enhance and allow natural restoration of eelgrass flats except in special limited cases, notably shellfish management, where the benefits accrued through alteration of the flat may outweigh the long-term benefits to marine biota, waterfowl, and commercial and recreational finfisheries [Connecticut General Statutes (CGS) section 22a-92(c)(2)(A)].
>
> It is found and declared that the pollution of the waters of the state is inimical to the public health, safety and welfare of the inhabitants of the state, is a public nuisance and is

> harmful to wildlife, fish and aquatic life and impairs domestic, agricultural, industrial, recreational and other legitimate beneficial uses of water and that the use of public funds and the granting of tax exemptions for the purpose of controlling and eliminating such pollution is a public use and purpose for which moneys may be expended and tax exemptions granted, and the necessity and public interest for the enactment of this chapter and the elimination of pollution is hereby declared as a matter of legislative determination [CGS section 22a-422, as referenced by CGS section 22a-92(a)(2)].

The CCMA defines adverse impacts which must be avoided or, if avoidance is not possible, must be minimized in order for a project to be lawfully approvable. The following potential adverse impacts must be considered during the coastal site plan review process and when evaluating proposed zoning regulation and map amendments.

> Degrading water quality through the significant introduction into either coastal waters or ground water supplies of suspended solids, nutrients, toxics, heavy metals, or pathogens, or through the significant alteration of temperature, pH, dissolved oxygen, or salinity [CGS section 22a-93(15)(A)];
>
> Degrading existing circulation patterns of coastal waters through the significant patterns of tidal exchange or flushing rates, freshwater input, or existing basin characteristics and channel contours [CGS section 22a-93(15)(B)];
>
> Degrading natural or existing drainage patterns through the significant alteration of groundwater flow and recharge and volume of runoff [CGS section 22a-93(15)(D)];
>
> Degrading or destroying essential wildlife, finfish or shellfish habitat through significant alteration of the composition, migration patterns, distribution, breeding or other population characteristics of the natural species or significant alteration of the natural components of the habitat [CGS section 22a-93(15)(G)]; and
>
> Degrading tidal wetlands, beaches and dunes, rocky shorefronts, and bluffs and escarpments through significant alteration of their natural characteristics and functions [CGS section 22a-93(15)(H)].

In addition, the state statutes pertaining to planning and zoning contain specific requirements for zoning regulations and plans of development that relate to the restoration and protection of coastal resources. These are:

> In any municipality that is contiguous to Long Island Sound the regulations adopted under this section shall be made with reasonable consideration for restoration and protection of the ecosystem and habitat of Long Island Sound and shall be designed to reduce hypoxia, pathogens, toxic contaminants and floatable debris in Long Island Sound. Such regulations shall provide that the commission consider the environmental impact on Long Island Sound of any proposal for development [CGS section 8-2(b)].
>
> The plan adopted under this section for any municipality that is contiguous to Long Island Sound shall be made with reasonable consideration for restoration and protection of the

ecosystem and habitat of Long Island Sound and shall be designed to reduce hypoxia, pathogens, toxic contaminants and floatable debris in Long Island Sound [excerpt from CGS section 8-23].

Proper management of stormwater will address these statutory requirements.

Are stormwater discharges regulated by the Department of Environmental Protection?

Yes. Technically, most discharges to the waters of the State Of Connecticut are regulated by the Department of Environmental Protection through either a general permit or individual permit requirement. There are several types of stormwater discharges that are covered by the issuance of a general permit. If the stormwater discharge does not qualify for coverage by the general permit because adverse impacts to the waters of the state would result, an individual permit may be required prior to discharge.

Registration is required to be submitted in order for stormwater discharges to be authorized by the following general permits issued by the Connecticut Department of Environmental Protection:

Stormwater and Dewatering Wastewaters from Construction Activities: This general permit applies to all discharges of stormwater and dewatering wastewaters from construction activities which include, but are not limited to, clearing, grading, and excavation and which result in the disturbance of *five or more acres* of total land area on a site.

Stormwater Associated with Commercial Activities: This general permit applies to all discharges from any conveyance which is used for collecting and conveying stormwater and which is directly related to retail, commercial, and/or office services whose facilities occupy *five acres or more* of contiguous impervious surface.

Stormwater Associated with Industrial Activities: This general permit applies to all discharges from any conveyance which is used for collecting and conveying stormwater and which is directly related to manufacturing, processing or material storage areas at an industrial activity site.

What can a municipality do to minimize impacts from stormwater runoff?

