Progress report on FVCOM-ICM application in the Chester River

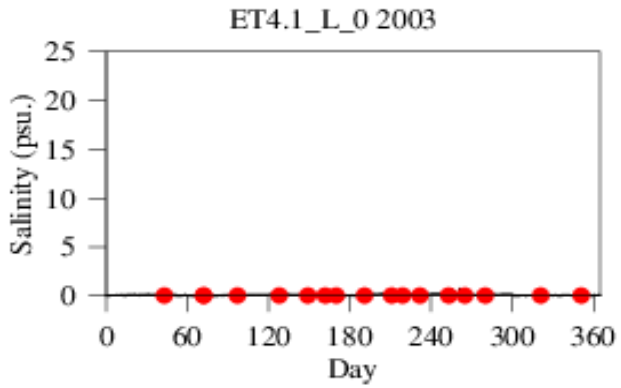
Richard Tian & modeling team
UMCES/CBPO

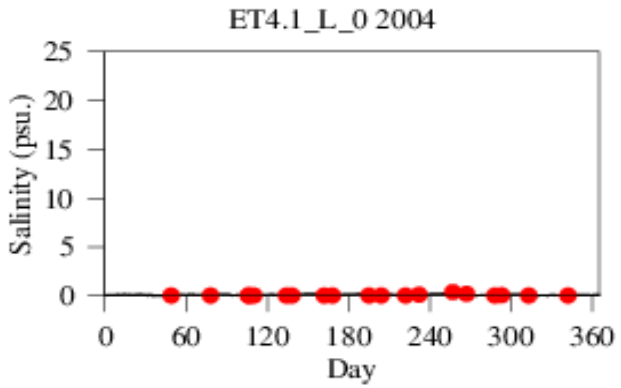
Modeling Quarterly Review Meeting
Nov. 04 2015

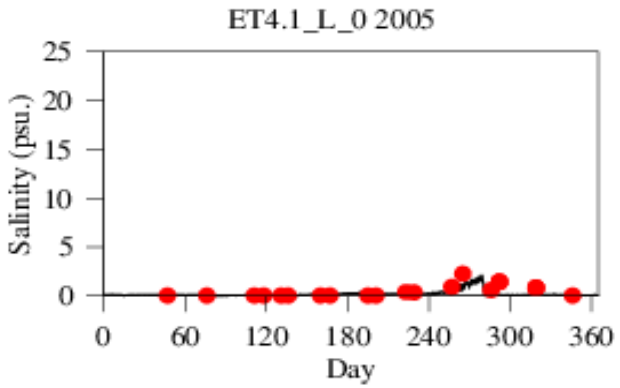
FVCOM grid

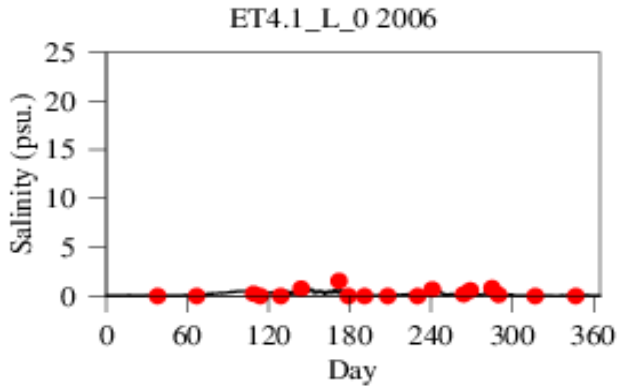

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, IGP, swisstopo, and the GIS User Community

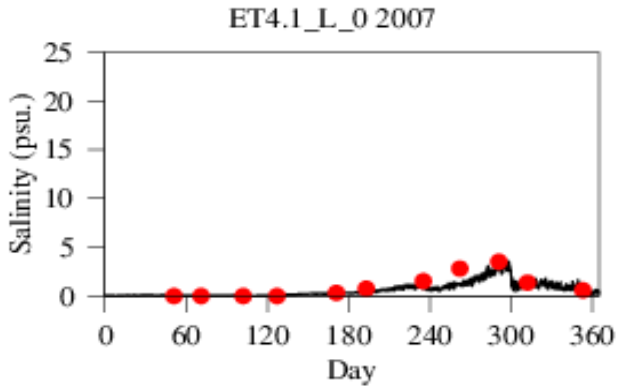
Surface S at ET4.1 (Tidal fresh)

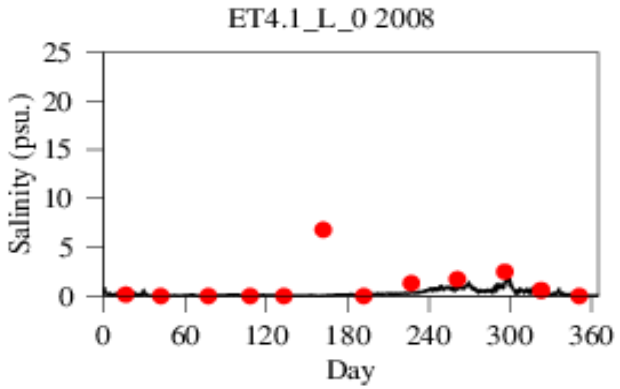


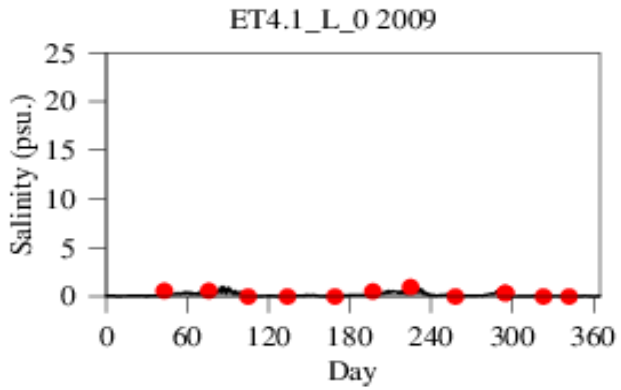


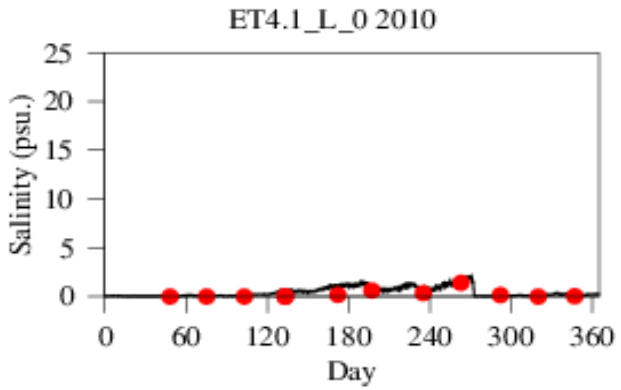


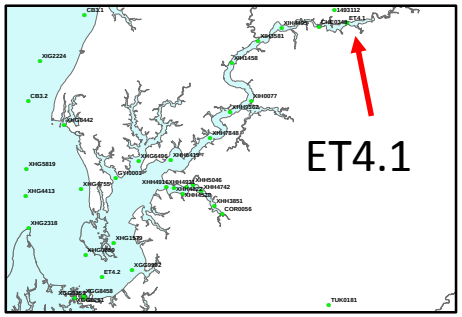




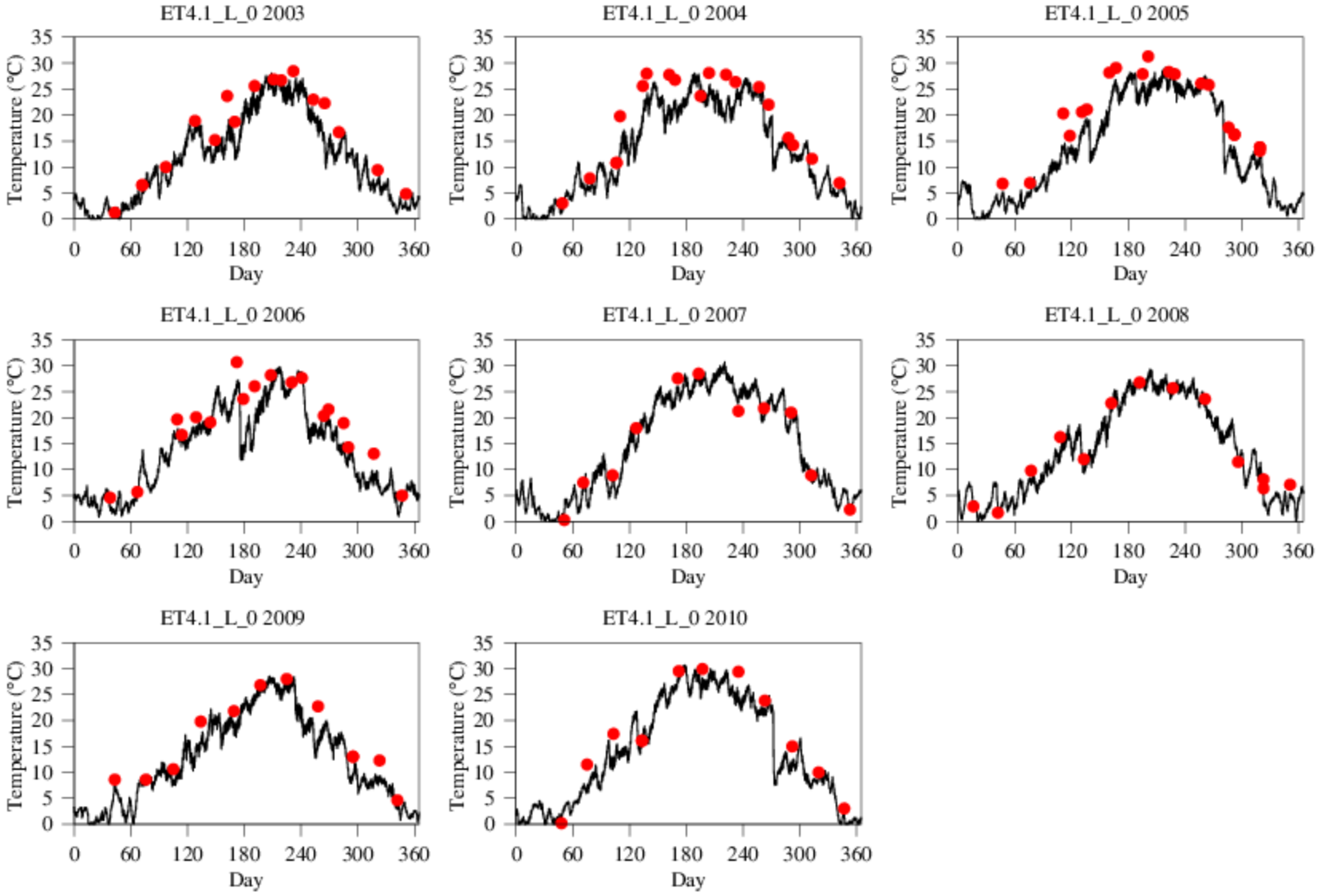




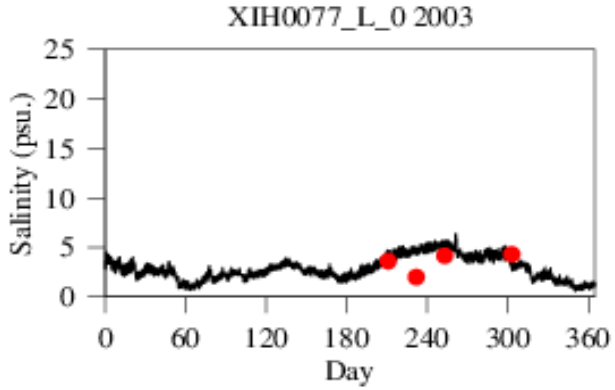


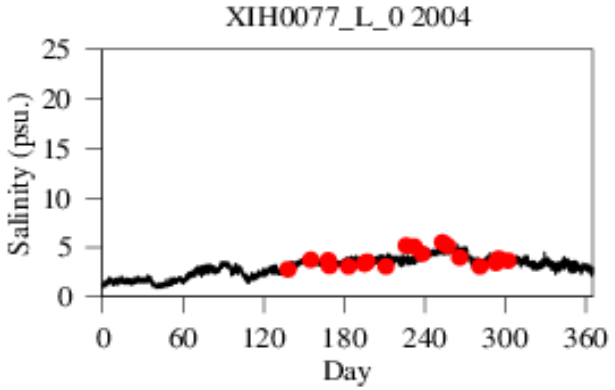


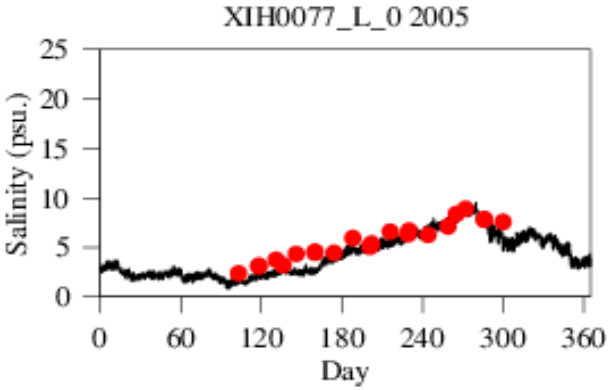
Surface T at ET4.1 (Tidal fresh)

