baytrends update

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Tidal trends call

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Where we are

- V0.2.7 in spring/summer 2017
  - Functionality for: Censored data and method changes
  - Used for 2016 trends:
    - 1999-2016 for nutrients and chla
    - 1985-2016 for DO, secchi, salinity, temp

- v0.3.3 Dec 2017 deals with:
  - Functionality for: Censored data and method changes
  - Flow or salinity-adjustment
  - All combinations of those
  - Testing underway to use for 2017 trends

Summary of GAM models →

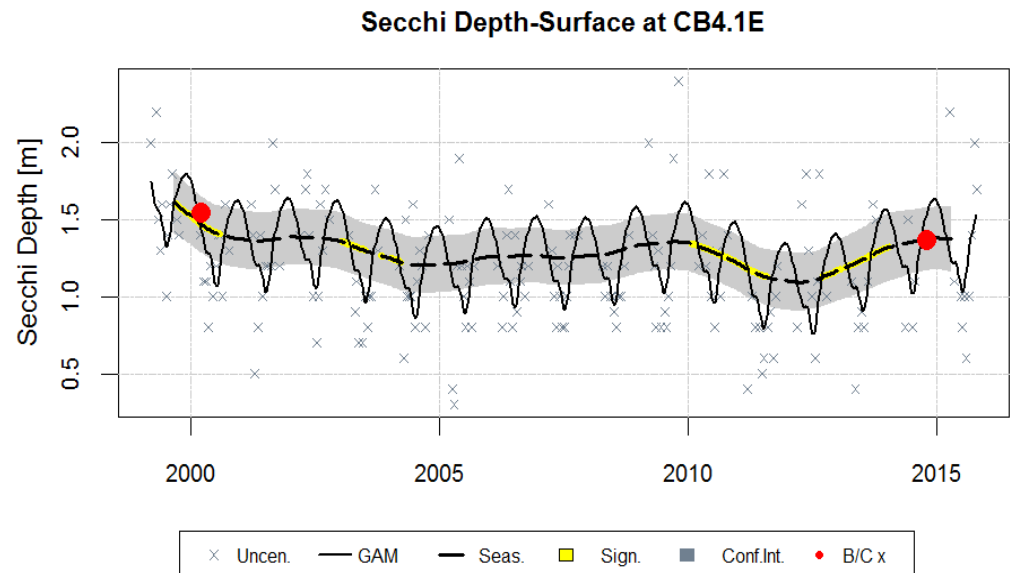## gam1

Linear trend with seasonality

cyear + s(doy)

Total Phosphorus-Surface at TF5.5A
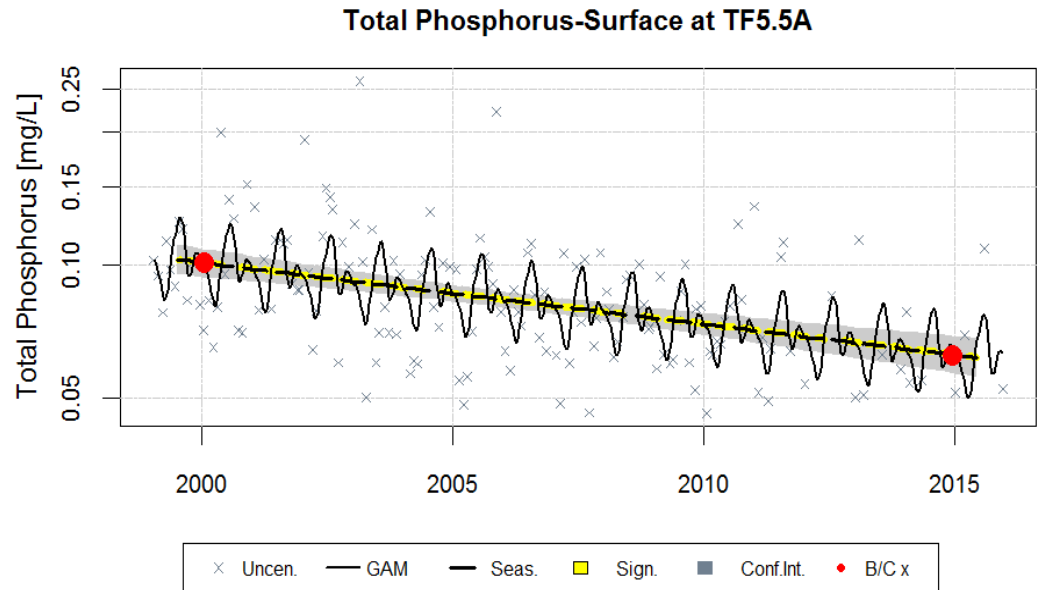
gam2

nonlinear trend with seasonality

cyear + s(cyear) + s(doy)

