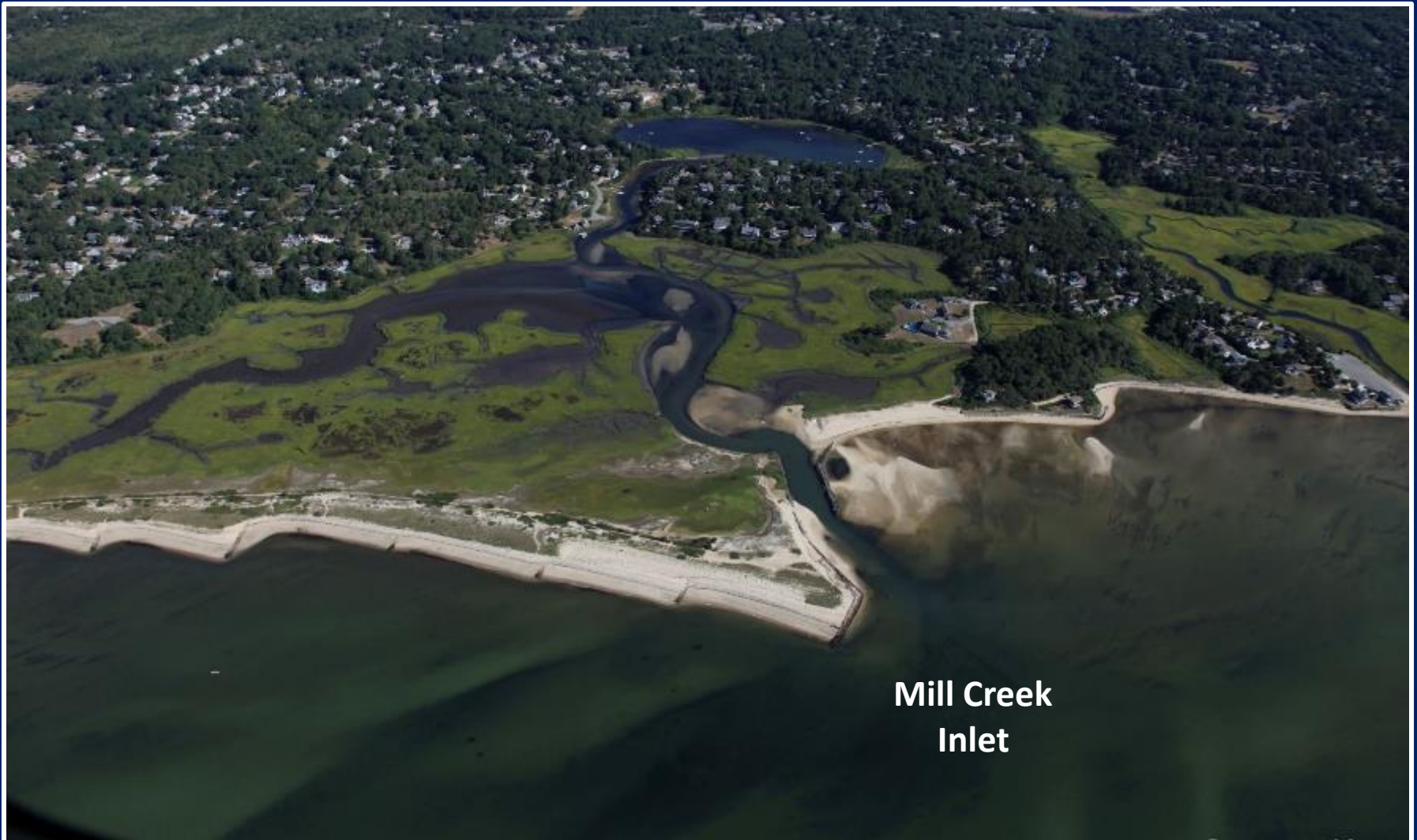