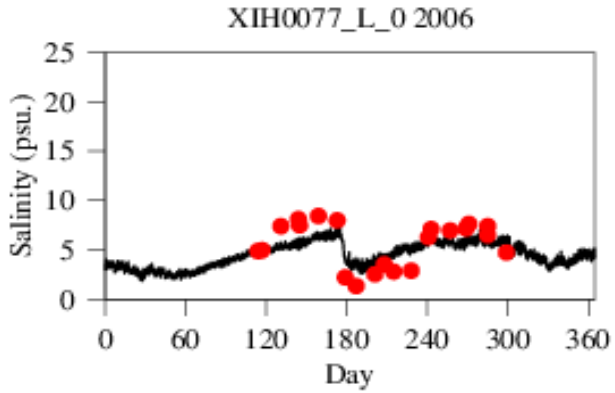


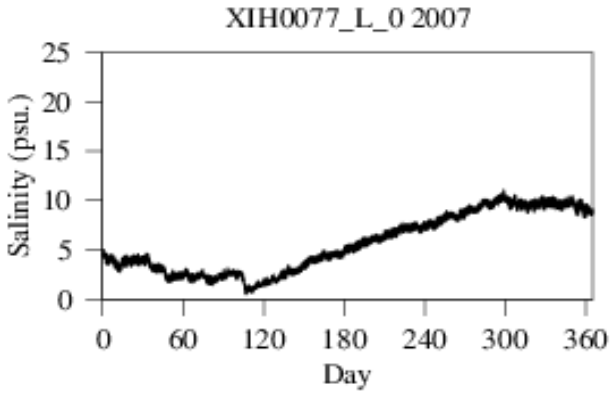
Surface S at XIH0077

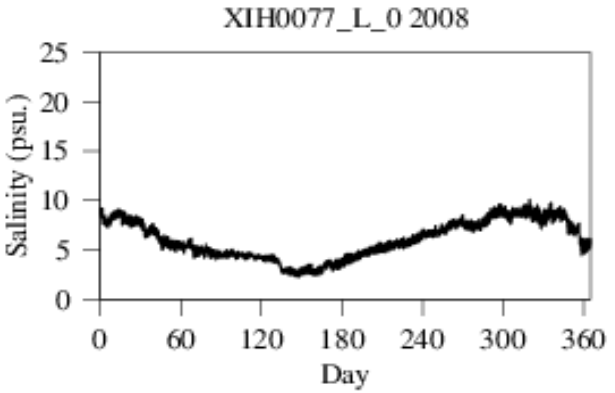


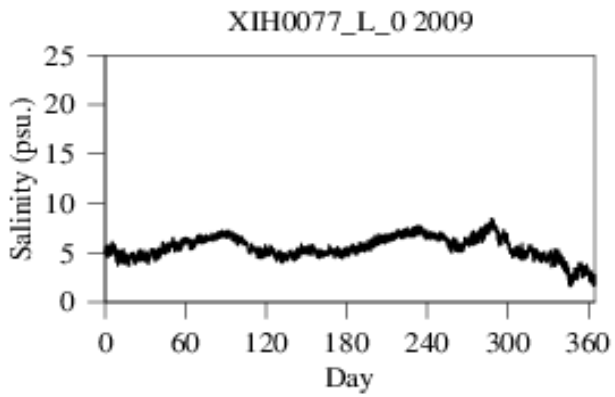


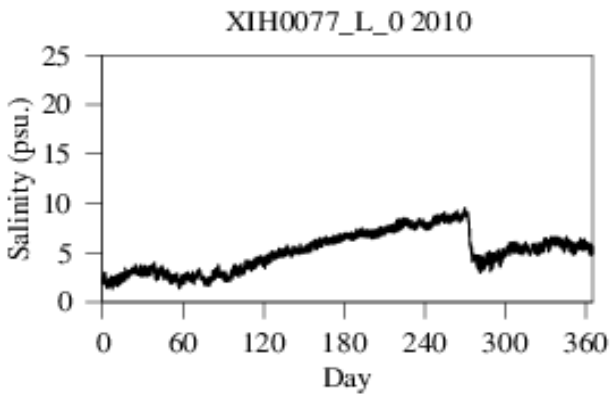


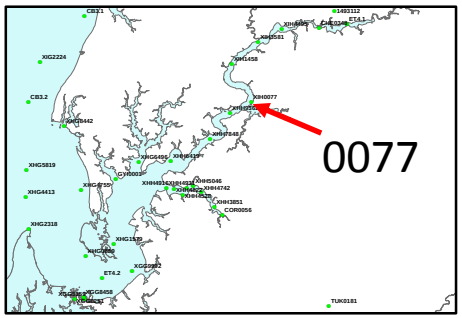




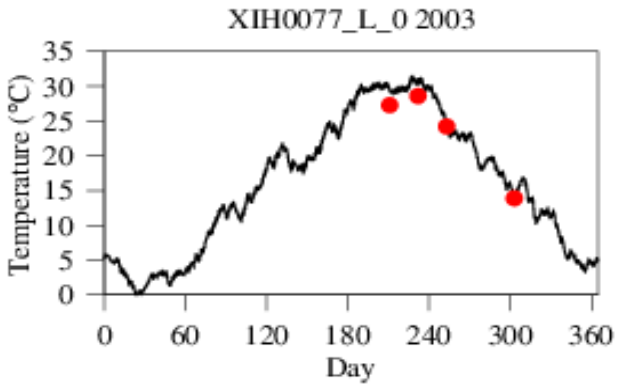


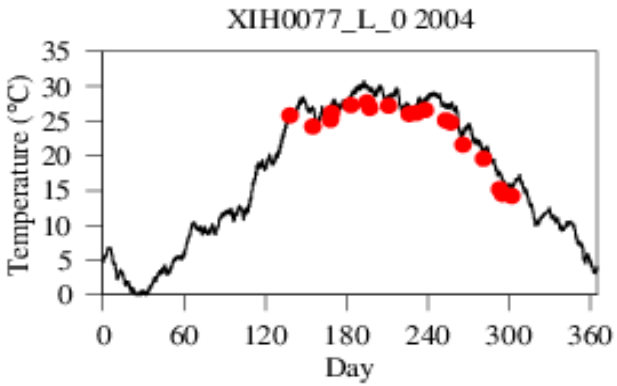


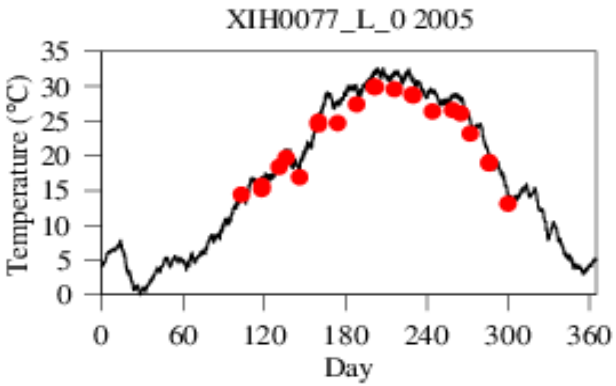


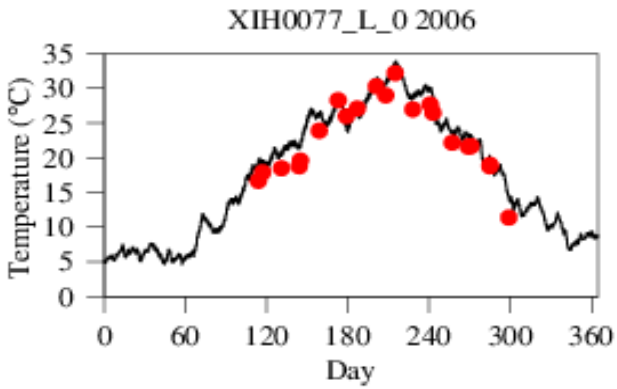


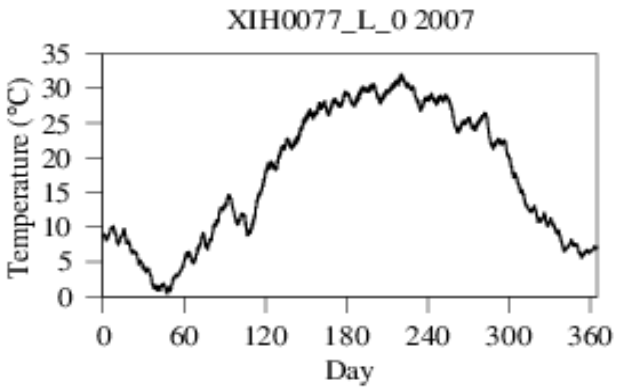
Surface T at XIH0077 (oligohaline)

