Pelletier, Greg (ECY)

From: Robert Ambrose [bobambrosejr@gmail.com]
Sent: Monday, February 28, 2011 3:09 PM
To: Pelletier, Greg (ECY)
Cc: Ahmed, Anise (ECY); Sackmann, Brandon (ECY); Venkat Kolluru
Subject: Re: base 12 results
Attachments: base13.xls

Here is my analysis of base12, along with a base13 spreadsheet with 60 suggested runs. In this summary, I repeat observations made in earlier emails.

First, it looks to me like the temperature simulation is better, though I didn't formally compare with earlier series.

Second, the simulation has too much vertical mixing at SS08, which results in too much DO at depths K4 and KB. The observed vertical differences in salinity, temperature, and density are much more pronounced than the simulated. Is there any way to reduce vertical mixing here? Without doing that, I'm afraid that we will always get mid-depth and bottom DO concentrations that are too high.

With the cloud cover now, it is clear that GAM1 spring bloom is too late using Topt=12 or higher. Using Topt=11 (XPC06) improved the spring simulation nicely, though we could use just a little more spring productivity. For base13, I am recommending two alternate GAM1 parameter sets. Set 1a has Topt=10, Isat=30, and gmax=2.2. Set 1b has Topt=11, Isat=40, and gmax=2.4. I am recommending a full set of sensitivity runs with both of these bases.

The base12 simulations with anc=0.12 showed some advantages in reducing chl as well as DIN. Because it is unclear to me how this might work with GAM1a and GAM1b, I recommend that we examine this fully with GAM1c and GAM1d duplicating 1a and 1b, except for anc=0.12 rather than 0.10.

I'm recommending that GAM1 sensitivity runs look at gmax, ktg*, and Cchl. For base13 series, I'd keep the other GAM1 parameters constant (including w_s, k_R, k_D, K_n). We can investigate them for (hopefully) fine tuning in base14.

For GAM2, I recommend that we lower Topt to 17 and Isat to 70 to catch the late summer optimum conditions better. I also recommend ktg*=0.02 to get growth over a wider temperature regime. Finally, I recommend CChl be lowered slightly to 60 to get higher chl with lower productivity. GAM2 sensitivity runs should examine gmax, Isat, Topt, ktg*, and CChl. I'm recommending that the GAM2 base and sensitivity runs be conducted for each of the four GAM1 combinations. Doing that will show GAM2 sensitivity to anc.

The total number of simulations proposed here is 60. I hope we can get all these in, and that it casts a wide enough net to get the seasonal dynamics about right, so that base14 can start fine tuning.

I'll check my email's this evening for possible followup comments and questions.

Bob

On Mon, Feb 28, 2011 at 12:50 PM, Robert Ambrose <bobambrosejr@gmail.com> wrote:
Thanks, Greg. I'm about to take a lunch break, then get back finishing my examination.

Looking at SS08, it is clear that the simulation has too much vertical mixing, which results in too much DO at K4 and KB. The observed vertical differences in salinity, temperature, and density are much more pronounced than the simulated. Is there any way to reduce vertical mixing here? Without doing that, I'm afraid that we will always get mid-depth and bottom DO concentrations that are too high.

Bob

On Mon, Feb 28, 2011 at 12:35 PM, Pelletier, Greg (ECY) <gpel461@ecy.wa.gov> wrote:

Bob,

Below is a ranking of the goodness of fit for the base 12 runs. It looks like XPC6 was the best run as you noted earlier.

Many of the runs with anc=12 also were among the lowest RMSE, although those runs did not have distinct/separate spring and fall phytoplankton groups.

