

Estuary Watch 2013

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Estuary Watch Pilot

- Documenting anoxic events across the province will help in understanding them.
 - It is useful to collect the same information, collected in the same way, over a period of time
 - Possible Indicators
 - Annual start date of sea lettuce growth
 - Amount of sea lettuce present
 - Date of onset of anoxic events
 - Occurrence of anoxic events (how many times in a season?)
 - Duration of anoxic events
 - Intensity (severe odours, severe discolouration vs. mild odours and slight discoloration).
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Estuary Watch Pilot

- 2013 a success!
 - 6 estuary Watch Logs completed and submitted
 - Hunter Creek, Baltic River, Taylors Pond, Harding Creek, Sutherland Creek and Long River
 - Impressed with the level of dedication – daily records over a period of several in several logs.
 - Good information collected
 - Helpful for understanding the occurrence (or absence), duration and timing of anoxic events as well as the growth of sea lettuce
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Hunter Creek

- ~164 observations over 173 days (April 21-Oct. 10)
 - No anoxia despite large mats of mostly dead sea lettuce throughout the summer
 - Sea lettuce growth began in mid May (Victoria Day) and “peaked” around July 21
 - no phytoplankton blooms – only occasional days with green or brown water reported
 - fish in distress noted Sept. 19.
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Baltic River

- 62 observations over 82 days (June 7 to Aug. 27).
 - No severe anoxia but...
 - Discoloured water June 8 – June 11
 - A long period of continuous discoloured water and slight odours from July 12 to Aug. 2
 - An August event (or events)
 - discoloured water and odours from Aug 9 – Aug 12
 - discoloured water and odours from Aug 21 – 24
 - don't know for sure that this was continuous due to a gap in observations
 - Large amount of sea lettuce present over the summer but only a small amount reported to be dead or dying
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Taylor's Pond

- ~120 observations over 124 days (June 11 – Oct. 12).
 - Taylor's Pond in great shape all summer.
 - No sea lettuce or small amount that was mostly healthy
 - Only two days with mild odors reported (July 11 and July 17)
 - Possible phytoplankton bloom
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Harding Creek

- 9 observations between July 9 and Aug 14.
 - Anoxic conditions present July 9 & 10
 - Sea lettuce relatively healthy – only some die-off
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Sutherland Creek