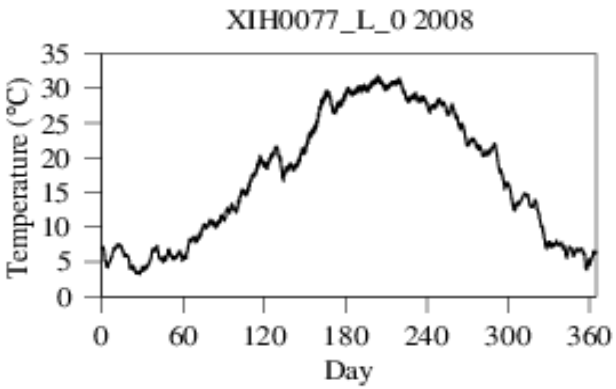


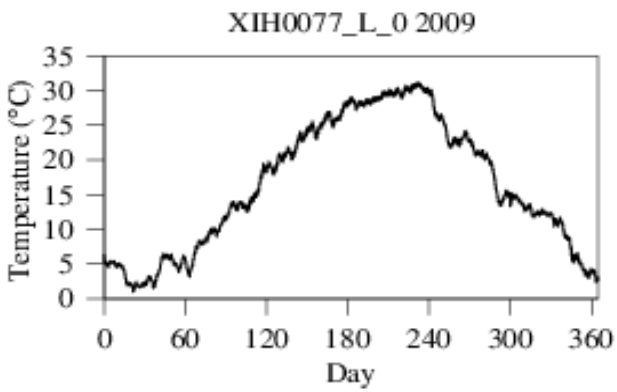


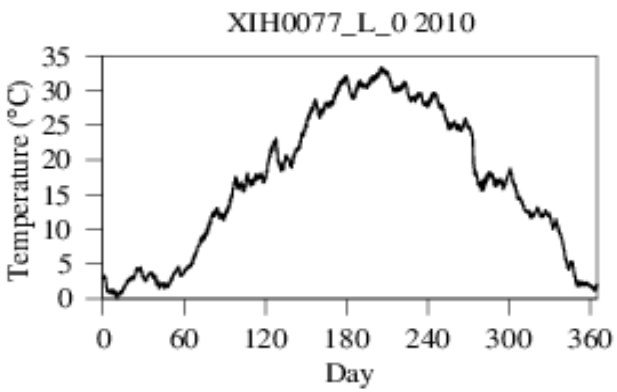




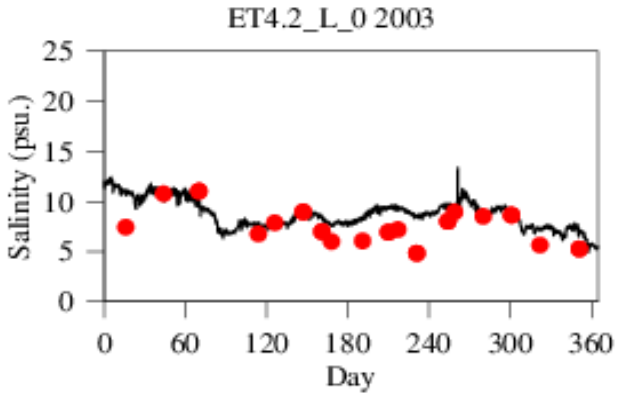


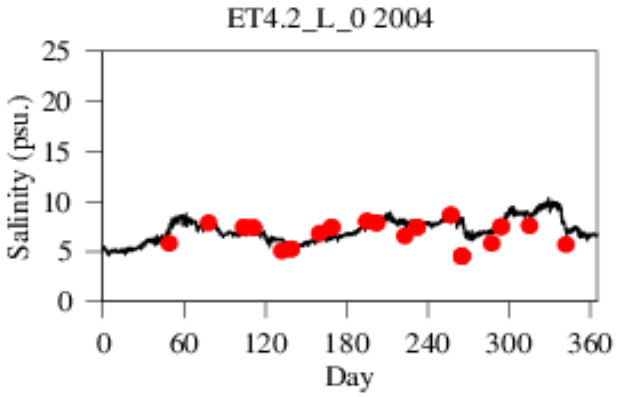


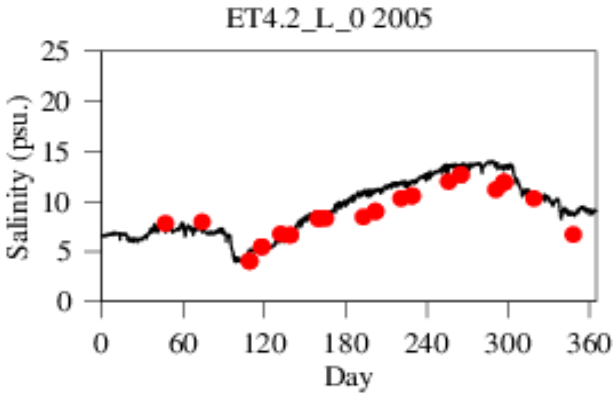


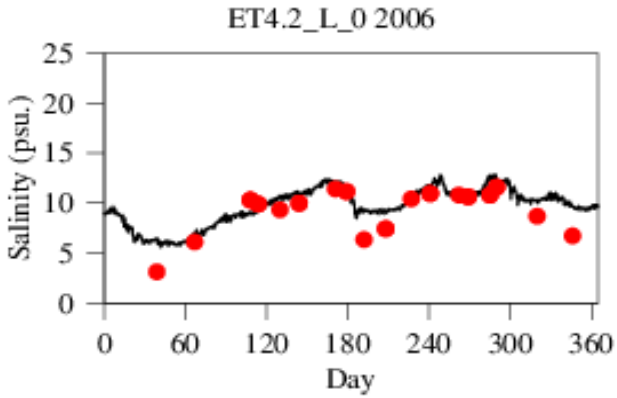


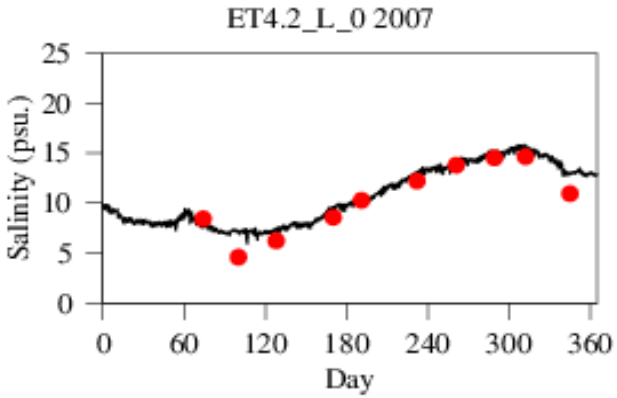
Surface S at ET4.2

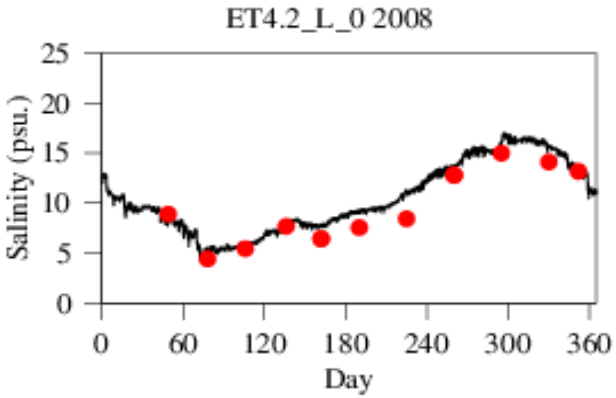


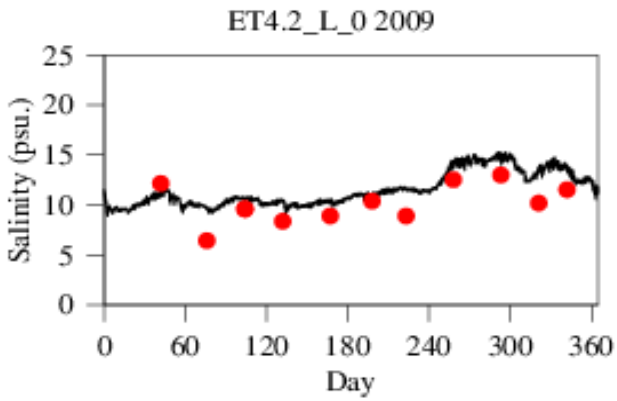


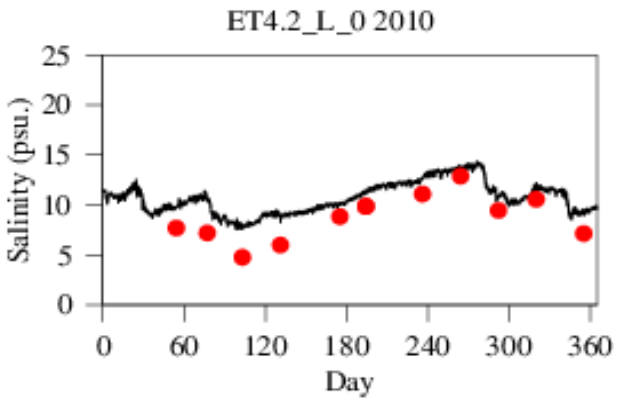


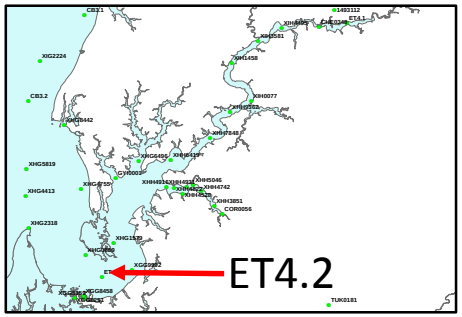




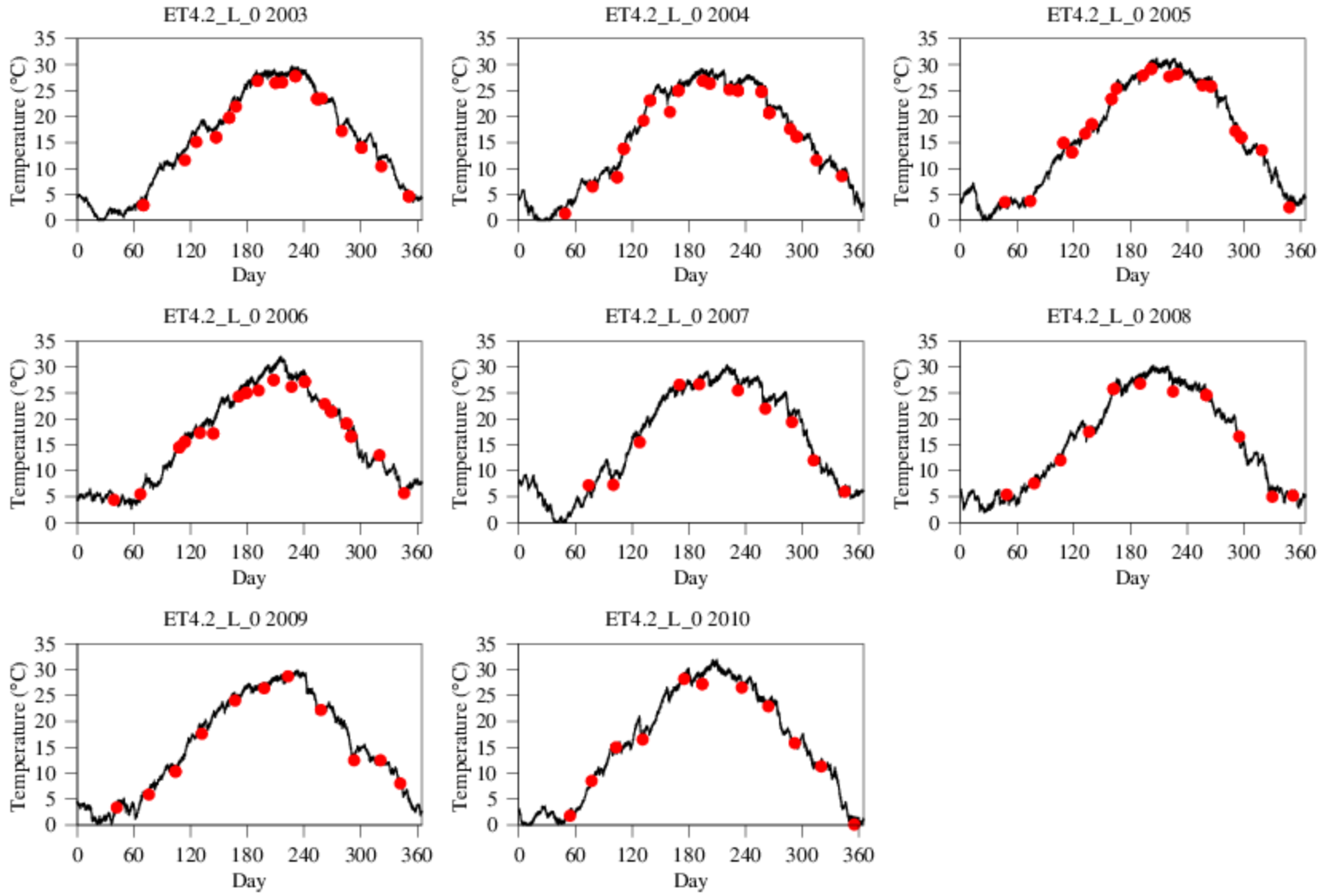




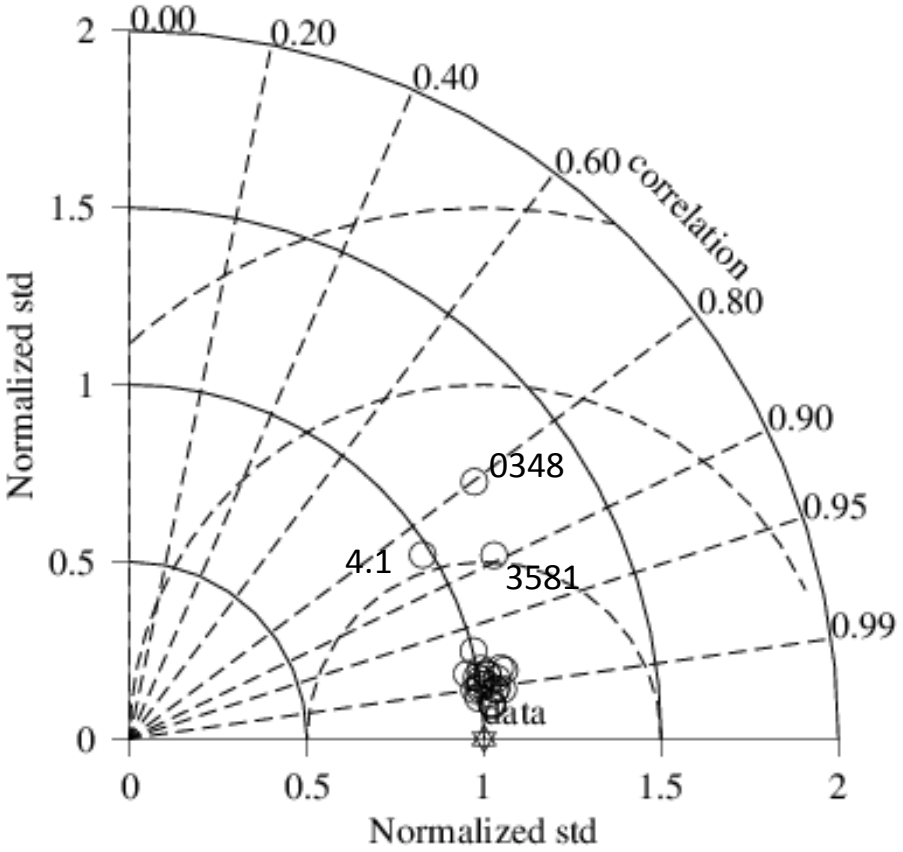


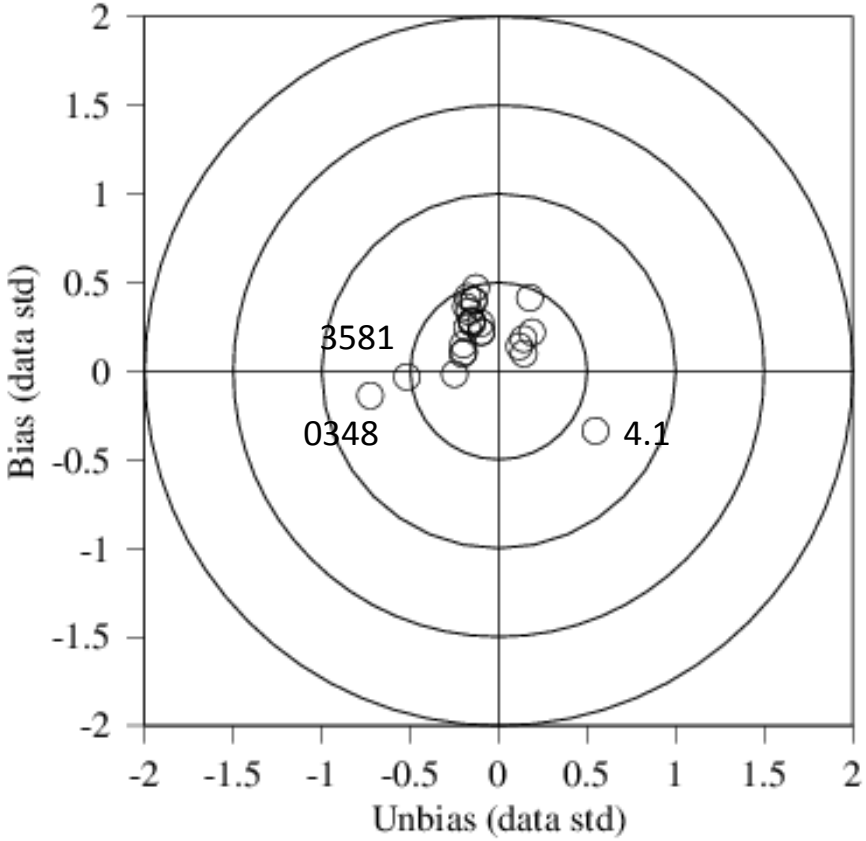


Surface T at ET4.2 (Mesohaline)



