



What Caused the STINK in Three Fathom Harbour in Summer 2015?

**Bob Pett, Ph.D., Environmental Analyst
September 30, 2015**

Wetland Restoration Project to Offset Wetland Loss at the New Lakeview Elementary School

Porters Lake

Route 207

Atlantic View Trail

~2 ha
wetland

Rocky Run

Three Fathom Harbour Road

Spruce Court

S. W. CORNER 02324 138

L-16-1

02-08-10

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Project Restores Tidal Flushing to the Causeway 'Pond'




**Buried Culvert
(0.82 m D)**

September 2010



**Box Culvert
(3.3 m x 3 m)**

September 2015



**Determining the cause of the
STINK and future likelihood
requires an evaluation of past
conditions at the site.**



→ Dynamic System!

**Consider changes at
the beach over 5 years.**

**Very little seaweed
wrack on the beach
in September 2010**

September 2010



September 2010



May 2011

**+8
months**

**Considerable deposit
of seaweed wrack
after the winter**

**Recent rain storm
blew-out the culvert
and drained the pond**

**Rare
Event**

August 2011

**+3
months**

**New channel, less wrack, vegetation
growth, sand deposition & wrack burial**



August 2011

**Buried
Culvert**



March 2012

**+7
months**

New channel and more wrack



July 2012

**+4
months**

No channel and little wrack





Appears to be a pattern of wrack deposition in fall and winter and clearing out (& burial) through the summer months.

In past years, the beach has been raked for seaweed.

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**2 years later -
little wrack and
no channel**

August 2014



**Little wrack
and no channel**

April 2015

**+8 months
later**

**Long, hard
winter!**

**Very large
accumulation
this year!**




April 2015



May 2015

**~1 month before
construction**





When excavation started in early June, there were thick deposits of seaweed wrack. These deposits were still present at the end of construction in early July.

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Digging into the thick layer of wrack, followed by new channel formation by ebbing waters during a warm and humid period, exposed rotten seaweed (wrack) to oxygen and released noxious gases (e.g., hydrogen sulfide).

Decomposition accelerated along with a STINK!

July 16, 2015

**~1 week after
construction**

**At least one
happy family!**

**New channel cut
through the wrack**

**Anoxic pools of
water on top of
rotting seaweed**



July 28, 2015

**New
channel**

**~3 weeks
after
construction**

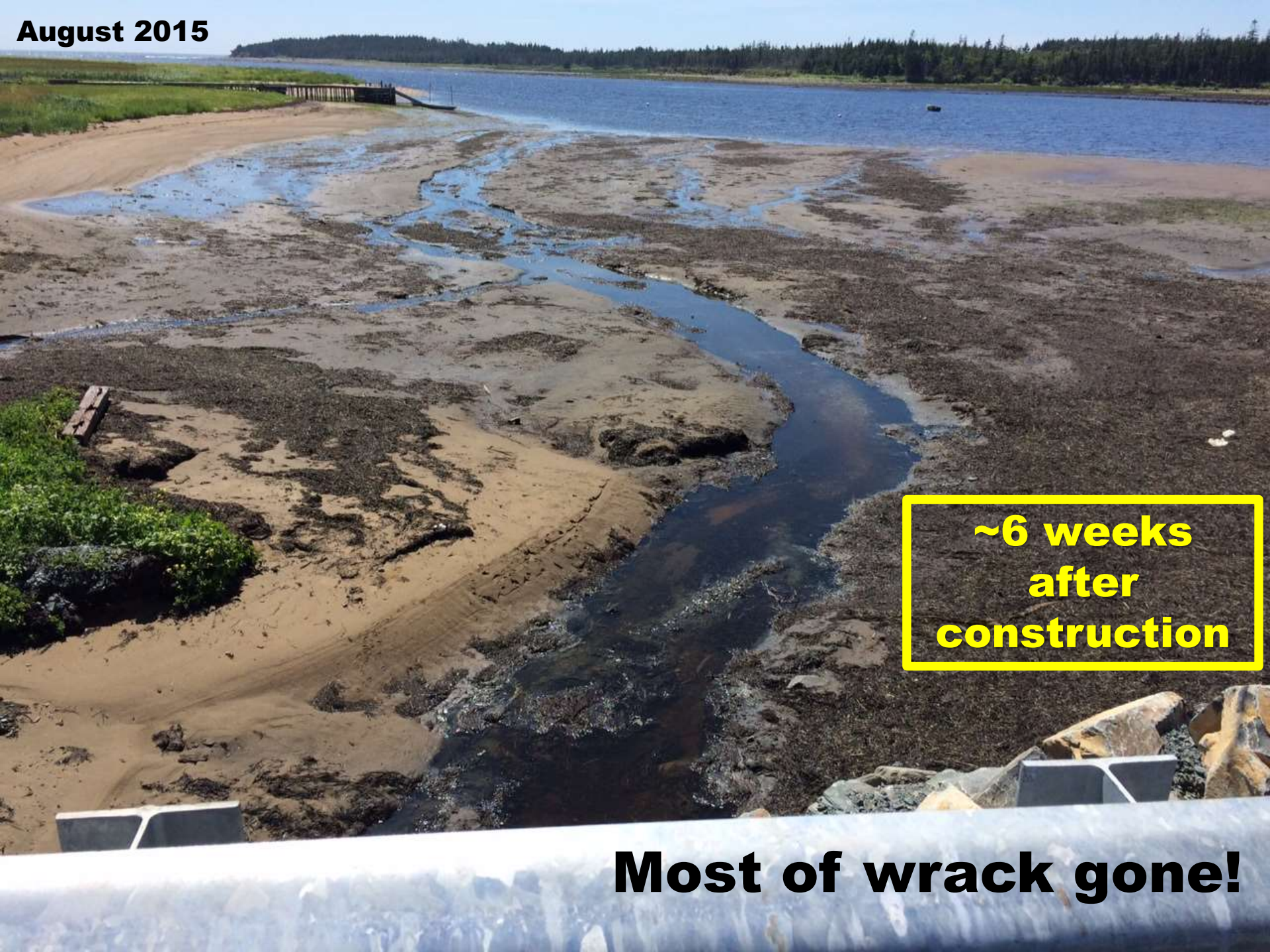


July 28, 2015



Odour levels typical of coastal areas

August 2015



**~6 weeks
after
construction**

Most of wrack gone!

September 2015



**~3 months after
construction**

September 2015



September 2015



The STINK was a temporary event and odours dissipated to background levels within 2-3 weeks of work completion.

As in previous 5 years, much of the accumulated wrack had cleared-off the beach in August. New tidal flows in and out of the 'pond' are anticipated to reduce future wrack deposition near the culvert.

September 2015



Larger crossings = healthier systems

September 2015



Watch the wetland evolve!



Post-construction monitoring will start next summer and continue for at least 5 years. Reports will be posted on the NSTIR website:

**[http://novascotia.ca/tran/works/enviroservices/
enviroSaltMarsh.asp](http://novascotia.ca/tran/works/enviroservices/enviroSaltMarsh.asp)**

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**And
finally,,,**

**No Oxygen does indeed create
a STINK, but the new culvert
delivers oxygenated waters and
promotes higher biodiversity in
the salt marsh and the beach.**