- ~36 observations over 74 days (June 10 – Aug. 23) plus 1 (Oct. 6).
 - 3 “red water” days (June 11, 12, 13)
 - No anoxic events but discolored water July 21 to Aug. 12 (not known if continuous or not)
 - Large mats of sea lettuce present but mostly healthy or small amount of die-off.
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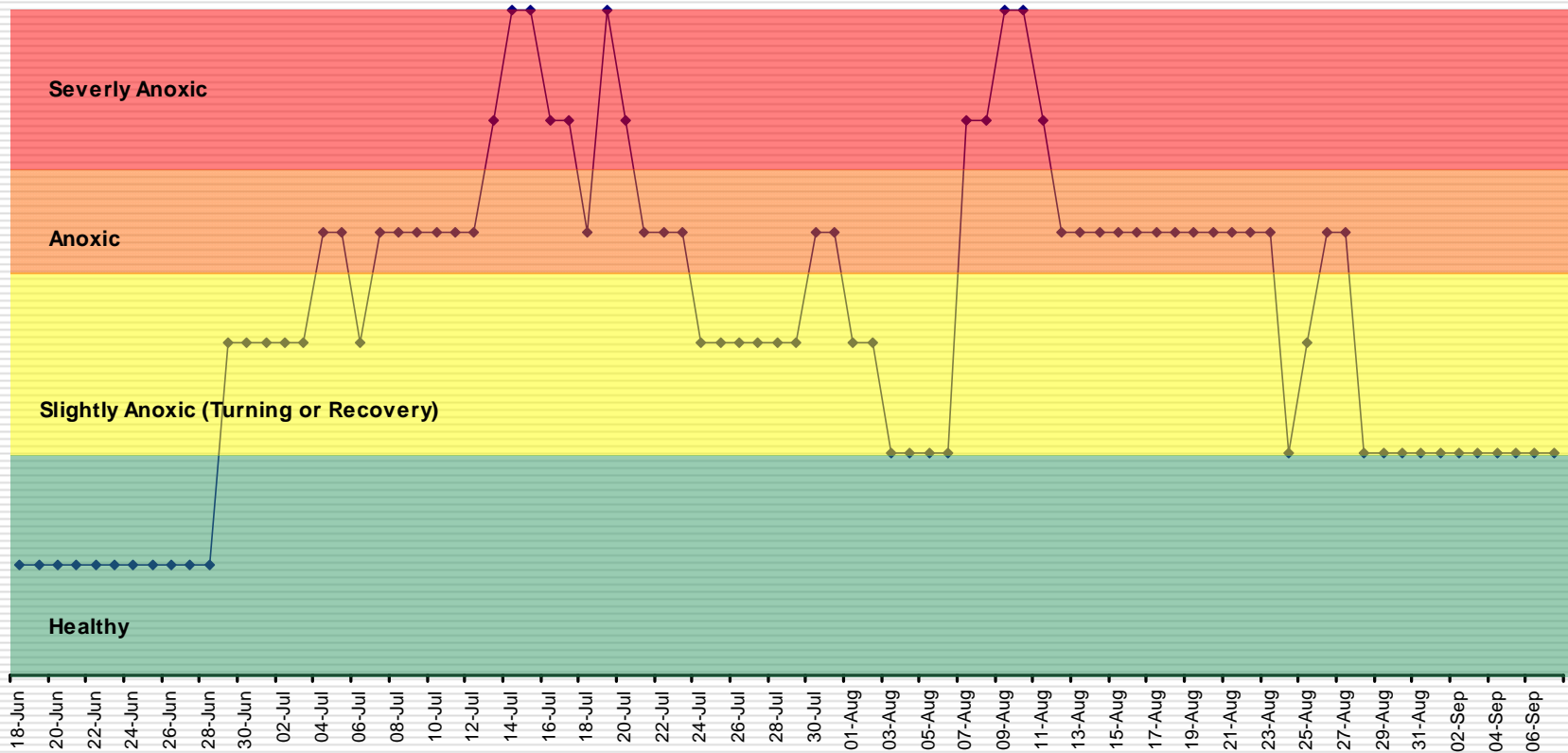
Long Creek

- 83 observations over 83 days (June 18 – Sept. 8).
 - 2 distinct periods of severe anoxia (July 14 – July 19 and Aug 7 – Aug. 11).
 - Extended period of discoloured water and slight odours from the end of June until the end of August (mild anoxia, turning and or recovery from anoxia)
 - Variable amounts of sea lettuce present. Biomass may be going in and out with the tide?
 - Sea lettuce mostly dead June 21 to June 26, July 19 – July 22 and after Aug 6th.
 - Phytoplankton bloom Aug 1 – Aug 6 and from Aug 28 to Sept. 8/
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Anoxic Events