Surface T

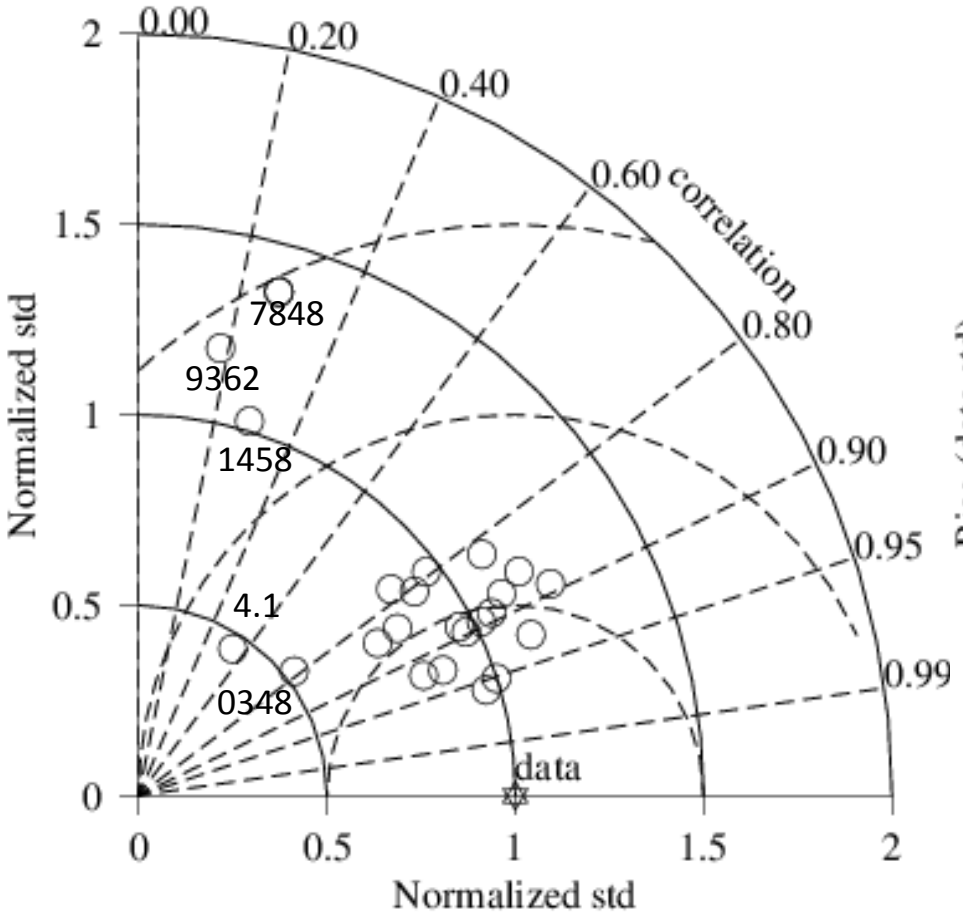


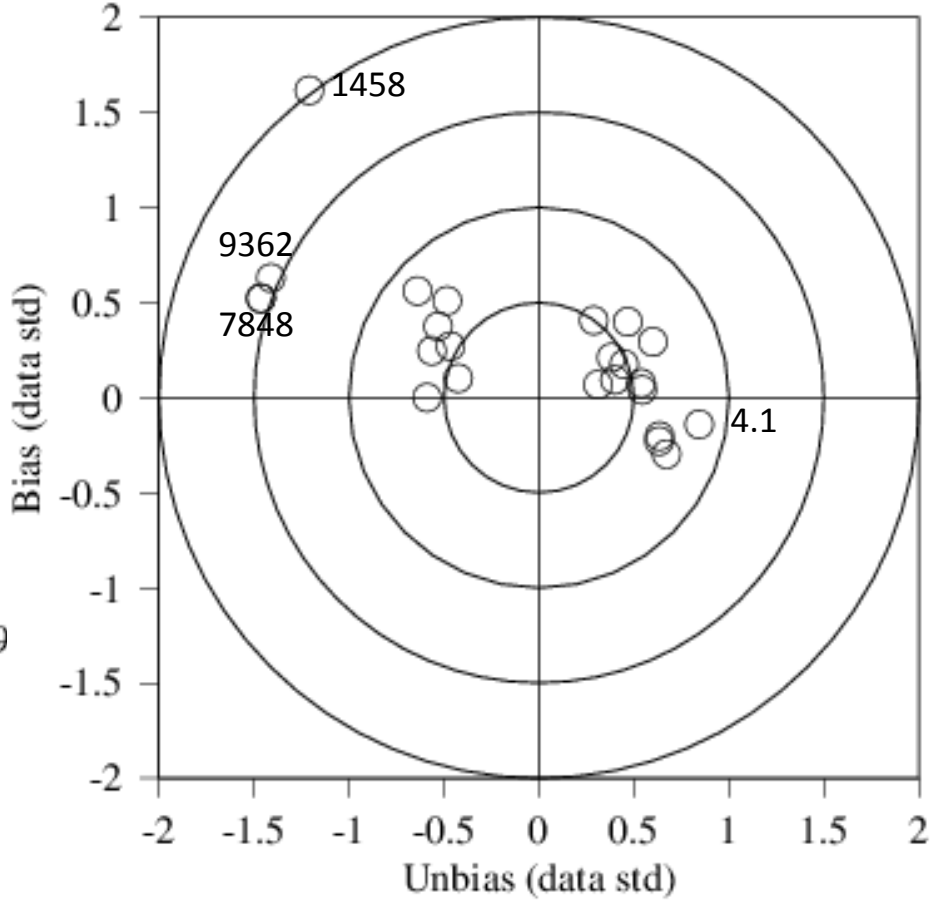


$cRMSE^2 = \sigma_d^2 + \sigma_m^2 - \sigma_d^2\ \sigma_m^2 R$

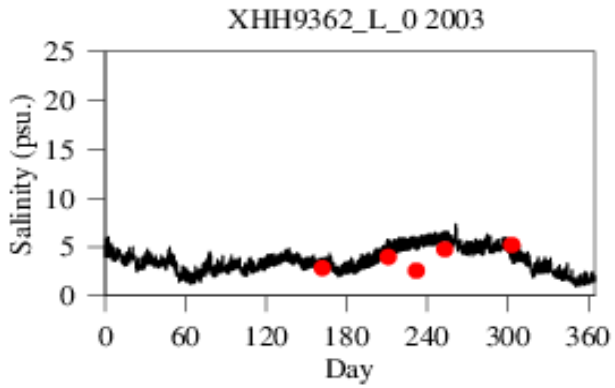
Total $RMSE^2 = BIAS^2 + UNBIAS^2$

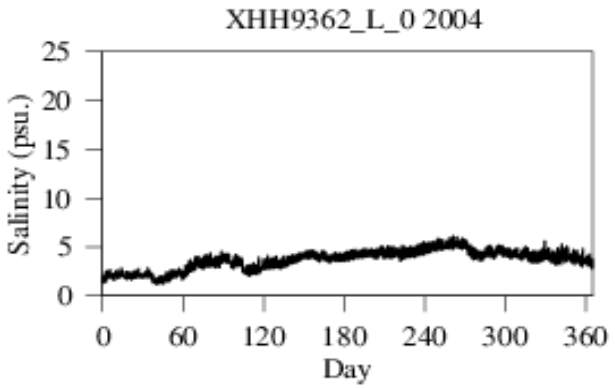
Surface S

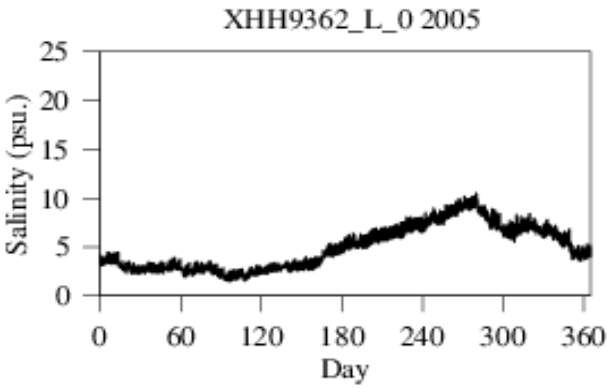

0.00
0.20
0.40
0.60
correlation
0.80
0.90
0.95
0.99
7848
9362
1458
4.1
0348
data
Normalized std
Normalized std

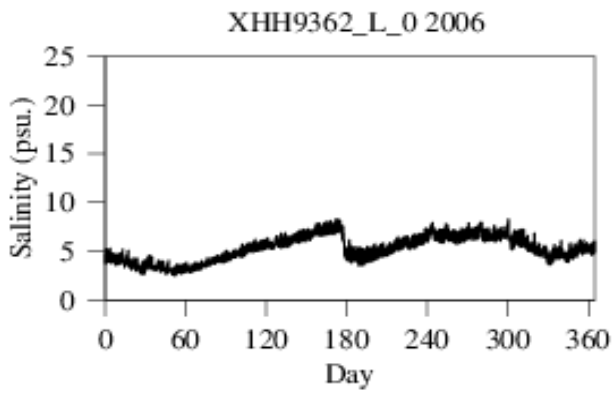

1458
9362
7848
4.1
Bias (data std)
Unbias (data std)

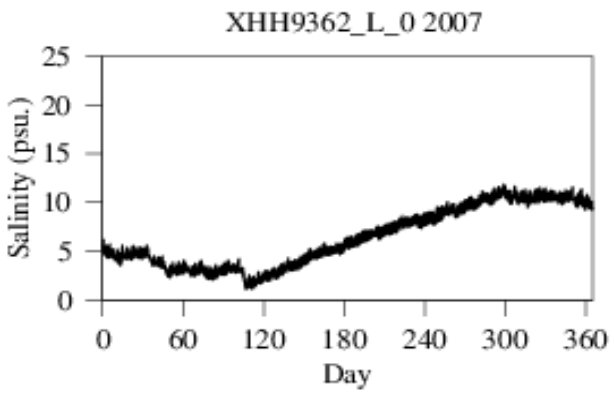
Surface S at XHH9362 (oligohaline)

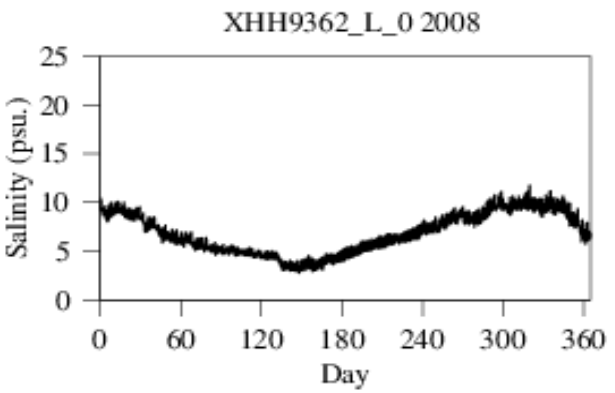


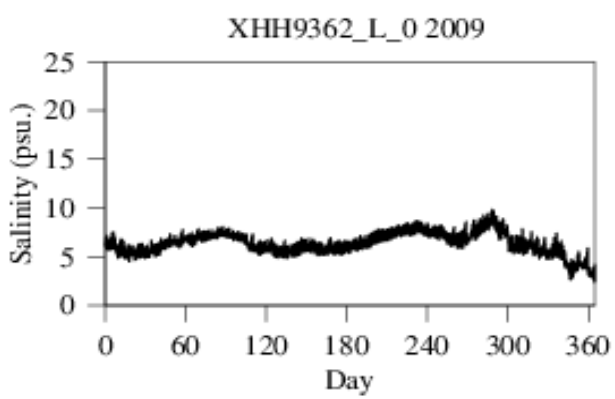


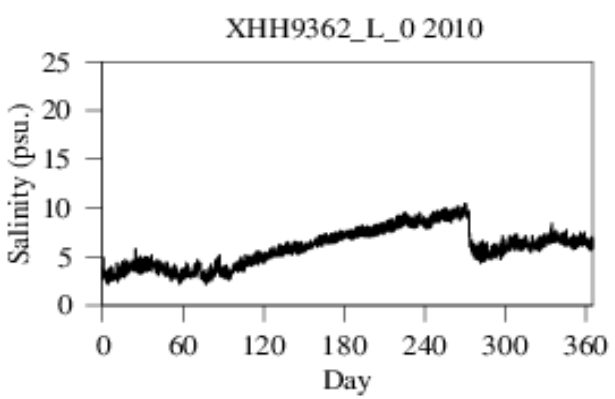


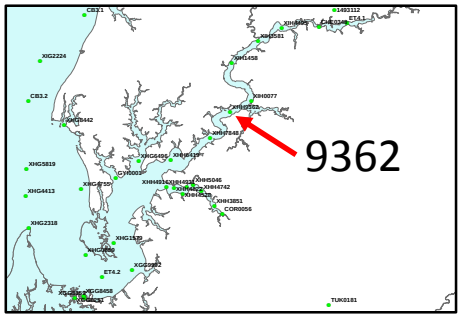




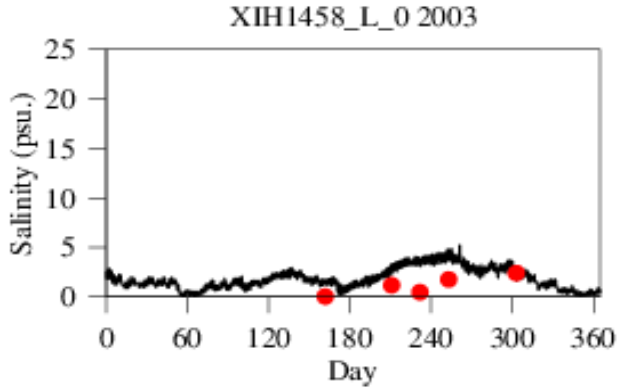


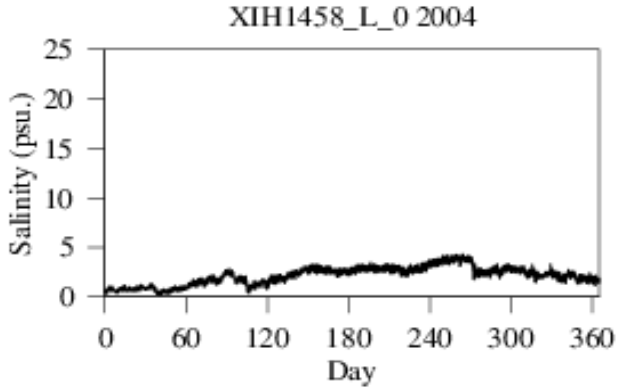


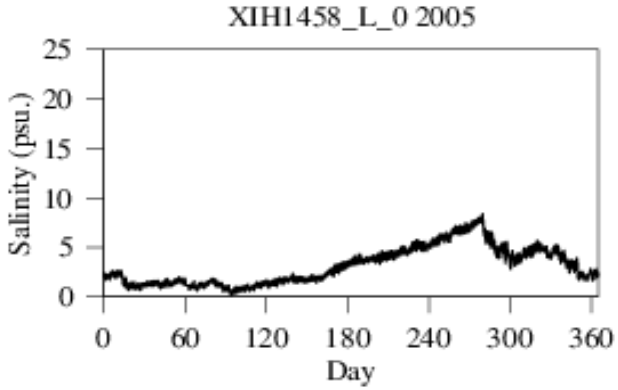


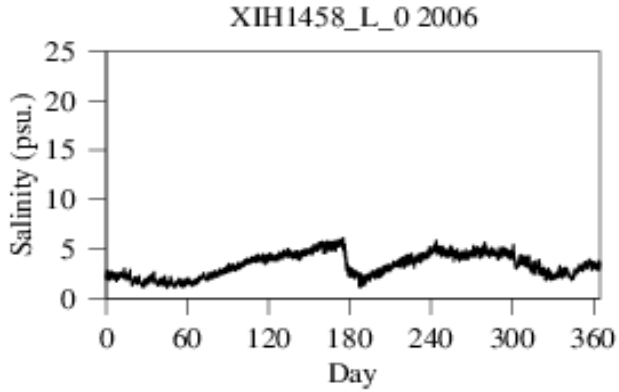


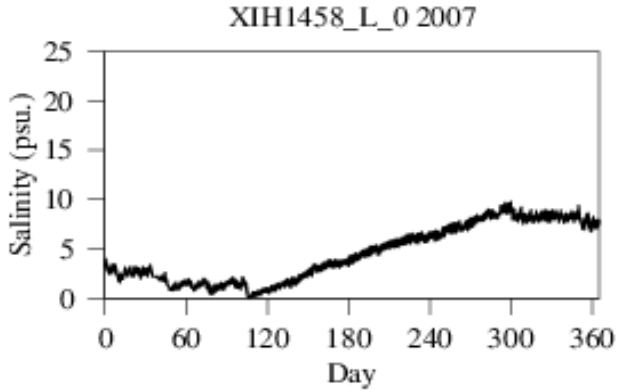
Surface S at XIH1458 (oligohaline)