- Maintain, enhance or restore the quality of coastal waters and submerged lands through the adoption and implementation of a stormwater management ordinance, either as an amendment to the municipal zoning regulations or as a “stand-alone” ordinance. In either case, it should require 1) that new development projects be designed to minimize clearing, cutting and filling in undisturbed areas to ensure that new development is consistent with the capabilities of the land to support such development; 2) soil erosion and sediment control plans for all development projects near sensitive coastal resources, even those projects with less than one-half acre land disturbance proposed, and strictly enforce appropriate

sedimentation and erosion control measures during construction; and 3) that site plan and special permit/exception applications include appropriate best management practices to retain and treat on-site the runoff generated by the first inch of rainfall, remove 80% of the total suspended solids on an annual basis, and, where site conditions allow, prohibit post-development increases in the pre-development rates and volumes of stormwater discharge.

- Review zoning regulations to determine the maximum impervious cover allowed in each district and carefully consider reducing these maximums wherever possible, particularly in areas abutting coastal waters and other sensitive coastal resources, but also for areas serviced by municipal stormwater systems that discharge to coastal waters. Include buildings, paved areas, sidewalks, terraces, patios and other non-porous surfaces when calculating impervious cover.

- Update subdivision regulations to encourage cluster developments that incorporate features such as curbless roads, narrow roads, grass swales, retention ponds, and other features that reduce impervious cover, disperse and treat stormwater, and minimize the collection and transport of stormwater to surface waters.

- Update the municipality's Plan of Conservation and Development and Municipal Coastal Program, if applicable, to encourage best management practices for stormwater for all new or substantially improved development, including improvements to municipal roads, bridges and other facilities, and for currently developed areas. Consider including the following:

  An inventory of existing storm drain outfalls to identify opportunities to retrofit roads and other municipal facilities for stormwater retention and pollutant reduction;

  Identification of illicit connections to municipal storm sewer system (anything that is not stormwater that is being discharged to the stormwater system without a permit) and recommendations to correct or mitigate adverse impacts associated with these connections;

  Adoption of a municipal ordinance that prohibits illicit connections to municipal stormwater systems;

  Consideration of (and preparation for) the use of alternatives to winter sanding and salting on roadways and parking areas;

  Planning for and implementation of appropriate snow disposal practices;

  Initiation of a storm drain stenciling program to help identify direct links to coastal waters and other waterbodies;

  Adoption of an ordinance that limits the application of fertilizers and broad-based pesticides, particularly in months with historically high or low average precipitation such as April and August; and

Recommendations for regularly scheduled street sweeping and catch basin clean-outs to minimize the amount of sediment, contaminants, and floatable debris entering coastal waters and other waterbodies through the municipal stormwater management system, and recommendations to amend the zoning regulations to require similar maintenance of private parking lots and streets.

- Develop a watershed management plan with neighboring municipalities that share your watershed boundaries, and implement a coordinated stormwater management plan.

- Develop an educational handout that: addresses the importance of stormwater management; identifies actions that individuals can take to minimize potential stormwater impacts (including, for example, the proper use of fertilizer, disposal of used motor oil and composting of lawn clippings, etc.); and includes the municipality's standards for development. Include it in every application package for land use and/or building permits and authorization.

- Develop an open space/greenways plan to create recreational opportunities and buffer sensitive and important resources, particularly streams, tributaries, and coastal resources from stormwater impacts.

- During the review process for new or redeveloping marinas, require coastal site plan conditions that incorporate the practices identified in *Best Management Practices for Coastal Marinas* (DEP-OLISP, August 1992).

- Coordinate with the Department of Environmental Protection's Stormwater Management Unit to make sure that all eligible stormwater discharges from industrial, commercial, or construction activities are covered by the appropriate general permit and to ensure compliance with Stormwater Pollution Prevention Plans.

- Refer coastal site plan review applications for waterfront sites or significant development proposals within the coastal boundary to the DEP's Office of Long Island Sound Programs for comment and technical assistance.

Office of Long Island Sound Programs
Fact Sheet
for
VEGETATED BUFFERS

What is a Vegetated Buffer?

A vegetated buffer is a small area or strip of land in permanent undisturbed vegetation adjacent to a waterbody or other resource (e.g., wetland). It can be either in a natural state or artificially planted. Depending upon their purpose and site-specific conditions, vegetated buffers can range in size from several feet to hundreds of yards wide.

Why are they valuable?

Buffers protect resources from adjacent development by reducing the adverse effects of human activities on natural resources including wetlands and surface waters. They protect water quality and temperature, control erosion and trap sediment, protect and provide wildlife habitat, reduce the effects of flooding, reduce the potential for direct human disturbance of sensitive resources, and maintain aesthetic diversity and recreational value. A buffer provides a mosaic of interdependent functions. Installation of a buffer area can also lessen lawn maintenance requirements by reducing the area of manicured landscape.

How do they work?