- We have determined that an anoxic event is occurring when at least 2 of the following 3 conditions are present.
 - Very low to nil dissolved oxygen in the water column
 - H₂S odours (from mild to severe)
 - Discoloration of the water column (cloudy green, cloudy grey, milky white)
 - Anoxic events can be classified from mild (mild odours and slight discoloration) to severe (strong odours and severe discoloration)
 - Cloudy green discolorations and/or mild odours may be present when an estuary is becoming anoxic or when it is recovering from an anoxic event
 - Clear green discolorations usually indicate a phytoplankton bloom.
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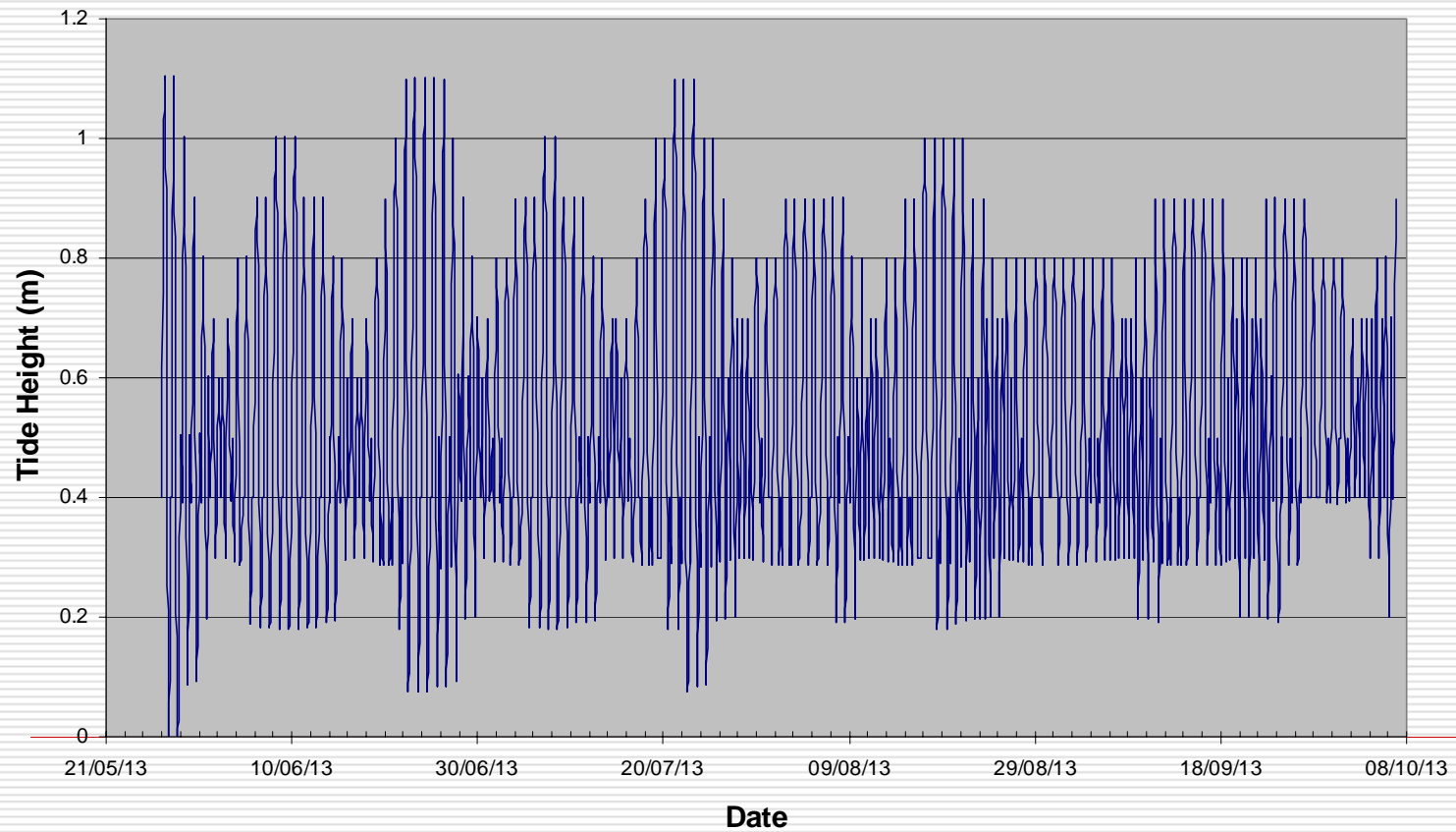
Tracking Water Quality Long River