Station	Station average	Station-depth average
Variable	Wtd-avg RMSE	Wtd-avg RMSE
base12_XPC06_G1Tm11_subset_rmse	0.44	0.44
base12_XPB09_anc12_G1gmax26_G2gmax28_subset_rmse	0.46	0.46
base12_XPJ11_anc12_G1gmax24Isat30_subset_rmse	0.46	0.47
base12_XPJ13_anc12_G1gmax26_subset_rmse	0.46	0.47
base12_XPJ15_anc12_G1gmax26Isat50_subset_rmse	0.47	0.48
base12_XPJ14_anc12_G1gmax26Isat30_subset_rmse	0.47	0.47
base12_XPB10_anc12_G1gmax28_G2gmax30_subset_rmse	0.48	0.47
base12_XPJ10_anc12_G1gmax24_subset_rmse	0.48	0.48
base12_XPC03_G1gmax26_subset_rmse	0.50	0.49
base12_XPC12_Ssol119_subset_rmse	0.50	0.49
base12_XPJ08_G1gmax24Isat30_subset_rmse	0.50	0.50
base12_XPC02_G1gmax24_subset_rmse	0.52	0.51
base12_XPJ12_anc12_G1gmax24Isat50_subset_rmse	0.52	0.50
base12_XPC04_G1Isat30_subset_rmse	0.54	0.52
base12_XPB05_anc12_G2gmax28Isat100_subset_rmse	0.55	0.52
base12_XPB08_anc12_G2gmax30Isat100_subset_rmse	0.55	0.52
base12_XPB03_anc12_G2gmax28_subset_rmse	0.55	0.52
base12_XPB04_anc12_G2gmax28Isat70_subset_rmse	0.55	0.52
base12_XPB06_anc12_G2gmax30_subset_rmse	0.55	0.52
base12_XPB07_anc12_G2gmax30Isat70_subset_rmse	0.55	0.52
base12_XPJ09_G1gmax24Isat50_subset_rmse	0.55	0.52
base12_XPJ01_G1kd02_subset_rmse	0.55	0.52
base12_XPC08_G1ws4_subset_rmse	0.56	0.52
base12_XPC10_G1kr06_subset_rmse	0.56	0.53

base12_XPI18_WzeroRhalf_subset_rmse	0.56	0.53
base12_XPJ07_G1ktg204_subset_rmse	0.57	0.53
base12_XPI03_G2Tm19_subset_rmse	0.57	0.53
base12_XPB11_G2gmax223CCh60_subset_rmse	0.57	0.53
base12_XPI16_G2gmax2CCh50_subset_rmse	0.57	0.53
base12_XPI12_G2ktg103_subset_rmse	0.57	0.53
base12_XPI01_G2Isat100_subset_rmse	0.57	0.53
base12_XPI05_G2ws3_subset_rmse	0.57	0.53
base12_XPI09_G2kd04_subset_rmse	0.57	0.53
base12_XPI15_G2CCh50_subset_rmse	0.57	0.53
base12_XPI07_G2kr08_subset_rmse	0.57	0.53
base12_XPB02_G2gmax28Isat100_subset_rmse	0.57	0.53
base12_XPI14_G2CCh60_subset_rmse	0.57	0.53
base12_XPI11_G2kn30_subset_rmse	0.57	0.53
base12_XPJ04_G1kn26_subset_rmse	0.57	0.53
base12_XPC01_subset_rmse	0.57	0.53
base12_XPI13_G2ktg203_subset_rmse	0.57	0.53
base12_XPJ03_G1kn22_subset_rmse	0.57	0.53
base12_XPI10_G2kn26_subset_rmse	0.57	0.53
base12_XPI06_G2kr06_subset_rmse	0.58	0.54
base12_XPI08_G2kd02_subset_rmse	0.58	0.53
base12_XPJ18_G2Isat70_subset_rmse	0.58	0.53
base12_XPI04_G2ws1_subset_rmse	0.58	0.53
base12_XPJ16_G2gmax28_subset_rmse	0.58	0.54
base12_XPJ06_G1ktg2024_subset_rmse	0.58	0.54
base12_XPB01_G2gmax28Isat70_subset_rmse	0.58	0.53
base12_XPJ17_G2gmax30_subset_rmse	0.58	0.54
base12_XPC11_G1kr08_subset_rmse	0.58	0.54
base12_XPI02_G2Tm17_subset_rmse	0.58	0.54
base12_XPC09_G1ws6_subset_rmse	0.58	0.55
base12_XPJ02_G1kd04_subset_rmse	0.58	0.55
base12_XPC05_G1Isat50_subset_rmse	0.59	0.55
base12_XPI17_W2R2_subset_rmse	0.59	0.55
base12_XPJ05_G1ktg103_subset_rmse	0.60	0.56
base12_XPC07_G1Tm13_subset_rmse	0.63	0.58