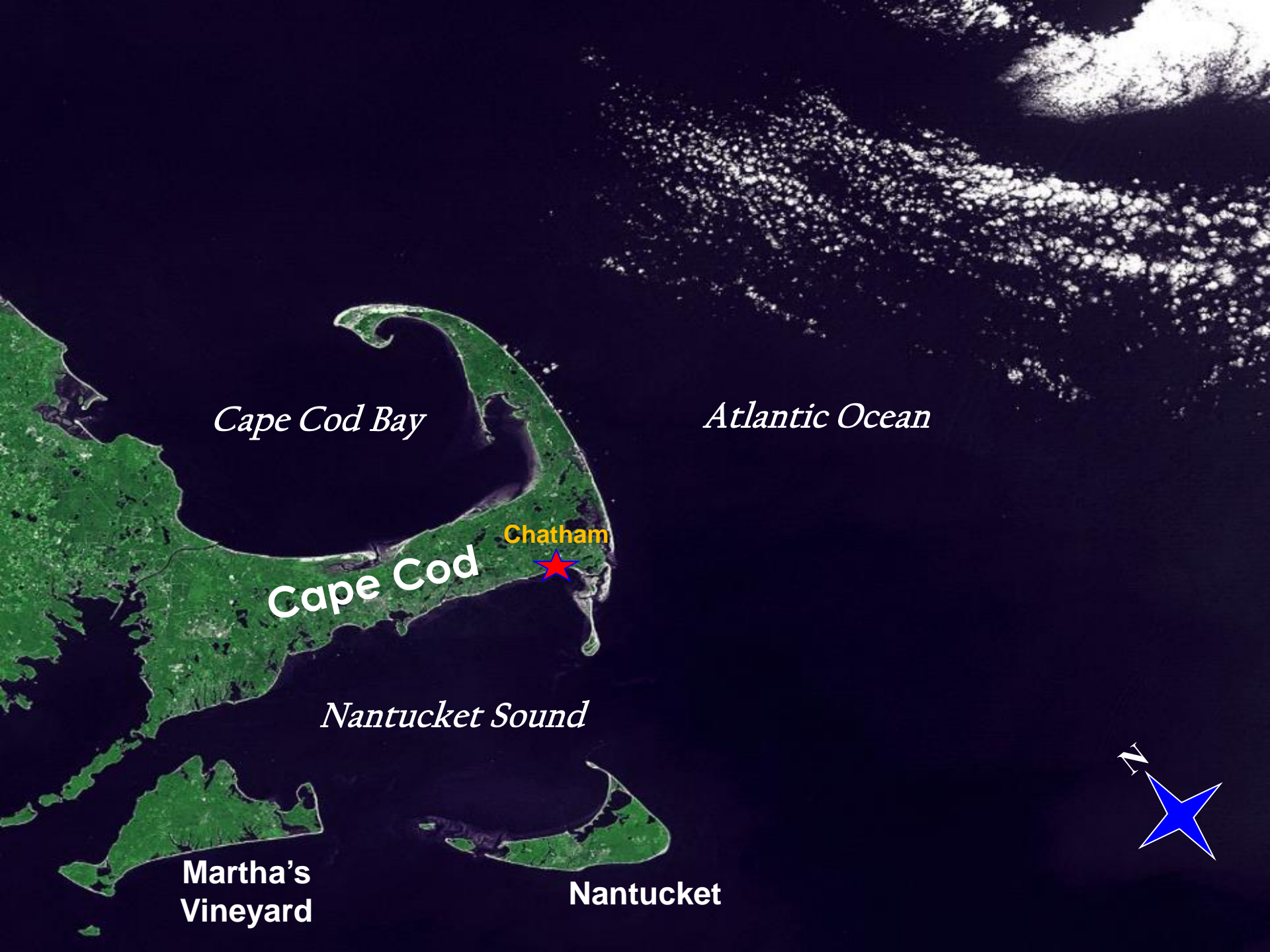