Secchi Depth-Surface at CB4.1E

gam2

nonlinear trend with seasonality (plus interaction)

cyear + s(cyear) + s(doy) + ti(cyear, doy)

Chlorophyll a (Corrected)-Surface at CB6.2
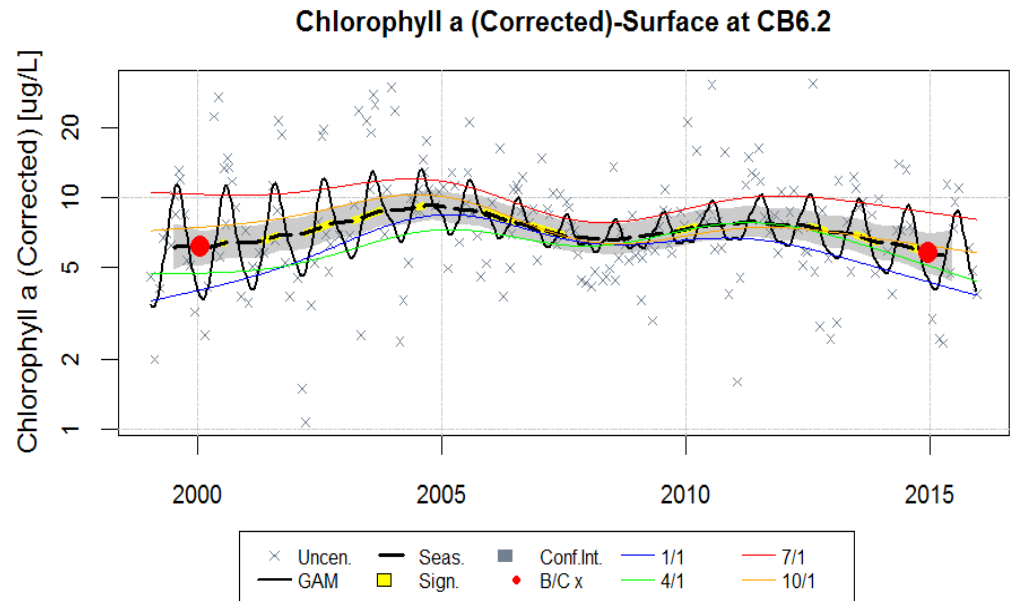
gam3

nonlinear trend with seasonality (plus interaction) AND intervention

intervention + cyear + s(cyear) + s(doy) + ti(cyear, doy)

Total Suspended Solids-Surface at ET2.3
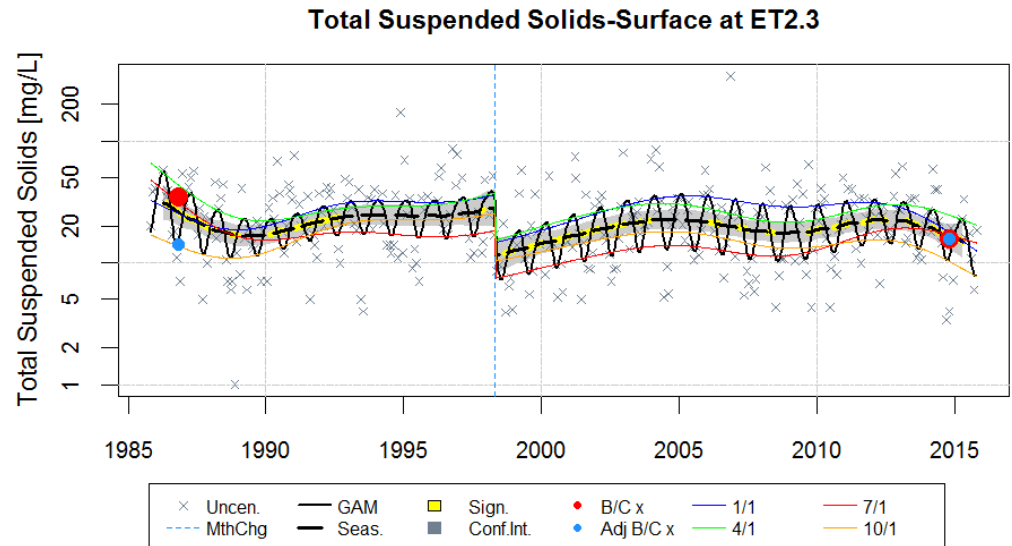
gam4