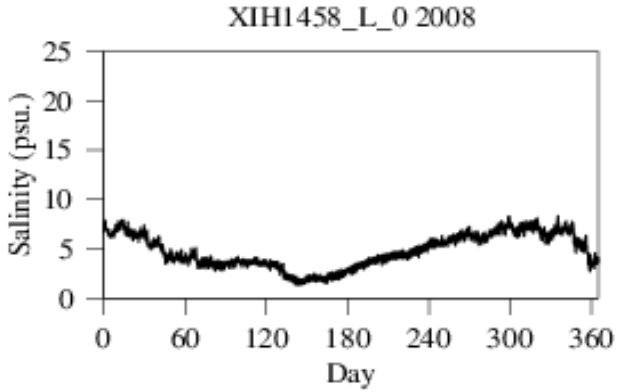


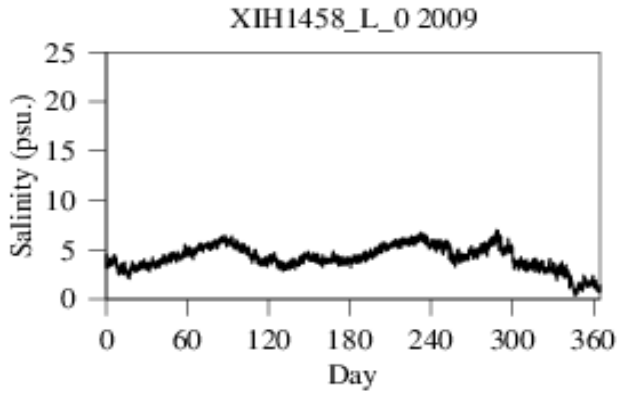


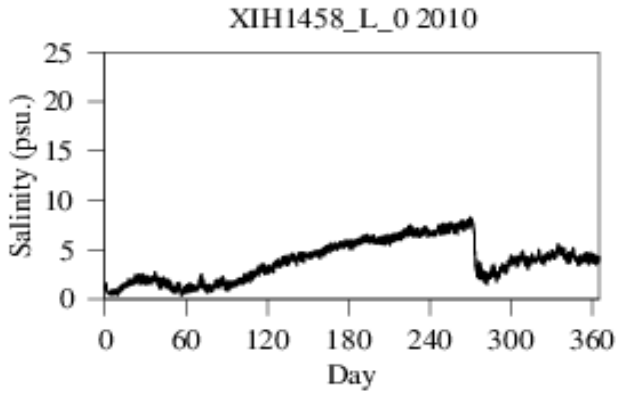


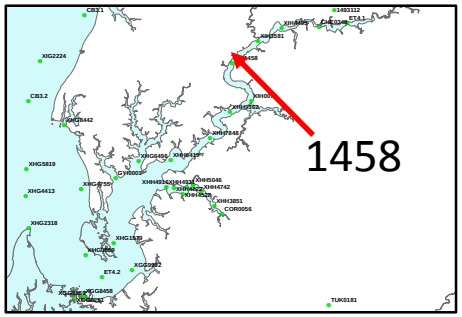




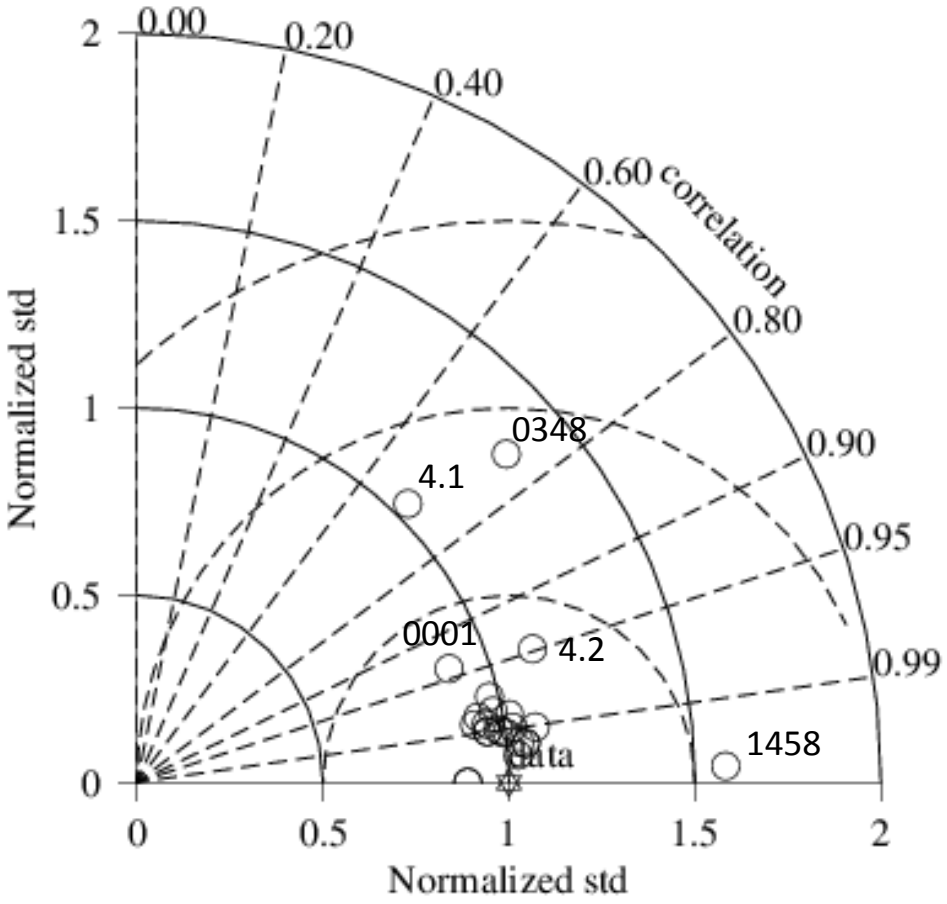


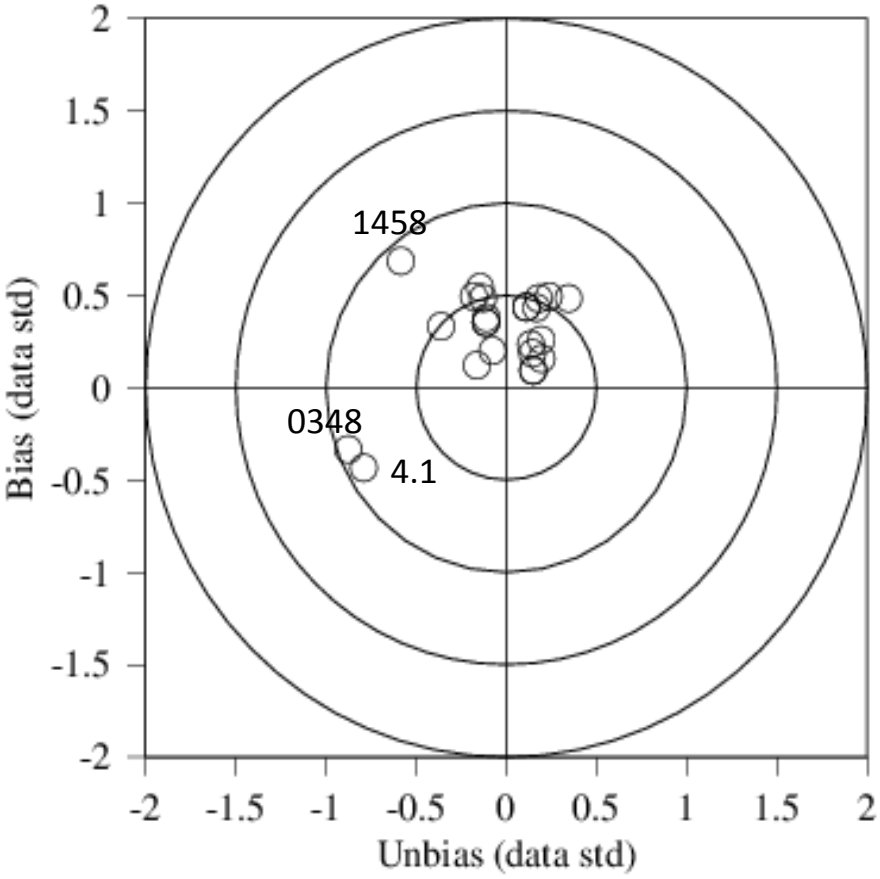




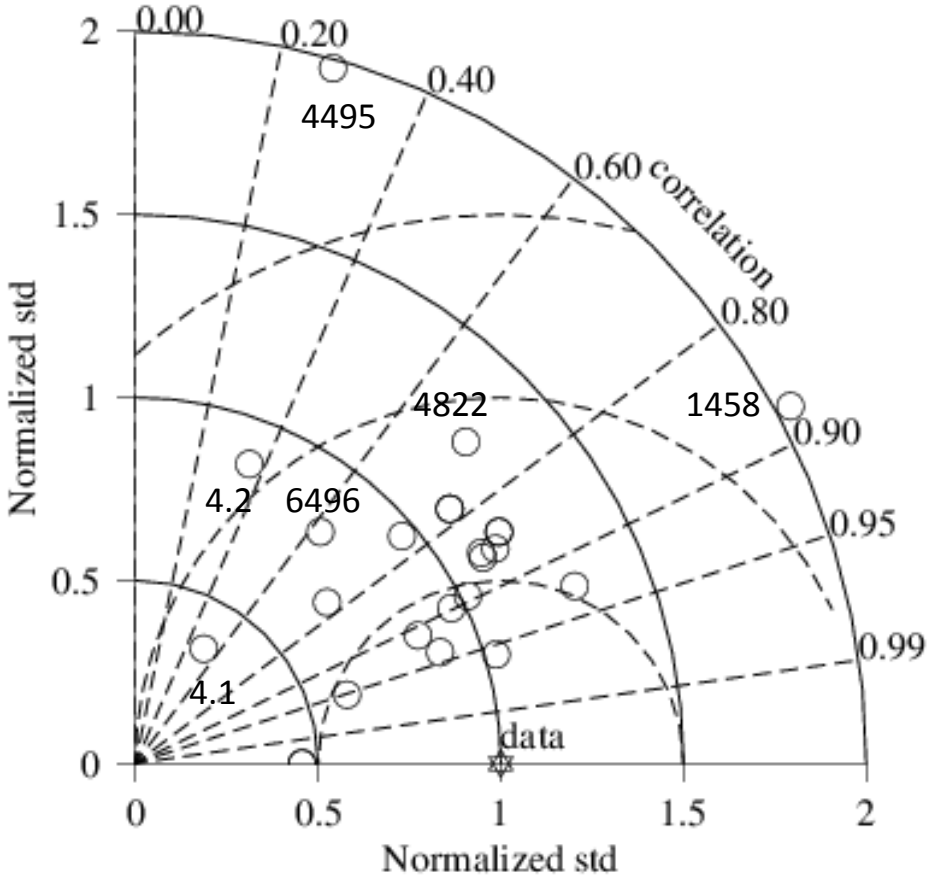


Bottom T


0.00
0.20
0.40
0.60
correlation
0.80
0.90
0.95
0.99
0348
4.1
0001
4.2
data
1458
Normalized std
Normalized std


1458
0348
4.1
Bias (data std)
Unbias (data std)

Bottom S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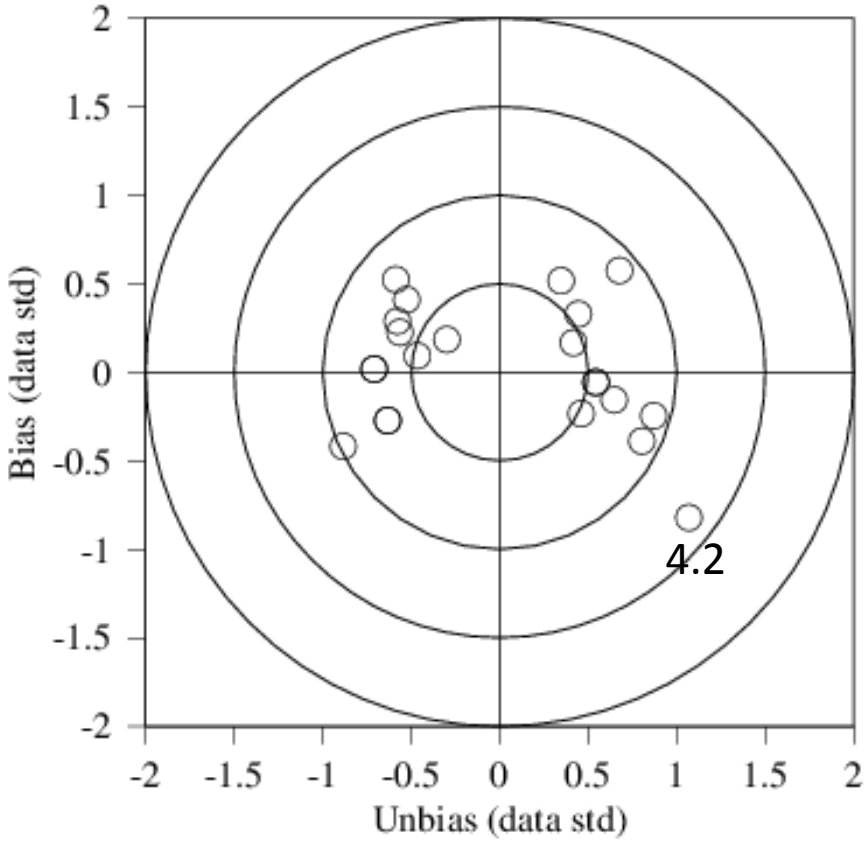
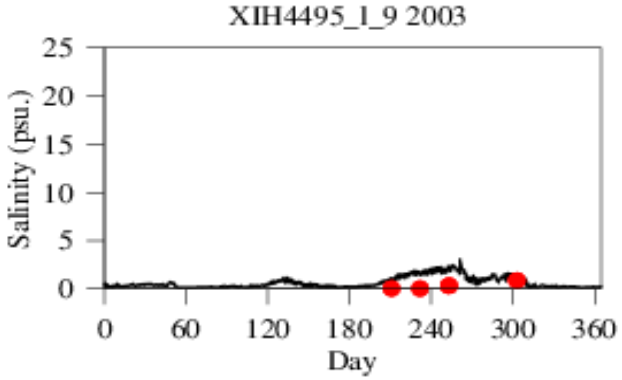
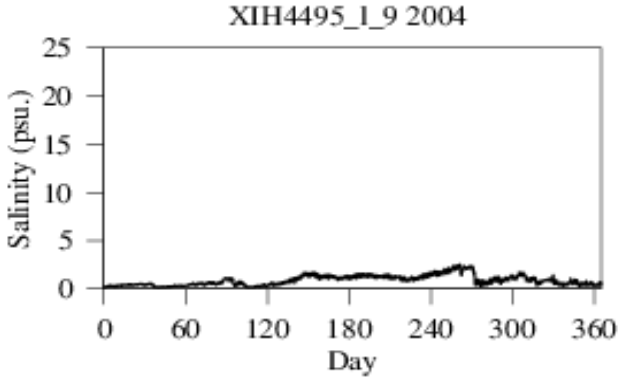
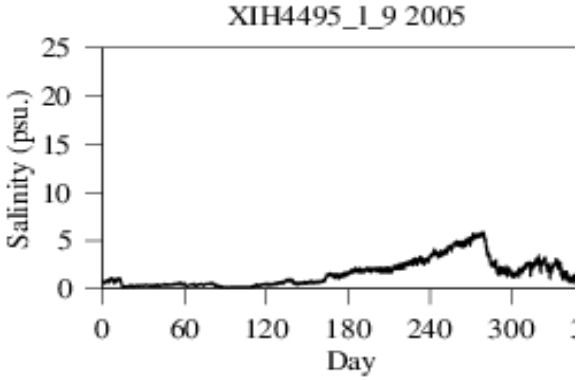
0.20
0.40
0.60
correlation
0.80
0.90
0.95
0.99
4495
4822
1458
4.2
6496
4.1
data
Normalized std
Normalized std
0
0.5
1
1.5
2

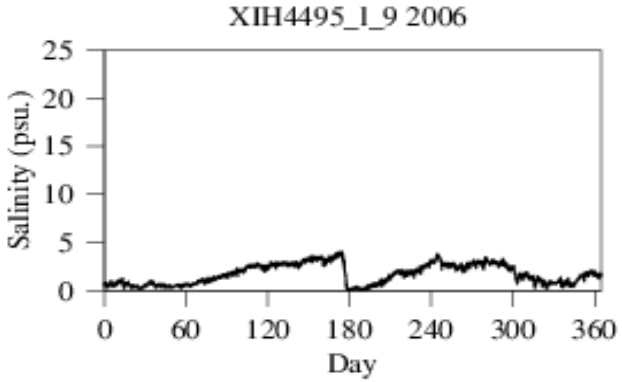

4.2
Bias (data std)
Unbias (data std)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2

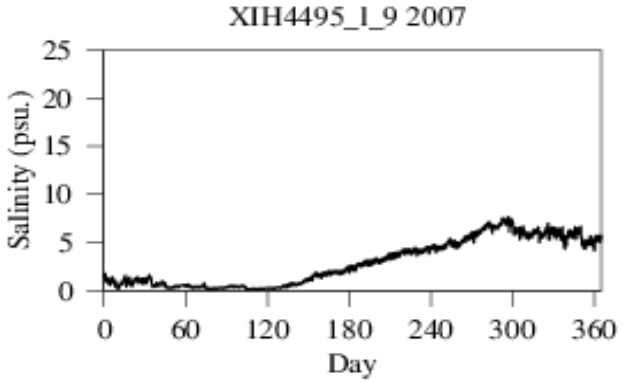
Surface S at XIH4495 (oligohaline)