# Dredging, Sand Management and Habitat Restoration of a Jettied Inlet System, Chatham, MA

Ted Keon, Town of Chatham





*Cape Cod Bay*

*Atlantic Ocean*

**Chatham**

**Cape Cod**

*Nantucket Sound*

**Martha's  
Vineyard**

**Nantucket**





## Large Marsh Ecosystem with Tidal Kettle Pond

- Commercially & recreationally harvested shellfish
- Minor navigation/boat mooring
- Shellfish propagation- Quahog grow-out beds
  - 600 K to 1 M per yr.



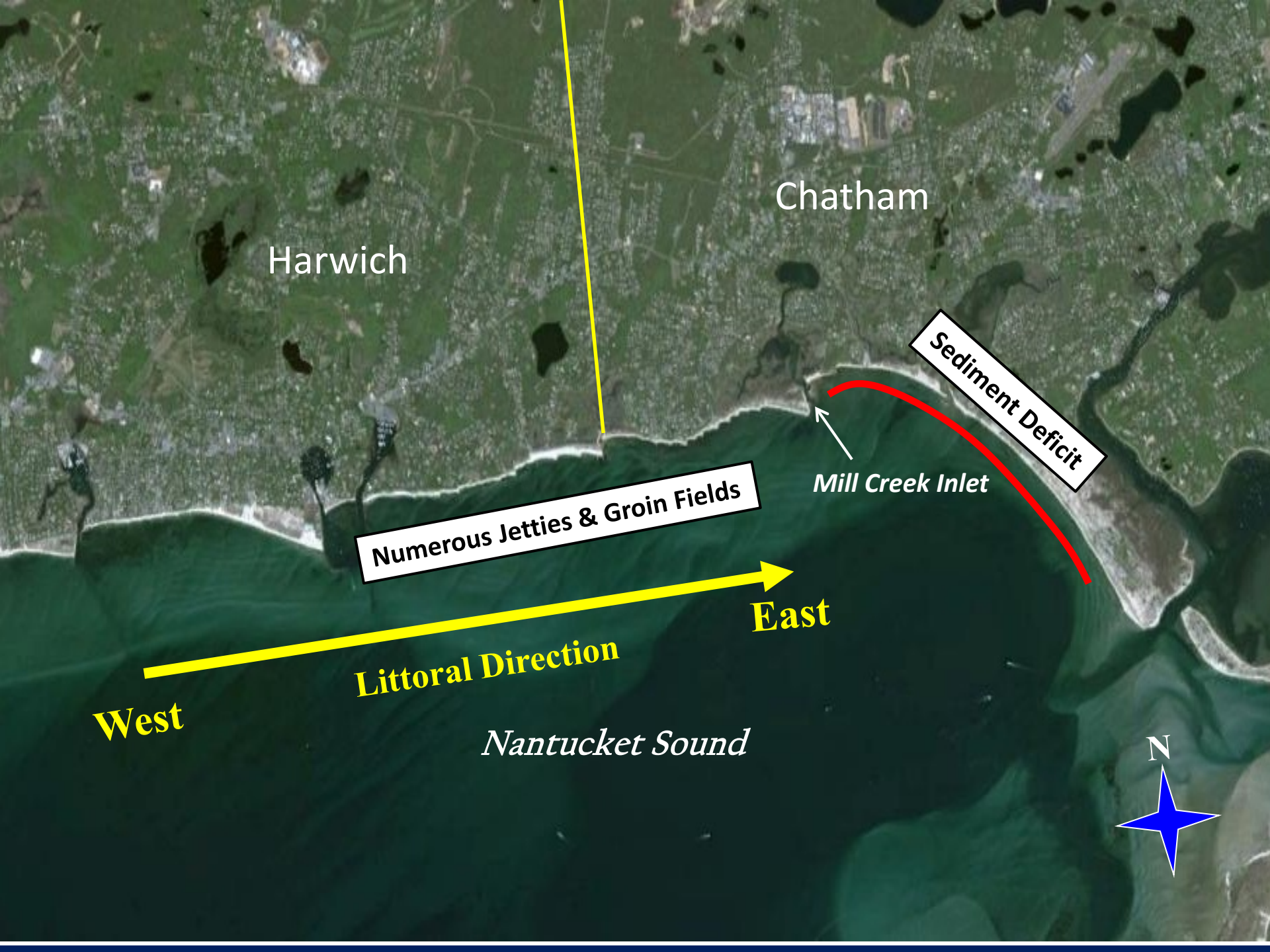
*Taylor's Pond*

Shellfish  
Propagation

*Forest Beach*

*Mill Creek  
Inlet*





Harwich

Chatham

Numerous Jetties & Groin Fields

Sediment Deficit

Mill Creek Inlet

West

Littoral Direction

East

*Nantucket Sound*





*Taylor's Pond*



*Mill Creek  
Inlet*

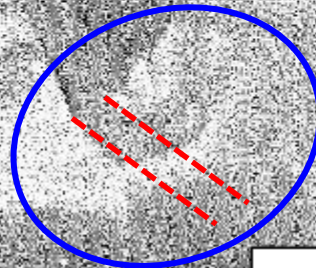
**1938**



## *Taylor's Pond*

### **Reduction in Sediment Flow**

- Early to mid-1960's: Groin field construction
- Re-designed western (updrift) stone jetty
- Old timber jetty cutoff at mudline



**Mill Creek  
Inlet**



**1966**

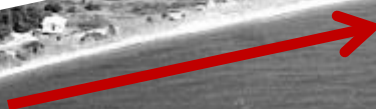


**Taylor's Pond**



**Sediment Deficit- Heightened Erosion**

**Mill Creek Inlet**



**Little to No Natural Sand**  
**By-passing**

**1979**



### West Jetty Fillet

- Filled to capacity
- Sand naturally by-passing into channel



**Jun 2006**



## Issues

- Poor flushing/water quality
- East jetty “flanking”
- Navigation impacts
- Shellfish habitat impacts
  - Abandonment of propagation beds