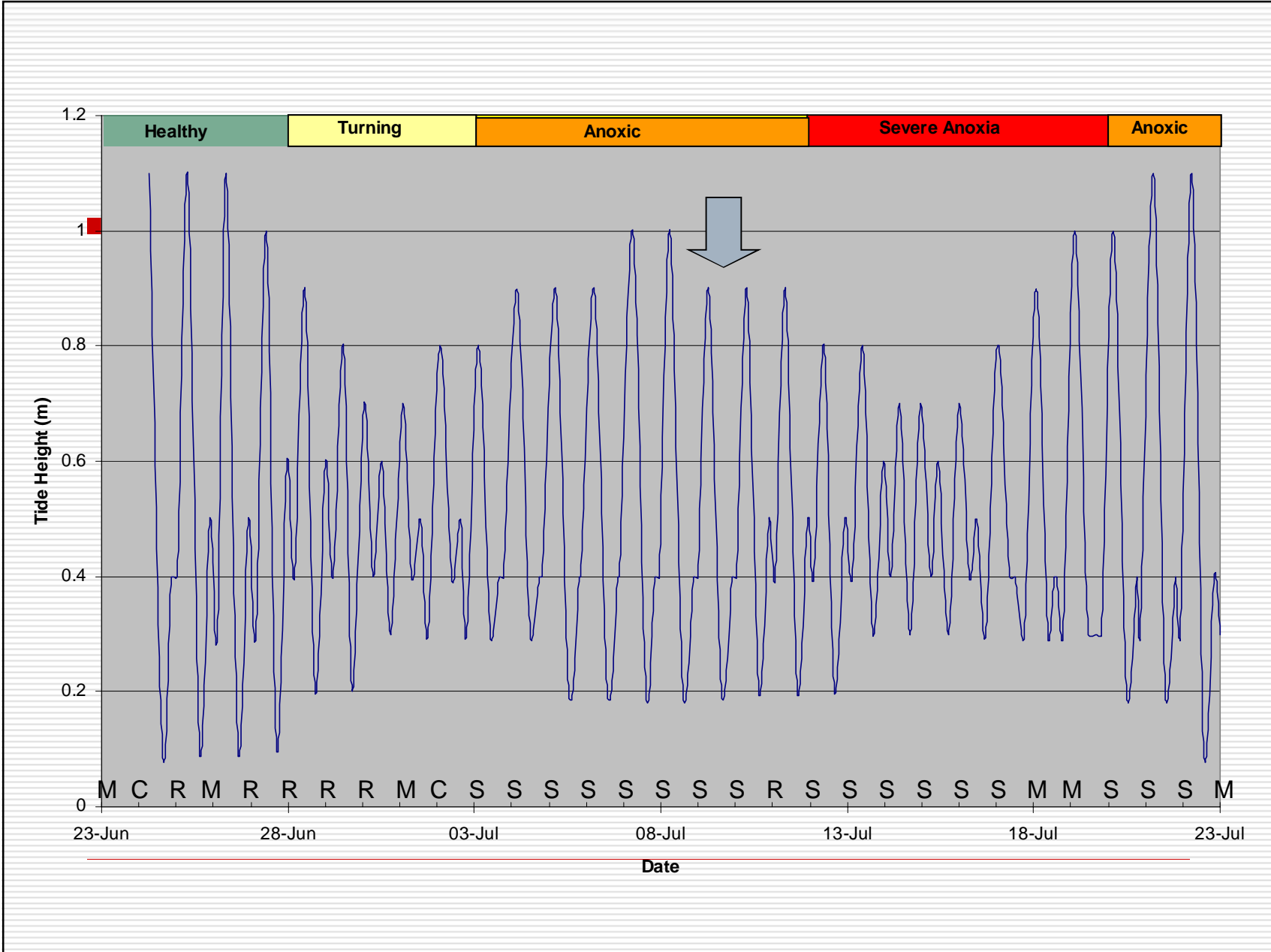


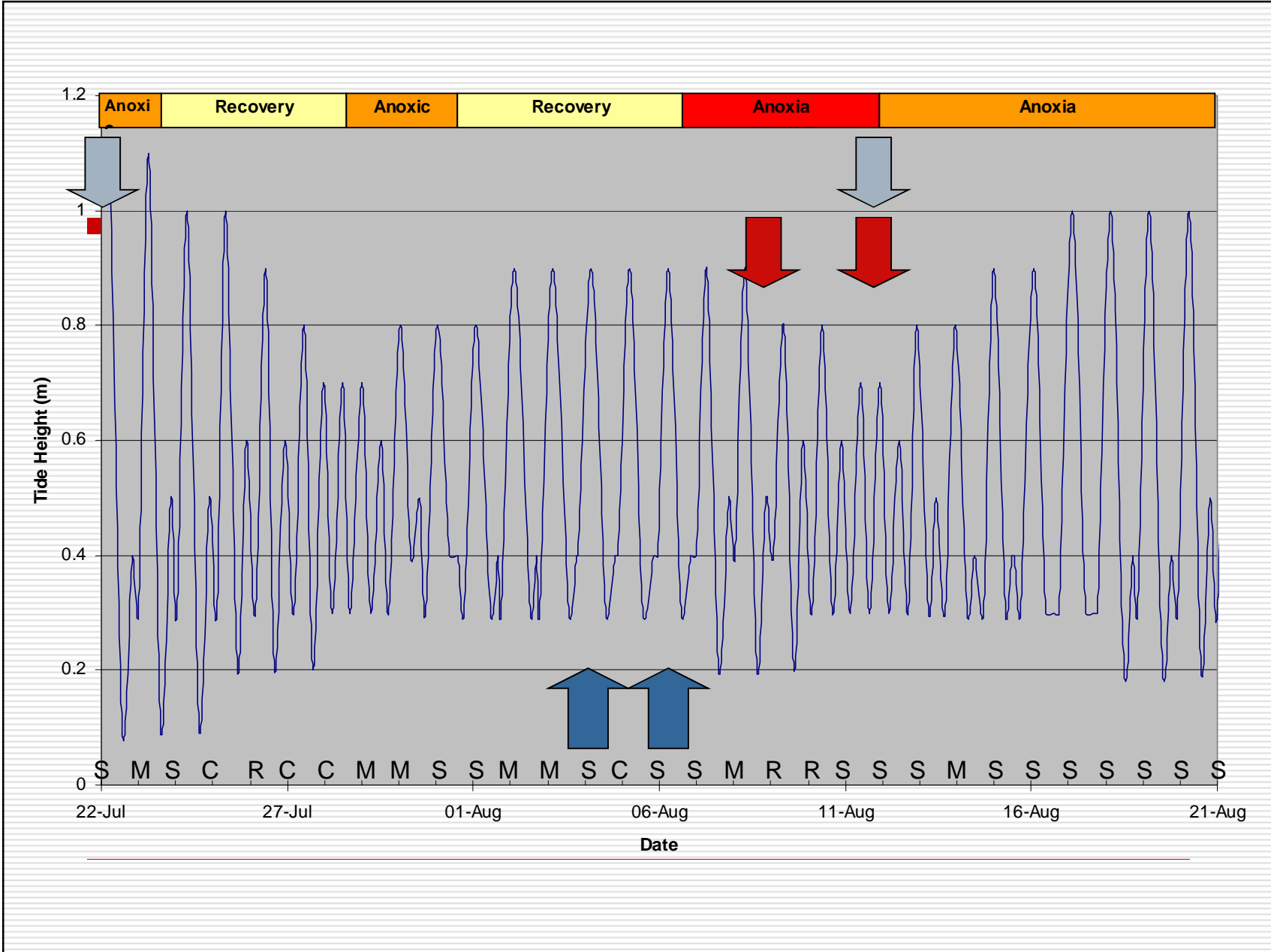
Localized discolouration in the upper estuary only

