

Great Bay

A wide-angle photograph of a coastal landscape. In the foreground, there is a rocky shoreline with patches of dry, brown grass and some small evergreen trees. The middle ground shows a calm body of water reflecting the clear blue sky. In the background, a line of trees with some autumn-colored foliage borders the water. The overall scene is peaceful and scenic.


Nitrogen & NPDES Permits

Stephen Perkins

March 9, 2011



NH is a non-delegated state
- EPA issues & defends permits
Permits issued on a 5 year cycle



**Discharges must
be evaluated
relative to state
water quality
standards**

Clean Water Act



Great Bay has a chronic nitrogen problem

**Dissolved inorganic \uparrow 44% in the
last 28 years**



Eelgrass biomass declined

64%

1990 →

2008

Establishing Discharge Limits

no numeric
nitrogen criteria?



“EPA's legal obligation to ensure that NPDES permits meet all applicable water quality standards, including narrative criteria, cannot be set aside while a state develops (numeric) water quality standards.”



Applicable Narrative Criteria



waters shall be restored to meet
the water quality criteria

waters shall contain no phosphorus or
nitrogen in such concentrations that would
impair any existing or designated uses
unless naturally occurring

Establishing Discharge Limits

Best available science
NHDES's proposed
nitrogen criteria is
site specific





MassDEP thresholds – concentrations of total nitrogen that are best for eelgrass are <0.3 mg/l.

Studies establish that a sharp decline in the depth at which seagrass can survive begins at approximately 0.2 mg/l total nitrogen.

The median value for total nitrogen in Great Bay is 0.42 mg/l and significantly higher in the tributaries.



Point Source
&
Nonpoint Source

**How about the
small MS4
stormwater
permit for
New
Hampshire?**



Implementation

A close-up photograph of a clock face, showing Roman numerals and a brass rim. A dark green vertical bar is positioned on the left side of the image, partially obscuring the clock face. The clock hands are visible, with the hour hand pointing towards the 10 and the minute hand pointing towards the 2.

**Permits reissued over the next
three years**

Comment period

Response to comments

Environmental Appeals Board

Striving for Affordability

An annual household
sewer rate of
of median household
income

< 2%



capital costs

A stack of several coins, likely US quarters, is shown in the upper right corner of the image. The coins are stacked vertically, with the top coin clearly visible. The background is a solid blue color. The text 'capital costs' is written vertically on the left side of the image in a large, white, sans-serif font.

Costs are site specific and can vary significantly from facility to facility

Planning and design work is necessary in order to accurately determine costs



wait for better science?

Environmental Appeals Board

...the regulation requires water quality-based effluent limits even when there is some degree of uncertainty regarding both the precise pollutant discharge levels and the potential causal effects of those discharges...