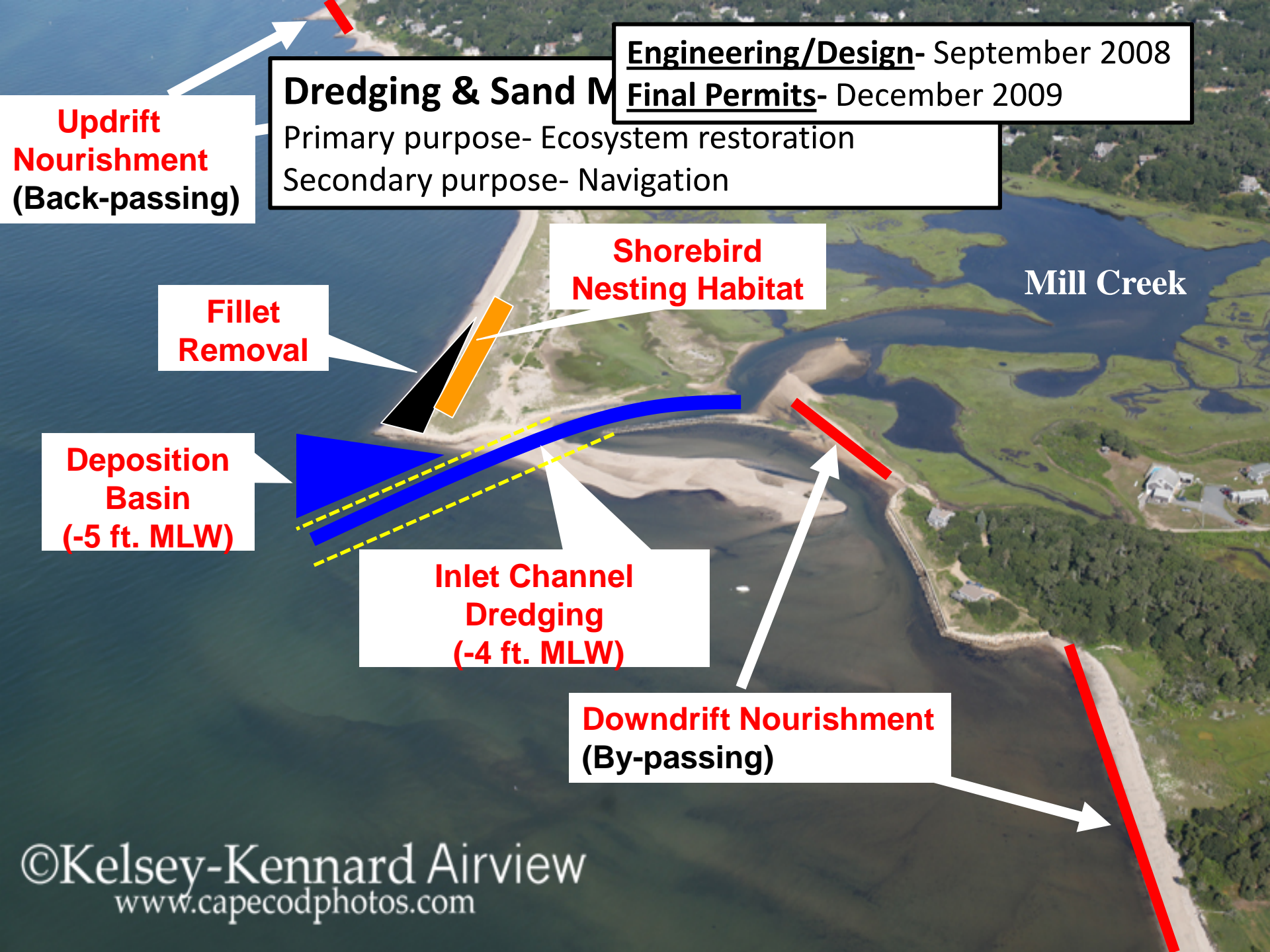
*Taylor's Pond*



©Kelsey-Kennard Airview  
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**Oct 2009**





Engineering/Design- September 2008

Final Permits- December 2009

## Dredging & Sand M...

Primary purpose- Ecosystem restoration

Secondary purpose- Navigation

**Shorebird  
Nesting Habitat**

Mill Creek

**Fillet  
Removal**

**Deposition  
Basin  
(-5 ft. MLW)**

**Inlet Channel  
Dredging  
(-4 ft. MLW)**

**Downdrift Nourishment  
(By-passing)**



## Initial Project Completion: April 2010

- Total volume removed: 14,000 cys
  - Channel and deposition basin only
  - Deferred fillet removal/habitat enhancement
- Flushing restored
- Shellfish propagation reestablished

**Spring 2010**



**Downdrift Nourishment**



**March 2010**





**7 Months Later**

**Inlet Dredging Since April 2010**

<u>Date</u>	<u>QTY</u>	<u>Disposal</u>
Apr 2010	14,000 cys	By-Pass
Nov 2010	4,500 cys	By-Pass
Nov 2011	3,000 cys	Back-Pass
Apr 2012	2,000 cys	By-Pass
Oct 2012	4,000 cys	Back-Pass
Nov 2013	3,500 cys	By-Pass
Feb 2015	7,500 cys	By-Pass
<b>Total</b>	<b>38,500 cys</b>	

**Oct 17, 2010**



# Public/Private Partnership



*Mill Creek*

Fillet Removal

## Town Support:

- Reduce inlet shoaling
- Sand back-passing
- Privately funded \$\$

Beach Disposal

Chatham

Harwich

*Red River*



### **Shorebird Habitat: Post-project**

*In cooperation with Massachusetts Audubon- Coastal Waterbird Program*

- Removal of low dunes and vegetation
- Wide berm width
- Berm height above Spring Tide levels
- Gentle slopes
- Occasional grassy sand mounds (refuge)