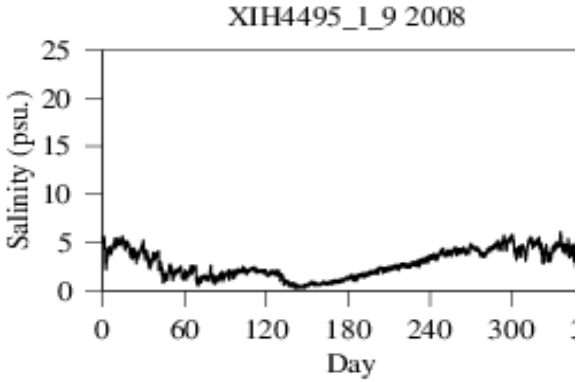


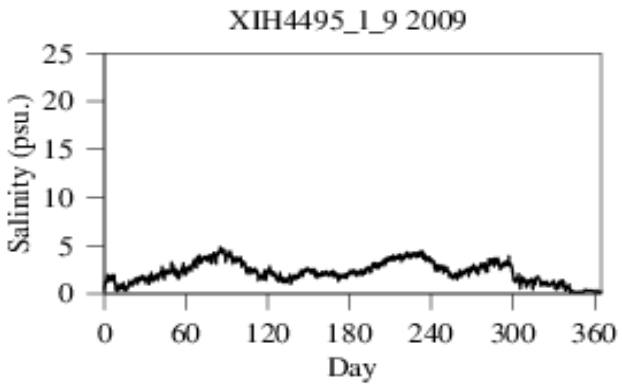


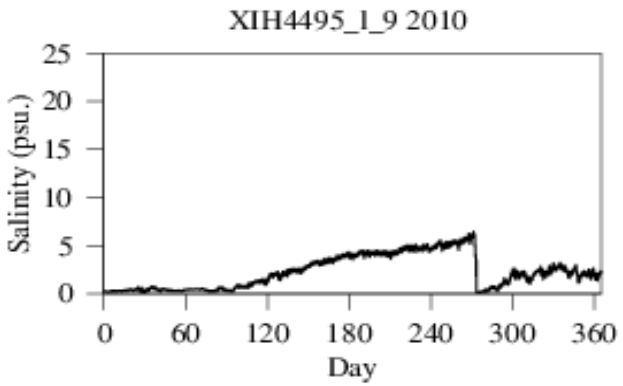


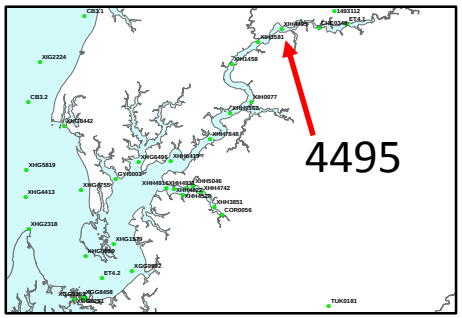




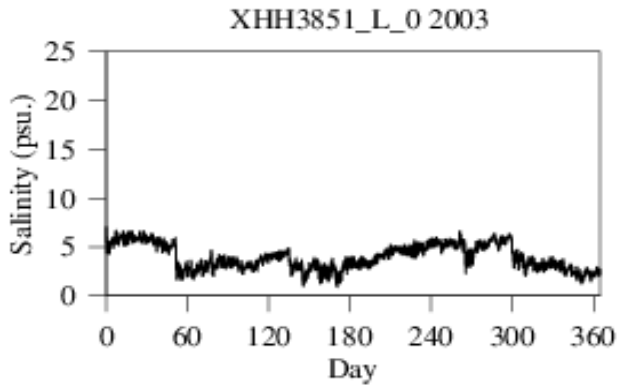


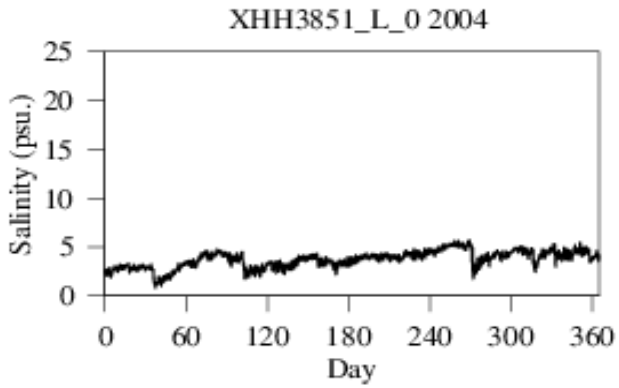


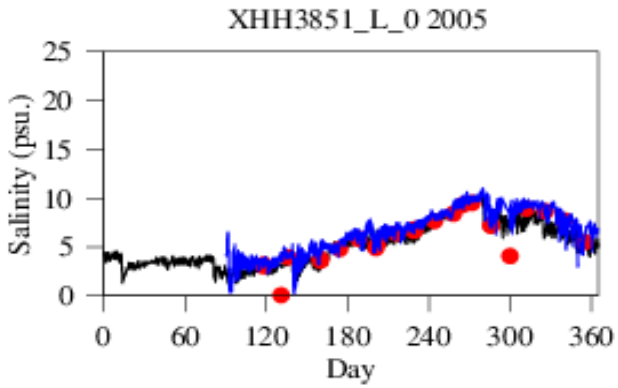


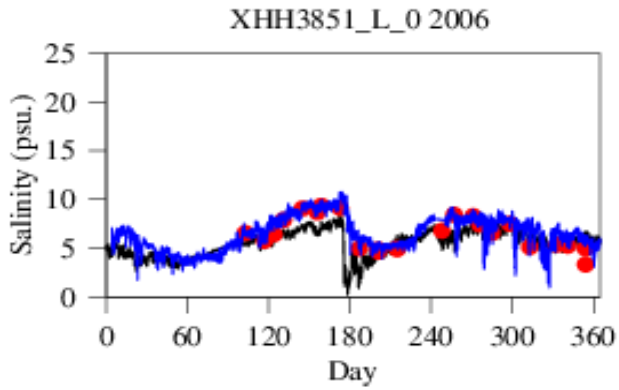


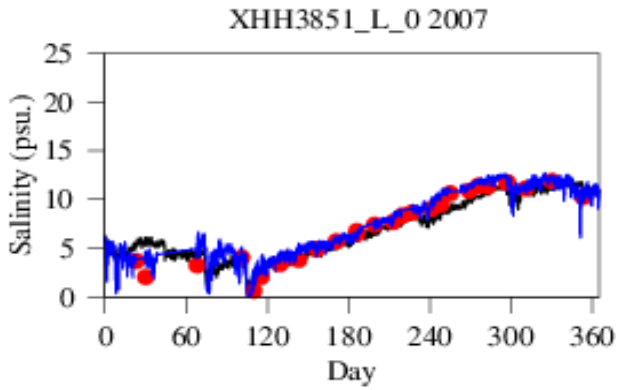
CMON S at XHH3851 (Corsica)

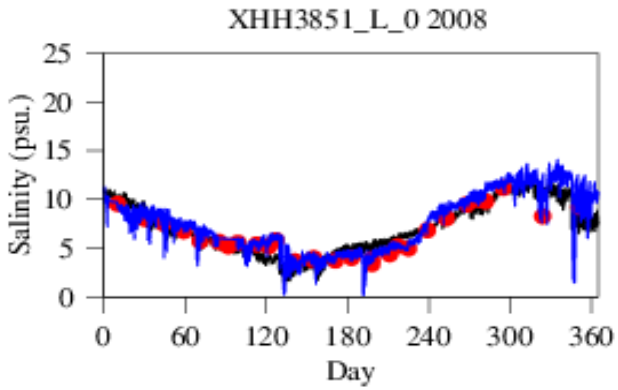


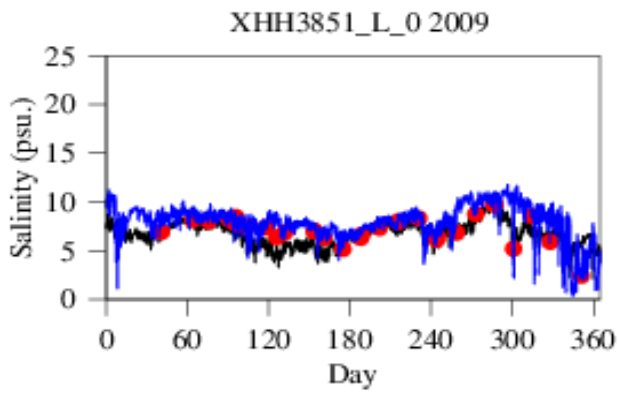


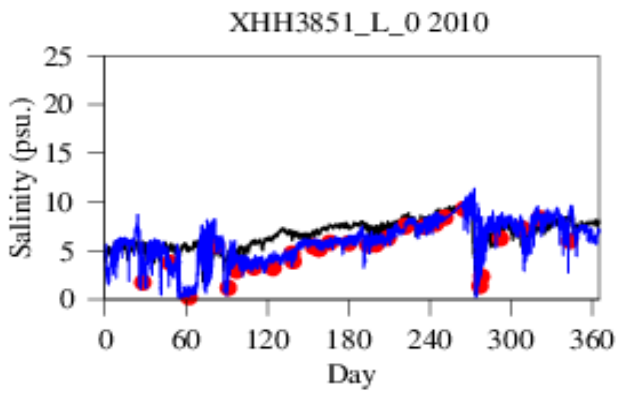


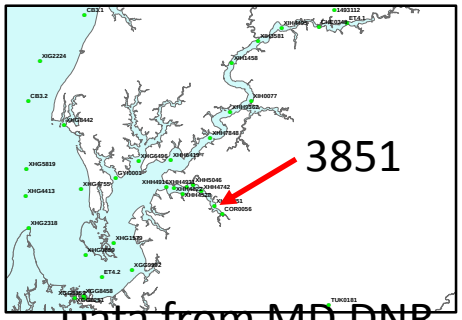






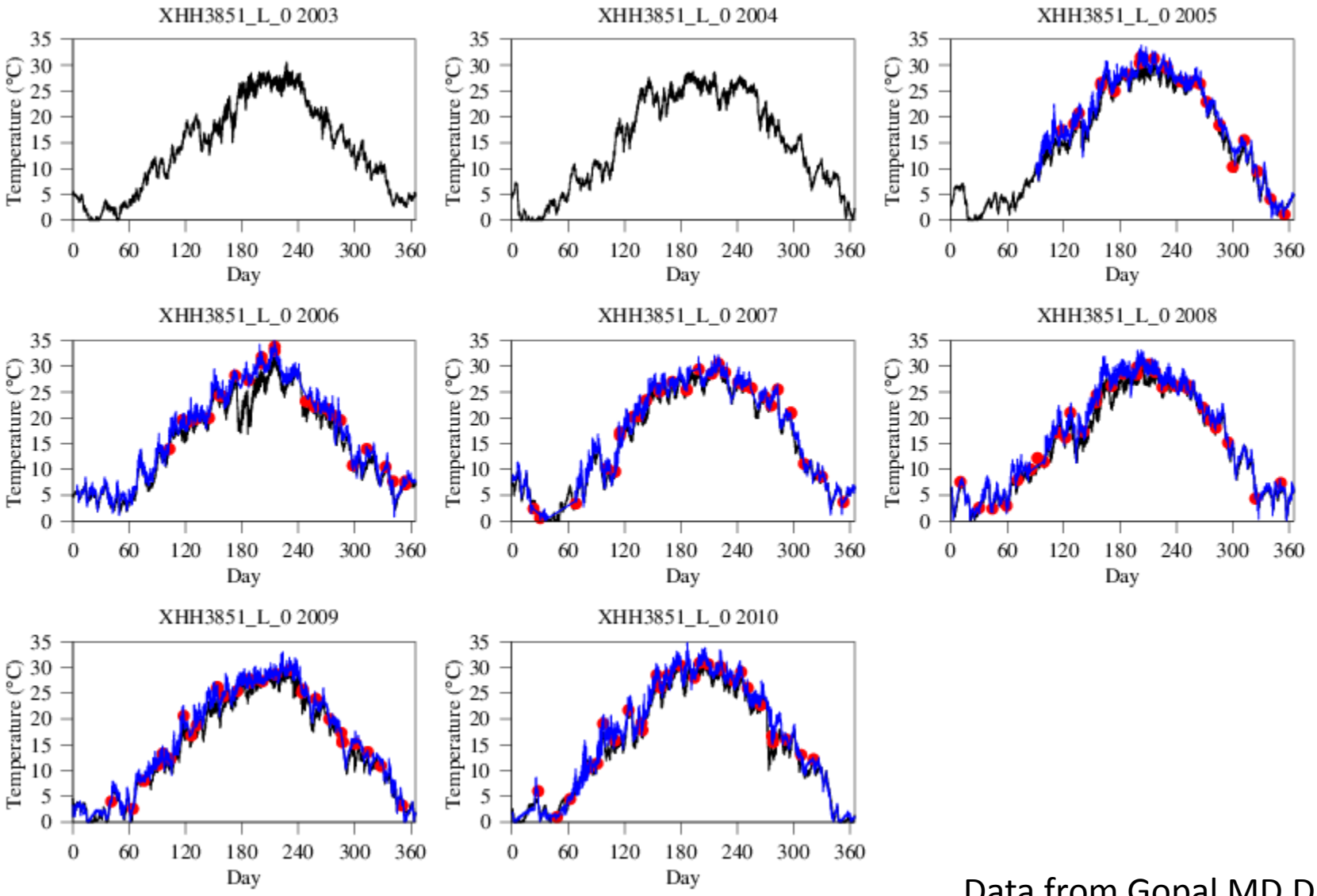






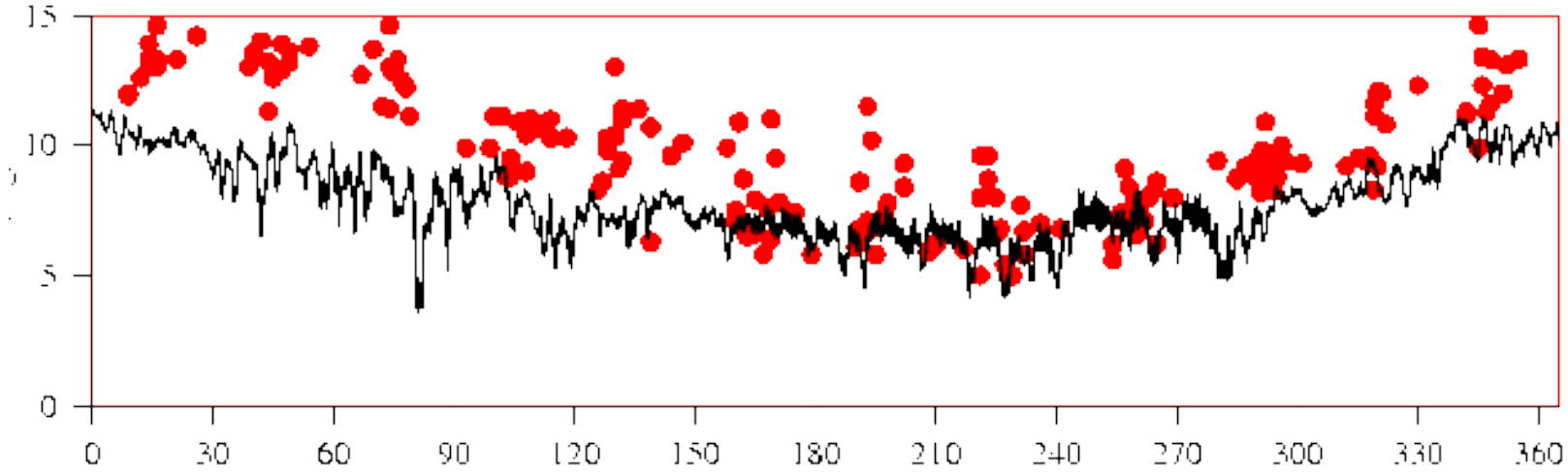
Data from MD DNR

CMON T at XHH3851 (Corsica)

