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

Rocky Run

Route 207

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

~2 ha wetland

Porters Lake

Rocky Run

Route 207

S.W. CORNER 02324 138

L-16-1 02-08-10 11D/11 1:10 C
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
+8 months

Considerable deposit of seaweed wrack after the winter

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

Rare Event
New channel, less wrack, vegetation growth, sand deposition & wrack burial
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.
2 years later - little wrack and no channel
Little wrack and no channel
April 2015

+8 months later

Very large accumulation this year!

Long, hard winter!
~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.
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!
~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

~3 weeks after construction

New channel
Odour levels typical of coastal areas
August 2015

Most of wrack gone!

~6 weeks after construction

Most of wrack gone!
September 2015

~3 months after construction
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.
Larger crossings = healthier systems
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
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.