nonlinear trend with seasonality (plus interaction) PLUS flow or salinity

cyear + s(cyear) + s(doy) +
ti(cyear, doy) +
s(flow_sal) +
ti(flow_sal,doy) +
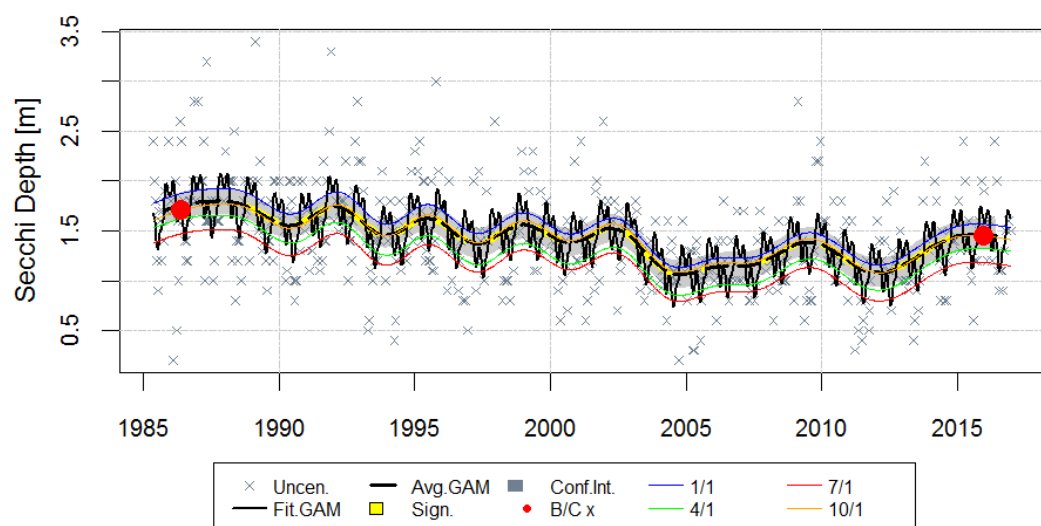ti(flow_sal,cyear) +
ti(flow_sal, doy, cyear)

Flow terms

What it looks like with gam2:

Secchi Depth-Surface at CB4.1C
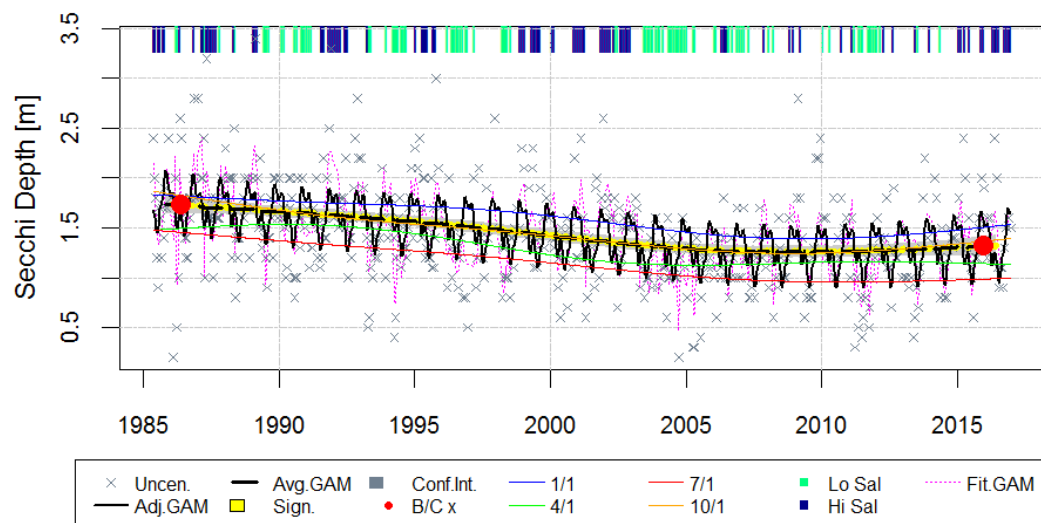

Secchi Depth-Surface at CB4.1C

gam5

nonlinear trend with seasonality (plus interaction) PLUS flow or salinity AND intervention