Buffer areas work through several means. Land within buffer areas is not developed and, therefore, generally does not generate pollution. Vegetated buffer strips act as filters to intercept and absorb nutrients, sediment and other pollutants carried in stormwater run-off. Buffers slow down runoff which both reduces erosion and allows silt and other suspended solids to settle out before they reach a receiving waterbody or wetlands. Additionally, any contaminants attached to the sediment do not reach the waterbody or wetlands. Vegetated buffers provide an area for infiltration, thereby reducing the volume of runoff. Bacteria, pathogens and pesticides that are trapped within the buffer area decompose or are broken down, thus, preserving water quality.

Creating vegetated buffers

Where do we use vegetated buffers?

Vegetated buffers should be located between upland development and adjacent waterbodies or resources. Some water-dependent uses or water-dependent components of projects will likely require development within a buffer area, but water-dependent uses and vegetated buffers are not necessarily mutually exclusive.

How big is big enough?

The size of an effective buffer can be anywhere from a small unmown area of a lot to a large forested strip. The ideal buffer width will depend on the desired emphasis (water quality protection, wildlife habitat, temperature moderation, erosion control, etc.), the amount of available land, and the proposed use of the property. Generally, the effectiveness of a buffer increases with its size. Large buffers (e.g., 100 feet or greater in width) provide the best protection for water quality by buffering temperature changes and improving control of erosion, sedimentation and pollution. However, even a narrow buffer (15 to 30 feet in width) can be effective under certain conditions.

What determines the effectiveness of a buffer area as a stormwater management measure?

- The type of stormwater flow. Sheet flow (unrestricted flow across the ground) along the length of the buffer allows the buffer area to more effectively trap sediments, attenuate pathogens and pollutants, and encourage infiltration. Concentrated flow (e.g., flows directed through swales, pipes or other conveyances) reduce or essentially eliminate the effectiveness of the buffer for stormwater management.
- The general topography of the buffer area. Flat or gently sloping buffers are more effective because they slow the rate that stormwater flows across them which enhances their infiltration and filtering capability.
- The permeability of the soils and the depth to the water table. Generally, higher permeability and greater depth to the water table will increase the rate of infiltration and attenuation within the buffer area.
- Whether the current vegetation is native or non-native, its density and its character (e.g., forested, shrubby, grassland, etc.). Dense native vegetation is generally more effective and requires less maintenance as it is inherently suited to the local climate.
- Whether the land use above the buffer poses a high, medium or low risk for pollution. The higher the risk posed by the upland use, the greater the need for an effective buffer. Increasing the width of a required buffer and/or increasing the density of native plantings can aid in offsetting the potential impacts from a high-risk upland use.
- Whether there is an existing buffer, and if so, whether its width is sufficient to provide habitat and corridors for wildlife, erosion and sedimentation control, water quality protection or other benefits of vegetated buffers. If an existing buffer of adequate width is present on a lot, all efforts should be made to preserve it in its natural state.
- What types of activities are permitted within the buffer. The fewer activities that include land clearing, grading or other disturbances, the better. However, in many instances, passive recreational amenities, such as hiking trails, may be appropriate.

In general terms, what does the ultimate vegetated buffer look like?

The answer will depend on what you want the buffer to do (and it can't do it all). However, in general terms, the ultimate vegetated buffer has gentle slopes, with undisturbed, moderately permeable soils and dense native vegetation, and is as wide as possible given the lot size, site conditions and proposed use(s).

How can a municipality implement vegetated buffers?

- Update zoning regulations to better protect sensitive resources by establishing or increasing protective buffers between development and coastal waters and associated sensitive resources. These buffers should be required landward of the upland limit of tidal wetlands, beaches and dunes, and coastal and inland waters and from the tops of bluffs and escarpments.

- Once buffers are established by regulation, they should be strictly honored. Variances of the minimum buffer width should only be allowed in those extremely limited cases where there is a statutory hardship as defined in the Connecticut General Statutes Section 8-6(3) or to provide water-dependent use opportunities where appropriate.

- Revise subdivision regulations to require vegetated buffers abutting all water resources in new subdivisions.

- Revise zoning and subdivision regulations to limit clearing of vegetation to enhance views and to prohibit clearing or cutting on or above bluffs and escarpments.

- Update inland wetlands regulations to require larger buffers for all regulated activities adjacent to wetlands, including vernal pools and watercourses.

Office of Long Island Sound Programs
Fact Sheet
for
WATER-DEPENDENT USES

What are Water-Dependent Uses?

Water-Dependent Uses are specifically defined in the Connecticut Coastal Management Act (CCMA). In general, they are land uses that require direct access to coastal waters in order to function and which therefore must be located at the waterfront rather than on inland sites. Such uses include, but are not limited to marinas, commercial fishing or boating facilities and uses that provide general public access to coastal waters [Connecticut General Statutes (CGS) section 22a-93(16)].