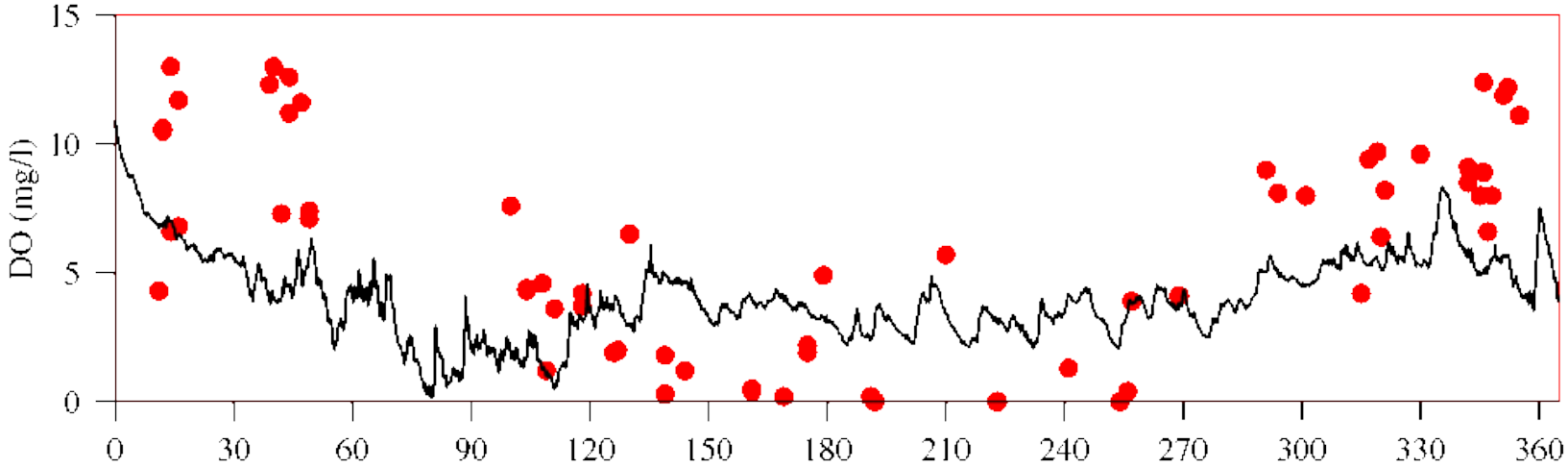


Data from Gopal MD DNR

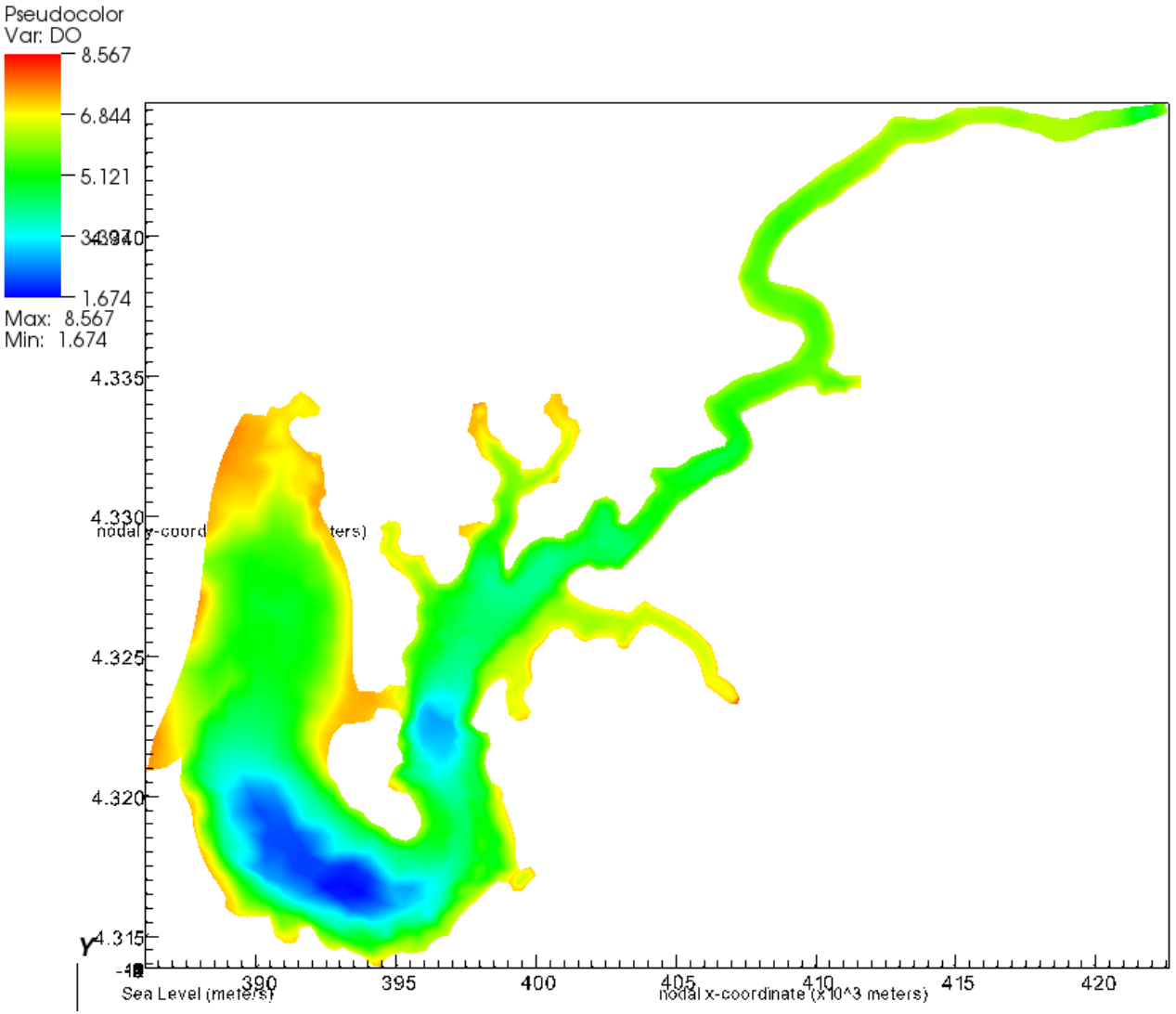
Surface DO at ET4.2



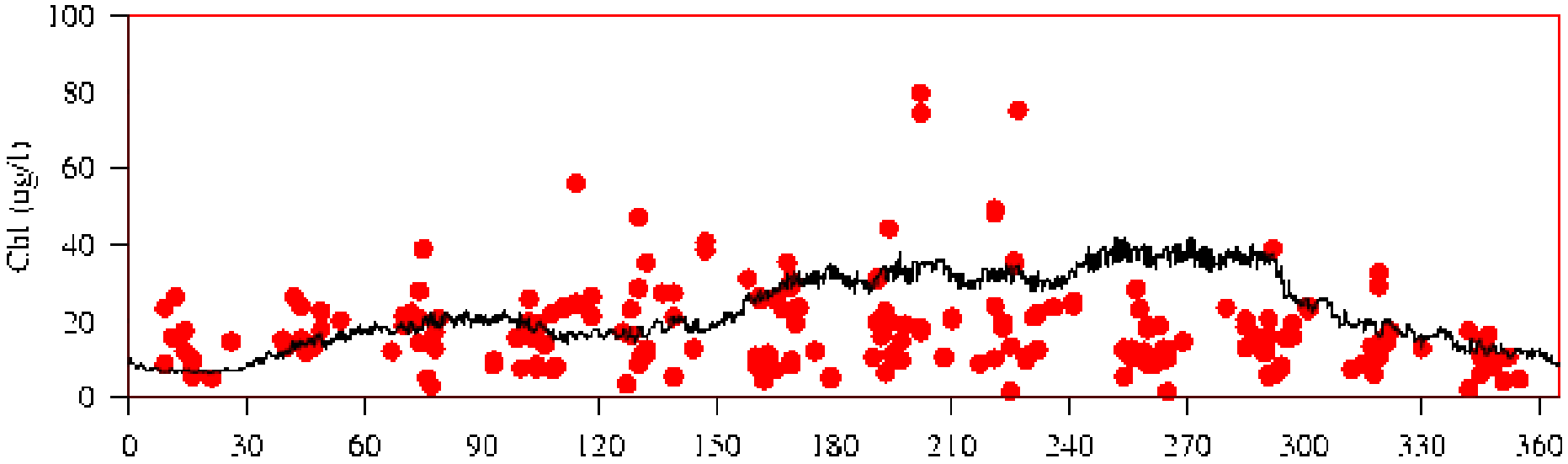
Bottom DO at ET4.2



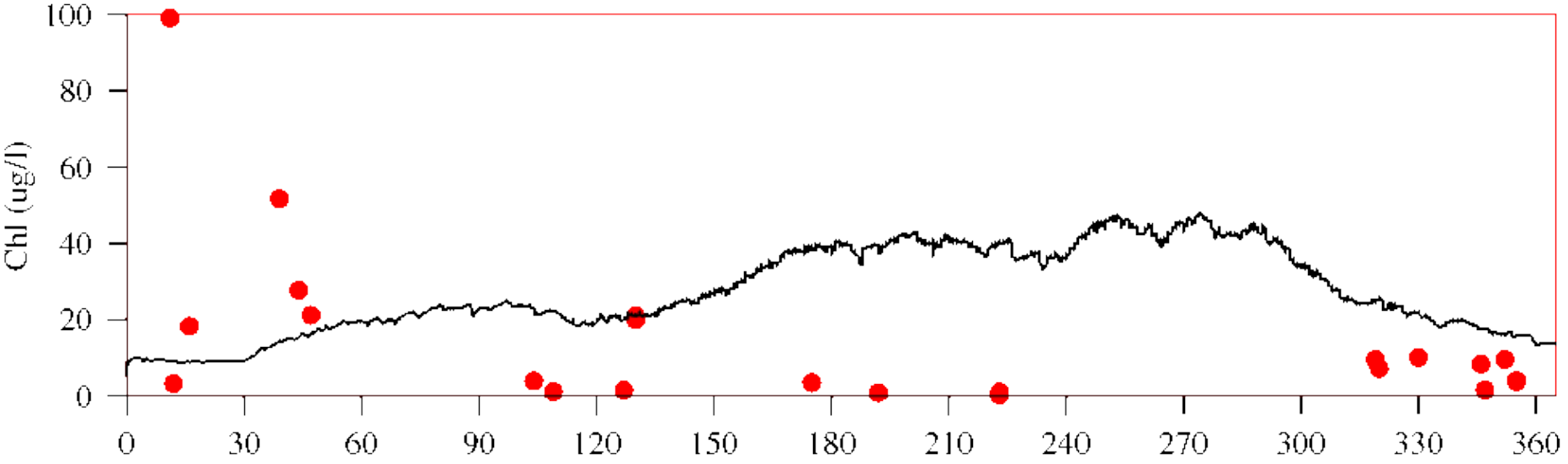
Bottom DO on July 4th



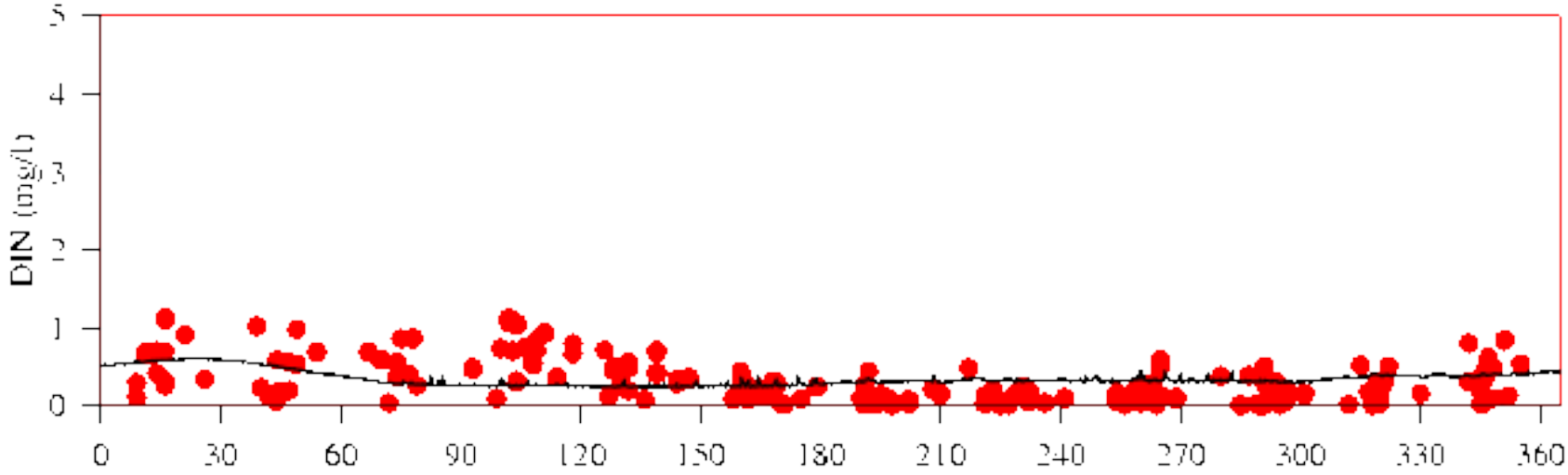
Surface Chl at ET4.2



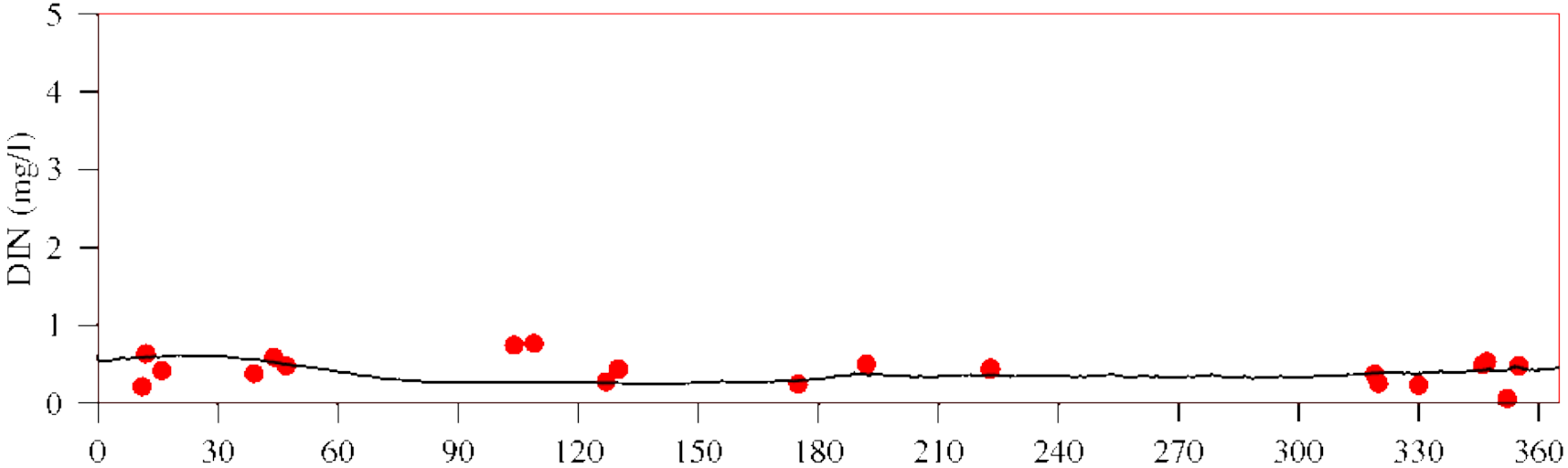
Bottom Chl at ET4.2



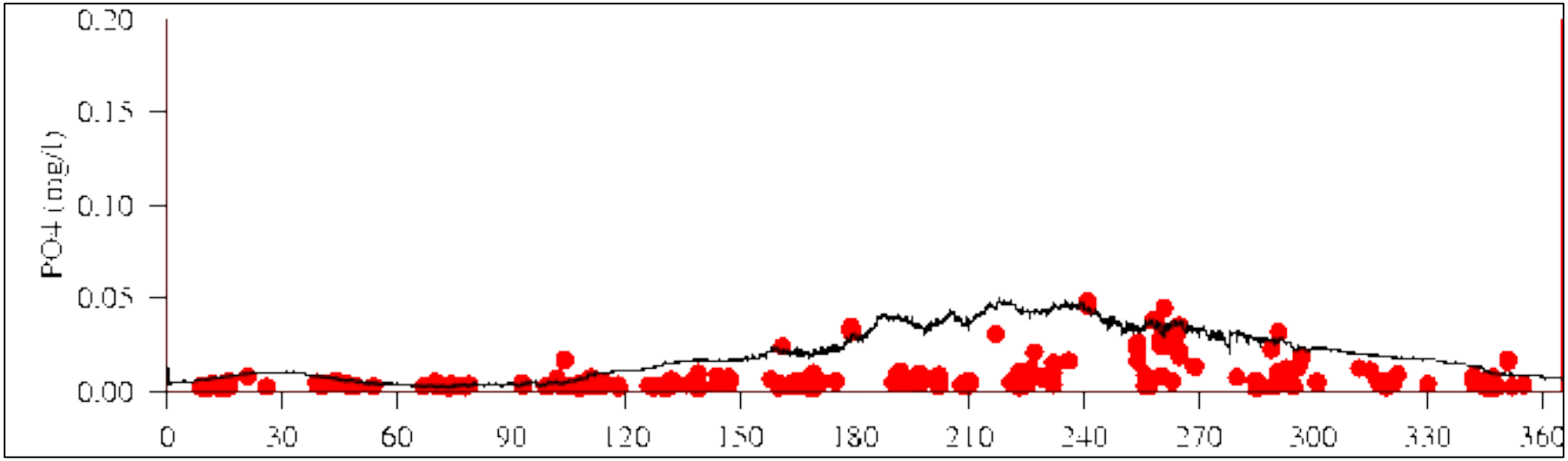
Surface DIN at ET4.2



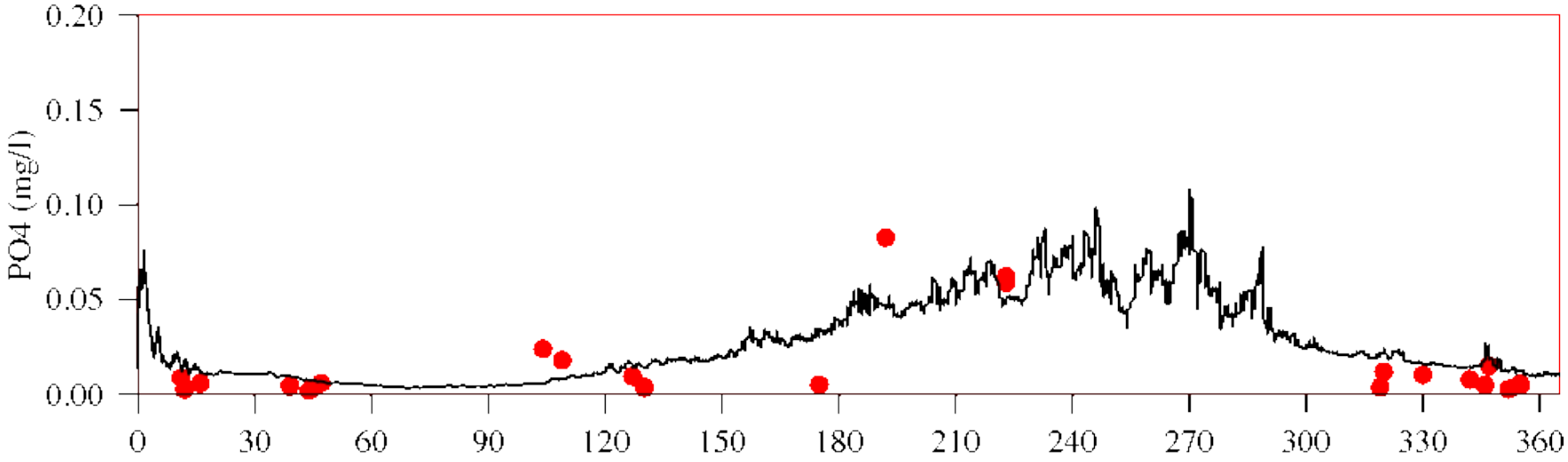
Bottom DIN at ET4.2



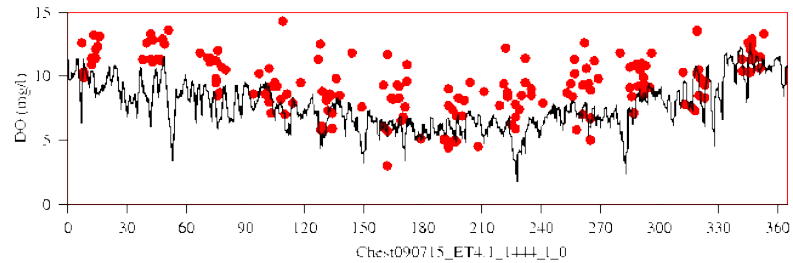
Surface PO4 at ET4.2

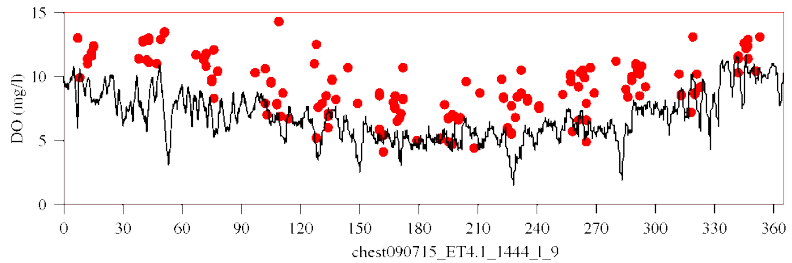