notable successes

Tampa Bay

Water clarity doubled

Seagrass restored

Mean algal biomass levels cut in half

Denmark Estuaries

Anoxic conditions - GONE

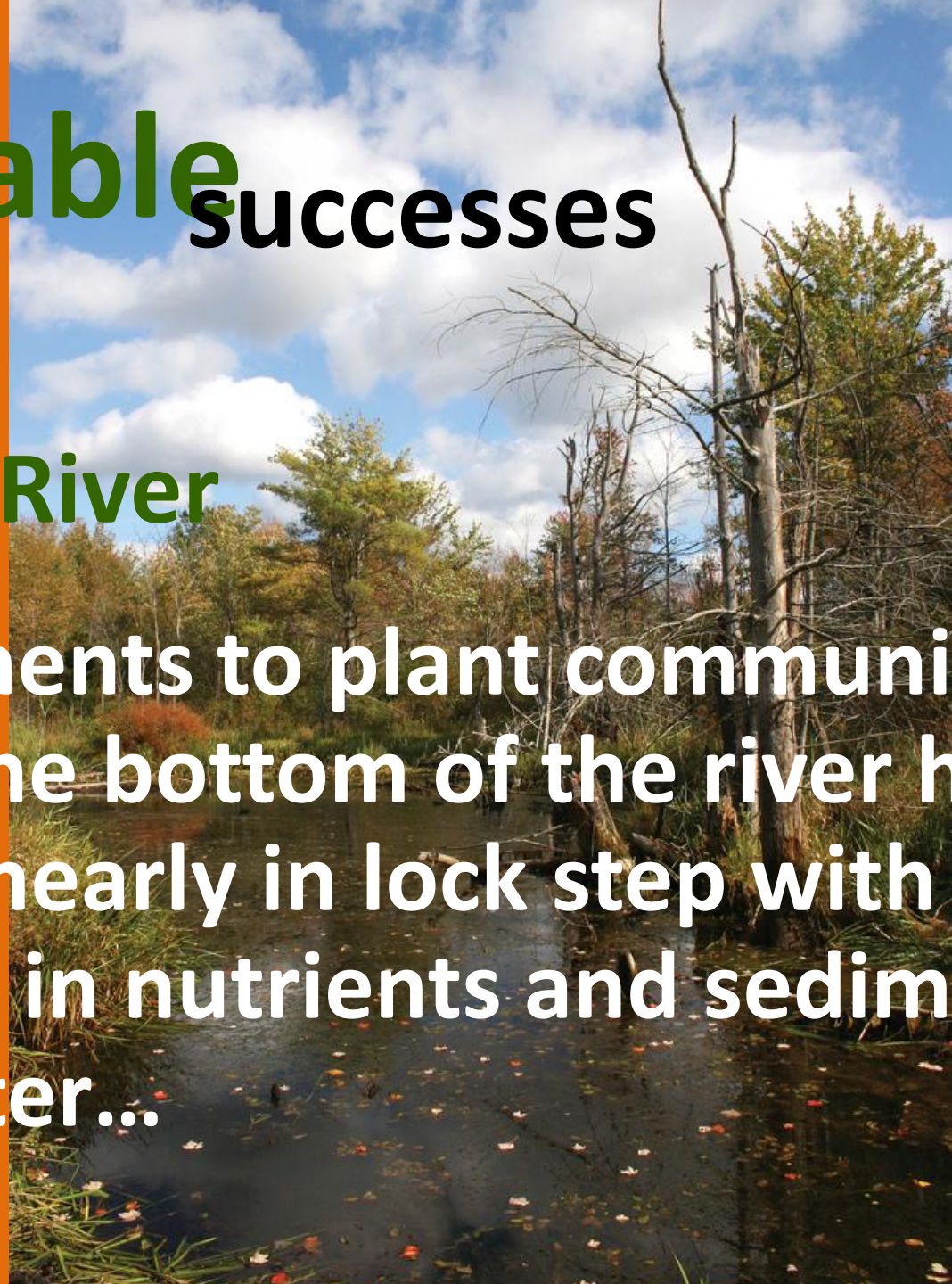
Recovery of seagrass

Restoration of fish species

notable successes

Potomac River

Improvements to plant communities living at the bottom of the river have occurred nearly in lock step with decreases in nutrients and sediment in the water...



An underwater photograph showing a dense field of healthy eelgrass. The blades are long, thin, and green, with some showing fine, hair-like structures. The water is clear and greenish. A black rectangular box is overlaid on the right side of the image, containing the text "Healthy Eelgrass" in white.

Healthy Eelgrass

Title Slide - Credit: USFWS www.flickr.com/photos/usfwsnortheast/5198415699/

EPA Building – EPA HQ

Lab Beaker – EPA New England

Bird House – Credit: USFWS www.flickr.com/photos/usfwsnortheast/4149555581/

Discharge Limits – Credit: MassDEP

NH Statehouse – Credit: Sean Marshall

Image Credits

www.flickr.com/photos/7119320@N05/4789008386/#

Durham @ Dawn – Credit: Not on Your Nelly

www.flickr.com/photos/notonyournelly/5275935424/#

Sampling Boat – EPA New England

Eelgrass bed – Credit: lauryshark www.flickr.com/photos/lauryshark/3692651910/

Eelgrass Three Stalks – Credit: Tetzl www.flickr.com/photos/tetzl/389138730/

Point Source & Nonpoint – Credit: MassDEP & EPA HQ

Maple Leaf in the Rain - Credit: Raul Lieberwirth

www.flickr.com/photos/lanier67/184302007

Watch – Credit: dibytes Diane Hammond www.flickr.com/photos/dibytes/4647624108/

Piggy Bank – Credit: MS Clip Art

Coins – Credit: MS Clip Art

Shoreline of Bay – Credit: USFWS www.flickr.com/photos/usfwsnortheast/4149550669/#

Rocky Shore - Credit: USFWS www.flickr.com/photos/usfwsnortheast/4150324902/#

Salt March Creek – Credit: USFWS www.flickr.com/photos/usfwsnortheast/4149560037/

Dead Tree – Credit: USFWS www.flickr.com/photos/usfwsnortheast/5101842809/#

Winter Tree on Hill – Credit: CeeDave www.flickr.com/photos/ceedave/3141433330/

Thank You Lobster – Credit: jlbruno www.flickr.com/photos/jlbruno/1375530465/

Thank You



perkins.stephen@epa.gov