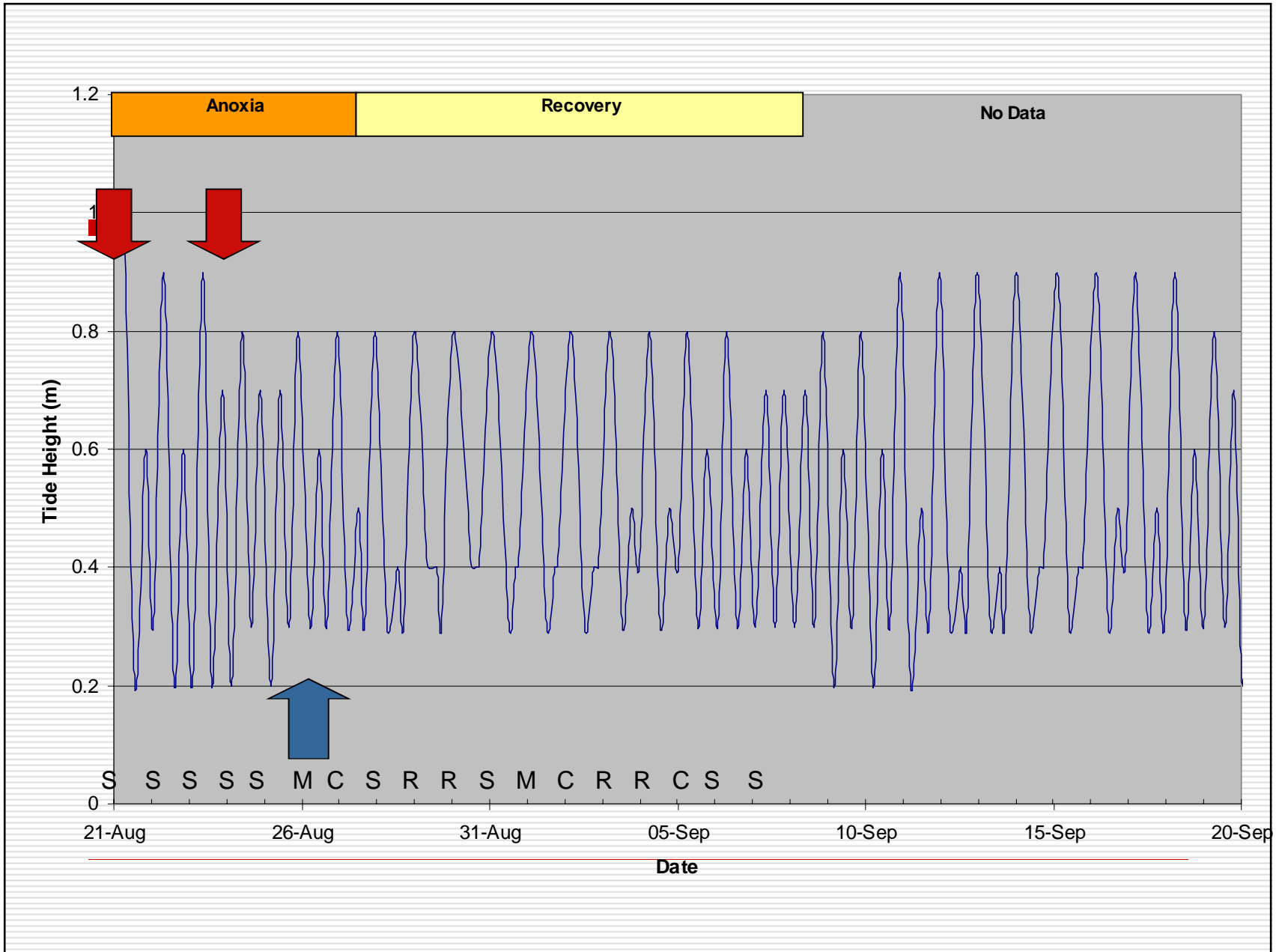
Tide Influence

Tide Height at Rustico, May to October 2013

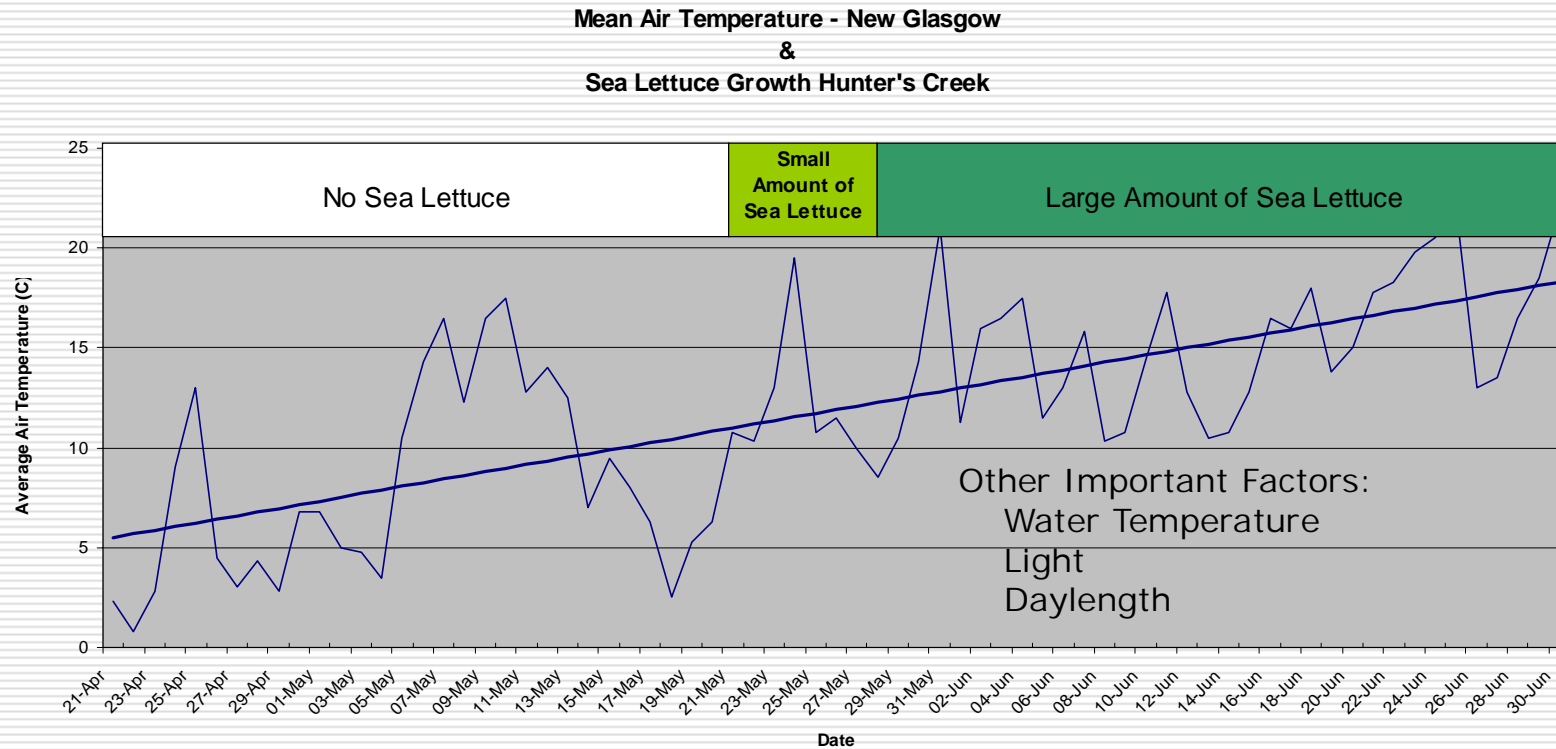








Sea Lettuce Growth and Ambient Air Temperature



Hints for Watchers

- If possible make observation at the same time or tide each day
 - Use a pencil (and eraser) rather than a pen.
 - Pens smudge easily on the waterproof paper used.
 - Report time as AM or PM or with 24 hour format
 - Keep it simple
 - L vs. Low tide
 - M vs. Mid tide
 - H vs. High tide
 - Try to fill in all data for as many dates as possible – the more information available the more that can be gleaned from it. It is best to have daily records or at least records every second day.
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Going Forward?

Things I learned

- Too much information being collected?
 - Important data
 - Date
 - Colour of water
 - Odour present or not? If present how strong
 - Sea lettuce amount (esp. early in the season)
 - Tide
 - Weather
 - Less important data
 - Sea lettuce health
 - Sea lettuce growth (bottom or floating)
 - Not used
 - Fish and shellfish die off
 - Not collected but should have been
 - Size/description of area being observed or extent of anoxic event
 - Water temperature?
 - Data entry
 - Not onerous – only 6 logs this year but could become a big job if this caught on.
 - How to handle?
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Going Forward?

- Feedback from River Watchers
 - What worked?
 - What didn't work?
 - What would you like to see done?
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