Greg

Greg Pelletier
Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600
voice: 360.407.6485
fax: 360.407.6884
email: greg.pelletier@ecy.wa.gov

From: Robert Ambrose [mailto:bobambrosejr@gmail.com]

Sent: Monday, February 28, 2011 9:07 AM
To: Pelletier, Greg (ECY)
Subject: Re: base 12 results

Yes, Greg. I'm concentrating on GAM2 parameters right now, and will make summary observations later this afternoon. I believe the recommendations can follow quickly.

Bob

On Mon, Feb 28, 2011 at 11:57 AM, Pelletier, Greg (ECY) <gpel461@ecy.wa.gov> wrote:

P.S. is there a chance you could send us your comments and spreadsheet
of recommendations for sensitivity for base 13 by end of the day today
or tomorrow?

-----Original Message-----
From: Pelletier, Greg (ECY)
Sent: Friday, February 25, 2011 3:15 PM
To: Robert Ambrose
Cc: Ahmed, Anise (ECY); Sackmann, Brandon (ECY); Venkat Kolluru

Subject: RE: base 12 results

All of the base 12 time series charts from all runs including the runs
on XPC are now online:

https://fortress.wa.gov/ecy/spsdos/index.html

-----Original Message-----
From: Robert Ambrose [mailto:bobambrosejr@gmail.com]
Sent: Fri 2/25/2011 1:45 PM
To: Pelletier, Greg (ECY)
Cc: Ahmed, Anise (ECY); Sackmann, Brandon (ECY); Venkat Kolluru
Subject: Re: base 12 results

Greg, I've taken a couple of hours and looked at a few runs. Base12
hasn't
been available, so I used XPJ16 to stand in for the base (GAM2 gmax=2.8
rather than 2.6). Here are my impressions so far.

First, it looks to me like the temperature simulation is better, though
I

didn't formally compare with earlier series. That is encouraging to me, even
if this is a subjective impression.

Second, it is clear that GAM1 spring bloom is too late using Topt=12 or
higher. Using Topt=11 (XPC06) improves the spring simulation nicely, though
we could use just a little more spring productivity I believe. Presently I'm
leaning to a recommendation of GAM1 Topt=11 for base13, with sensitivity of
10 and 12, and ktg1=0.03 either in the base or as a sensitivity. So I'm
encouraged by XPC06, and think that tweaks of this run will give us a good
calibration.

When we raise GAM1 gmax to 2.4 and lower Isat to 30 (with Topt=12), we do
get spring productivity better than base12, but not as nicely as for
Topt=11. Also, the summer/fall seasonality doesn't look as good to me. With
gmax of 2.4 and Isat of 50, the spring bloom is delayed too much.

I'll look at different combinations to gain more insights, but I do believe
we'll have to be moving to GAM1 Topt=11 (or even 10) as a better base. With
the present base, the way late spring is affecting summer and fall.
Consequently, reading too much into the sensitivity runs may not help us
much for the next set of runs.

I am leaving early Saturday for a reunion weekend at Davidson. I'll be back
Sunday night, and take a fresh look at these runs again Monday morning. If
you have some thoughts looking at the runs, please run them by me. It would
likely help me use my hours more productively.

Bob

On Thu, Feb 24, 2011 at 1:18 AM, Pelletier, Greg (ECY)
<gpel461@ecy.wa.gov>wrote:

> Bob,
>
> The base 12 time-series charts for all runs except those running on XPC are
> uploaded. I'll upload the XPC runs later this week after they finish.

>
> https://fortress.wa.gov/ecy/spsdos/index.html
>
> Greg
>
>