**Jan 2015**

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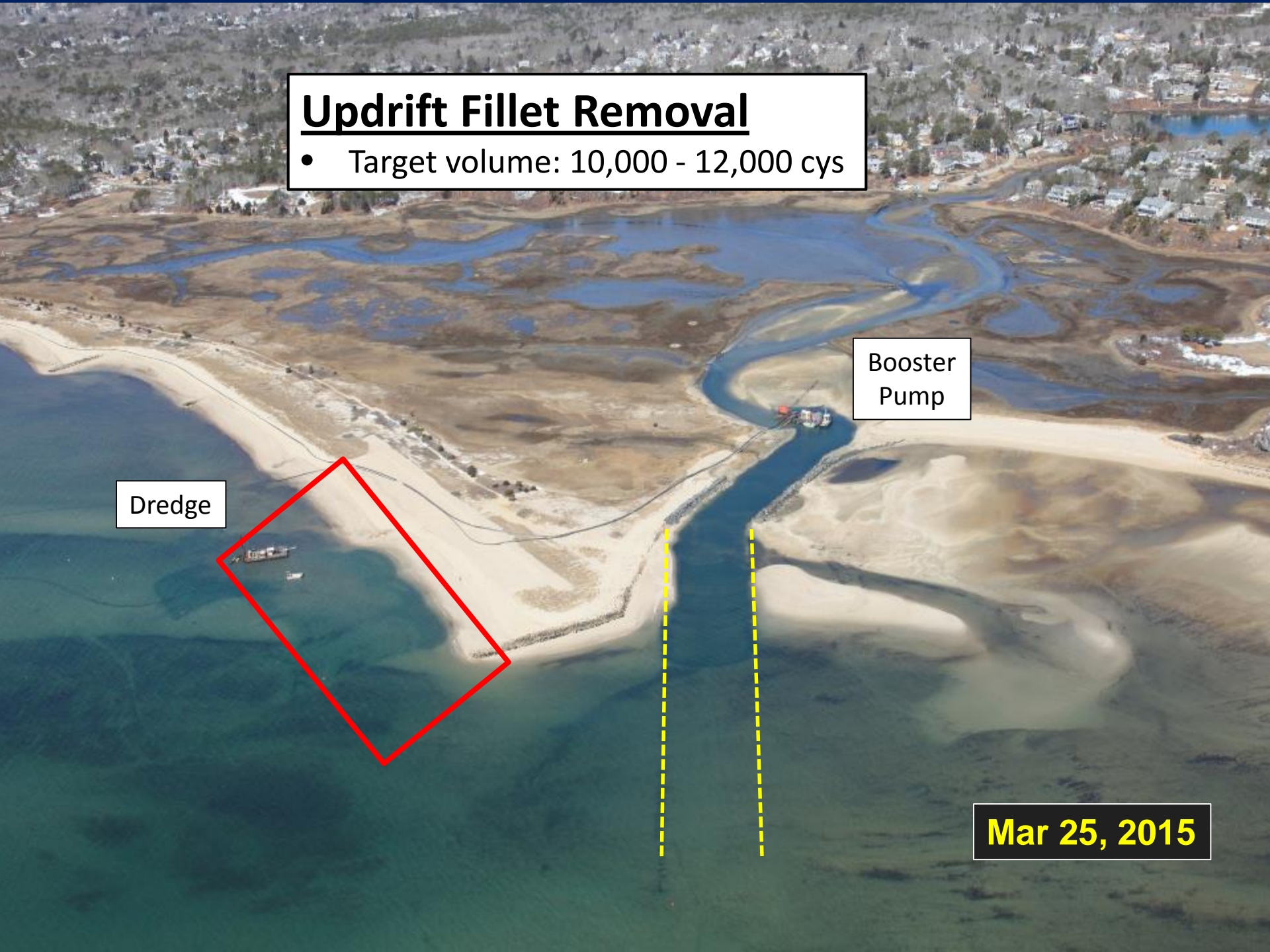
# Updrift Fillet Removal

- Target volume: 10,000 - 12,000 cys

Dredge

Booster  
Pump

**Mar 25, 2015**







**Apr 2015**

*Mill Creek*  
Dredge

**Approx. 6,000 ft.**

**Public beach  
930 cys**

**Private beaches  
9,800 cys**

*Red River*

**Mar 2015**

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## Habitat Enhancement Area: Nesting and Fledging

- Post-project (2015 & 2016)
  - **12** Piping Plover chicks fledged
  - **4** Least Tern nests (6+ eggs), No fledged chicks
- Pre-project (2013 & 2014)
  - **3** Piping Plover chicks fledged
  - **0** Least Tern activity

## Effects After Project

by-passing reduced  
ed shoaling  
low maintained  
ation possible

**Aug 5, 2016**

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## **Private Funding**

1. Engineering support
2. Dredge cost (9,800 cys)
3. Beachfill spreading
4. Habitat enhancement
5. Habitat monitoring (4 yrs.)

**Total: est. \$175,000**



**Aug 2015**

**Sold- \$3.75 M  
(Sept 2016)**

**Listed- \$1.999 M  
(Under Contract)**

**Jun 2015**



# Thank You

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Photo courtesy Paul Lagg