Intervention +
cyear + s(cyear) + s(doy) +
ti(cyear, doy) +
s(flow_sal) +
ti(flow_sal,doy) +
ti(flow_sal,cyear) +
ti(flow_sal, doy, cyear)

What it looks like with gam3 (intervention but no flow):

Total Nitrogen-Surface at WT6.1   (Magothy River)

Intervention p<0.001,
Model AIC = -2.61

Total Nitrogen-Surface at WT6.1

Intervention p=0.026
Model AIC = 125
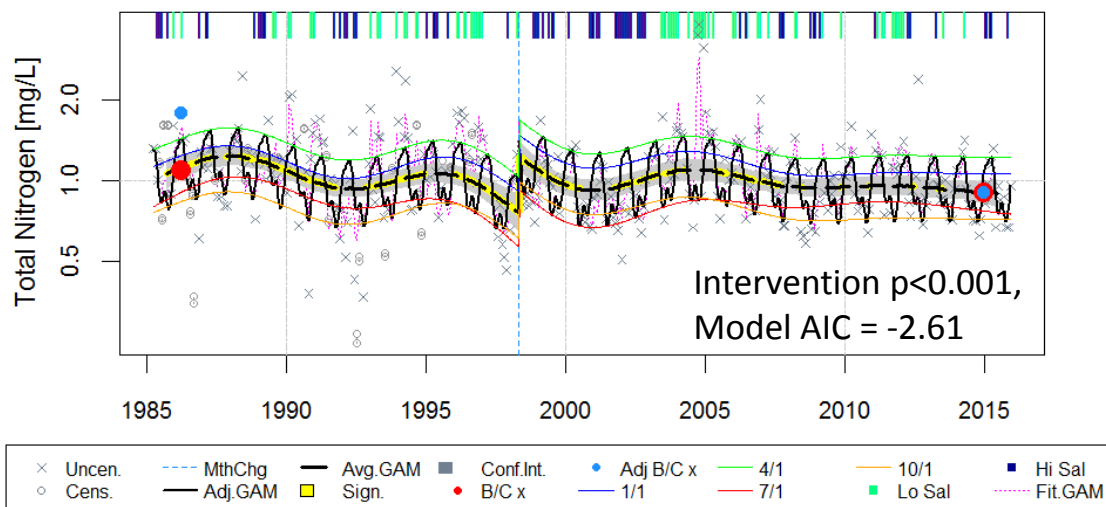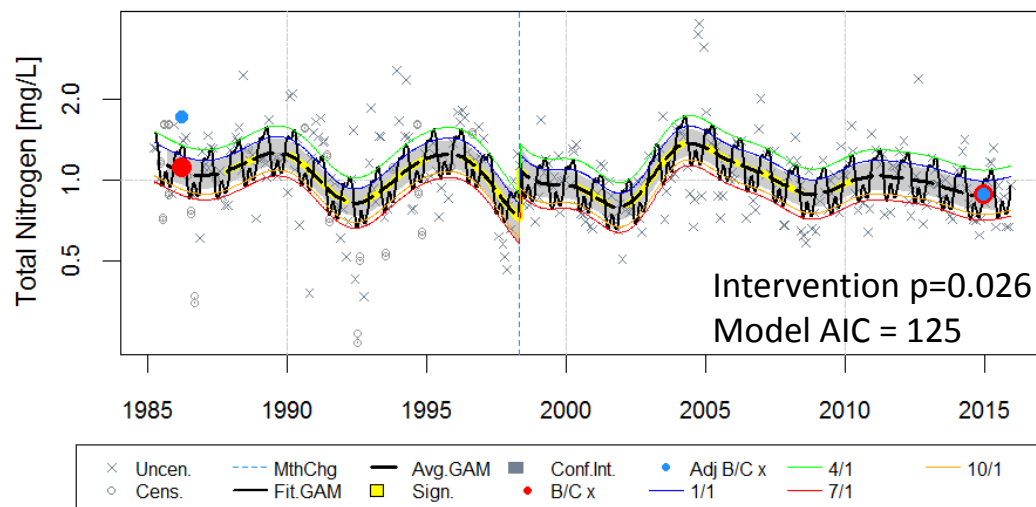
Documentation in the works

- Jon/Erik:
  - flow/salinity data loading
  - water quality data loading

- Next: other documentation we've spoken about – any priorities?

- Also: Manuscript about our GAM method underway