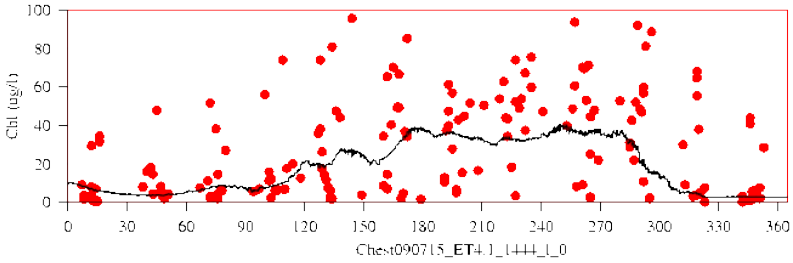
Bottom PO4 at ET4.2

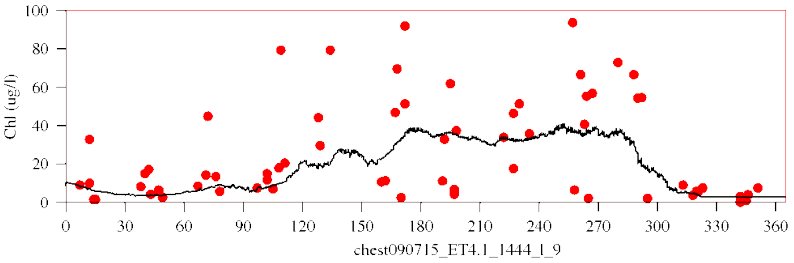


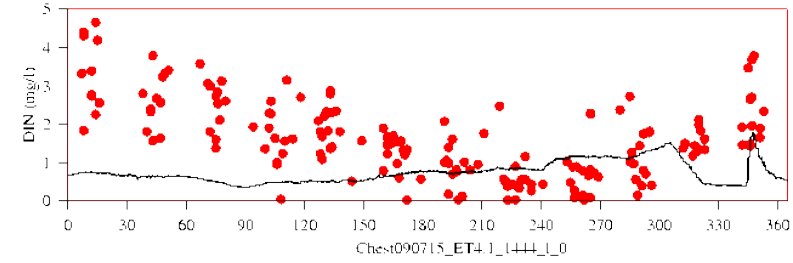
Simulation at ET4.1

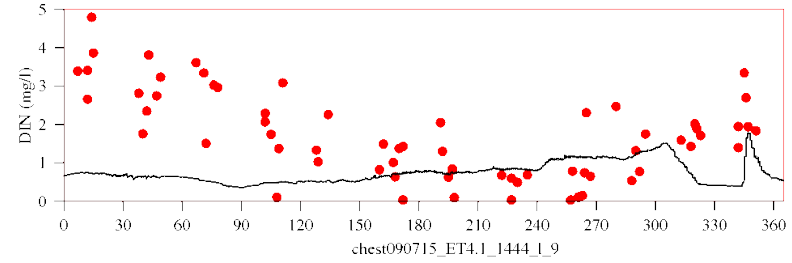


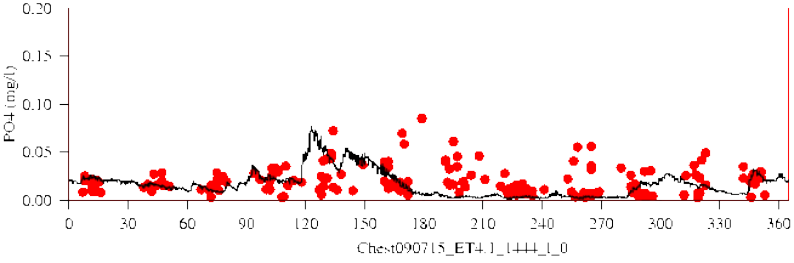


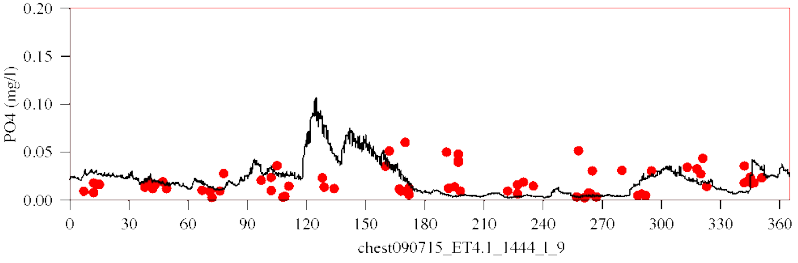


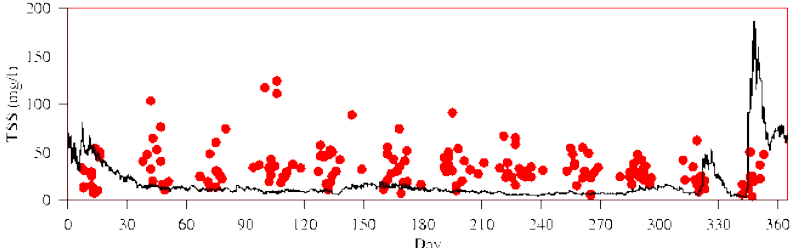


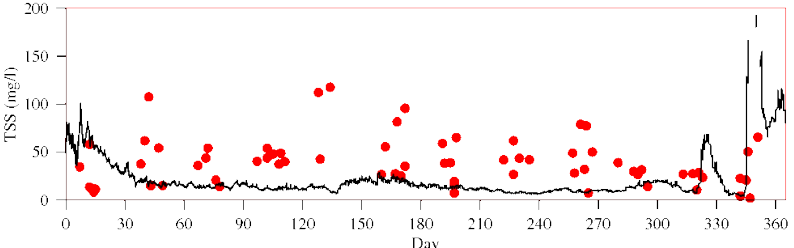












Message

- **Physical simulation seems OK, thanks to reasonable open boundary from CH3D and HSPF.**
- **Water quality simulation needs further calibration, spin up and multi-year simulation.**