Why is it important to make special provisions for them?

Locating water-dependent uses at waterfront sites is important because:

- waterfront properties are an extremely limited resource with the unique capacity to accommodate water-dependent uses, which, by statutory definition require waterfront sites. However, waterfront properties are also in great demand for many non-water-dependent uses which can be located inland;
- they are a significant part of our cultural heritage;
- they are an important sector of our state's economy; and
- they often depend upon or are enhanced by high quality waters thereby creating a constituency for water quality and coastal resource protection.

What are the statutory policies that apply?

To manage uses in the coastal boundary through existing municipal planning, zoning and other local regulatory authorities, giving highest priority and preference to water-dependent uses and facilities in shorefront areas [CGS section 22a-92(b)(1)(A)].

Municipal boards and commissions reviewing coastal site plans shall determine if the potential adverse impacts to future water-dependent development activities are acceptable and that such impacts have been mitigated using all reasonable mitigation methods [CGS sections 22a-106(a) and (e)].

Evaluating adverse impacts to future water-dependent development opportunities:

When a non-water-dependent use is proposed on a waterfront site, the reviewing board or commission must determine the acceptability of potential adverse impacts to possible future water-dependent development activities associated with the proposed development. While doing this evaluation, the following factors, which define adverse impacts to future water-dependent development activities, must be considered [see CGS section 22a-93(17)]:

(1) Is site physically suited for a water-dependent use for which there is reasonable demand, or has the site been identified in the plan of development or zoning regulations for water-dependent uses?
(2) Will a non-water-dependent use replace an existing water-dependent use as part of the proposed development or redevelopment?
(3) Will a non-water-dependent use inhibit or restrict existing public access*?

If any of the above three conditions apply, the proposed non-water-dependent use may preclude existing or future water-dependent uses and create unacceptable adverse impacts. Upon such a determination, the proposed use should be modified or conditioned if such impacts can be mitigated to a level which is consistent with applicable goals and policies of the Act or, if modification cannot achieve consistency, the project should be denied. Adverse impacts may be mitigated by providing coastal public access (see fact sheet for *General Public Access to Coastal Waters* for additional details).

What can a municipality do to promote water-dependent uses and minimize potential adverse impacts to such uses?

- Amend the Plan of Conservation and Development to: (1) identify areas where active (e.g., port facilities) and passive (e.g., coastal public access) water-dependent uses are appropriate or most needed and (2) require adequate and appropriate relocation of existing water-dependent uses if proposed redevelopment of waterfront sites cannot be configured to retain such uses. Please note that in a situation such as this, the redevelopment plan must provide a comparable level of water-dependent use in order to minimize adverse impacts to future water-dependent development opportunities as required by the CCMA (see above).

- Amend the zoning regulations to provide specific municipal authority to require water-dependent uses including coastal public access through the coastal site plan review process, as already provided in the Coastal Management Act.

- Amend the zoning regulations to establish separate zoning districts for shorefront areas currently used for water-dependent uses, as allowed in CGS section 8-3(k), to

* Existing public access can be either formal access secured by public land ownership or an access easement or informal access resulting from long-term open customary use of the property to access coastal waters.

promote the continuance of such uses without being subject to challenges of "spot zoning."

- Amend zoning regulations in appropriate waterfront zoning districts to ensure that "active" water-dependent uses (e.g., marinas) are allowed as-of-right. If non-water-dependent uses are allowed in such zoning districts, they should only be permitted: (1) on sites where on-site coastal resource constraints preclude the establishment of active water-dependent uses and, in these cases, proposed development should include meaningful general public access as the water-dependent project component; or (2) the non-water-dependent use is clearly ancillary to or supports a water-dependent use and does not diminish it in any way. Alternatively, the municipal zoning regulations could be amended to allow only active water-dependent uses.

- Direct waterfront project applicants and town staff to meet prior to formal submission of coastal site plan review applications in order to review the CCMA's water-dependent use requirements. The purpose of such meeting(s) should be to: 1) evaluate the site's suitability to support water-dependent uses; 2) assess the level of water-dependency proposed in the development/redevelopment plans; and, 3) explore how any proposed non-water-dependent use of a waterfront site could be modified to incorporate appropriate water-dependent use components. Where other water-dependent uses are not feasible due to site constraints, often a water-dependent use can be incorporated into the site design through the provision of a general public coastal access facility which could render the proposal consistent with the CCMA policies and standards (see fact sheet for *General Public Access to Coastal Waters*).

- Require applicants to post performance bonds or escrow accounts to ensure that water-dependent use project components are constructed, as authorized by CGS section 22a-107.