Pelletier, Greg (ECY)

From: Robert Ambrose [bobambrosejr@gmail.com]
Sent: Thursday, June 30, 2011 3:54 PM
To: Pelletier, Greg (ECY)
Subject: Re: base 17 time outputs are online
Attachments: base18.xls

Greg, here is my base18 spreadsheet with recommended sensitivity runs.

For this series, I spent 7.5 hrs; my total cumulative is 53.25 hrs, with 22.75 hrs remaining. This should be enough for 3 more calibration/sensitivity rounds.

Bob

On Thu, Jun 30, 2011 at 3:45 PM, Robert Ambrose <bobambrosejr@gmail.com> wrote:

Greg, I've pretty much finished looking over the simulation plots. As I mentioned in an earlier email, the increased shading did not accomplish what I was hoping. Using the sensitivity runs, however, we might be able to work with this further. So I'm proposing that the next series include separate base runs with the base17 shading and the base16 shading.

Looking over the plots, I have difficulty seeing how the anc=0.12 gives better RMSE than anc=0.10. When I compared not only the base runs (XPB01 against XPC01), but also key sensitivity variations (e.g., XPB02 against XPC02), the anc=0.10 plots and stats were usually better for chl and DO.

Nevertheless, I'm recommending that we keep both anc values as separate base runs for the next series. This will give us four base variations that we can compare, and thus a wider net, though with less sensitivity variations. In the base17 runs, there were several parameters that showed little sensitivity, including k_R, k_D, K_n, GAM2 w_s.

Here is my proposed table. Note for the higher shading base runs I've recommended higher gmax, lower k_D, lower GAM1 w_s, and lower shallow GAM1 k_R. For both I'm recommending a lower GAM2 Topt.

I'll be working up a set of sensitivity runs to go with these proposed base runs. As always, I'm open for feedback, and feel free to tweak these as you see fit.

Bob

	Simulation Series				Simulation Series			
Parameters	18a		18b		18c		18d	
	shallow	deep	shallow	deep	shallow	deep	shallow	deep
General								
anc	0.10		0.12		0.10		0.12	
Ke_b	0.045		0.045		0.0365		0.0365	
Ke_c	0.070		0.070		0.640		0.640	
SOD	1.5x		1.5x		1.5x		1.5x	
GAM1								
gmax	2.5	2.3	2.5	2.3	2.4	2.2	2.4	2.2
Isat	40	30	40	30	40	30	40	30

Topt	11	10	11	10	11	10	11	10
ktg1	0.020	0.020	0.020	0.020	0.024	0.024	0.024	0.024
ktg2	0.020	0.020	0.020	0.020	0.024	0.024	0.024	0.024
cchl	60	60	60	60	60	60	60	60
k_n	24	24	24	24	24	24	24	24
k_R	0.07	0.07	0.07	0.07	0.08	0.07	0.08	0.07
k_D	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03
w_s	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5
GAM2								
gmax	2.5	2.6	2.5	2.6	2.4	2.5	2.4	2.5
Isat	70	70	70	70	70	70	70	70
Topt	16	15	16	15	16	15	16	15
ktg1	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020
ktg2	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020
cchl	50	50	50	50	50	50	50	50
k_n	28	28	28	28	28	28	28	28
k_R	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
k_D	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03
w_s	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

On Wed, Jun 29, 2011 at 12:04 PM, Robert Ambrose <bobambrosejr@gmail.com> wrote:
Hi, Greg. I'm back working this morning at a local coffee shop, as my cable internet has been down for the past day or so. I have to go back home for a couple of hours now.

So far it seems to me that the increased shading coefficients did not have quite the effects I was hoping for, balancing top and bottom chl and DO better. The higher coefficients did suppress productivity as expected, but the slightly increased gmax did not adequately compensate and keep surface chl levels high enough. Meanwhile, bottom productivity was still a bit too high. So it seems to me now that we'll need to increase SOD to get bottom DO down.

Lowering GAM1 ktg1 and ktg2 to 0.02 improved spring chl and DO somewhat, and so we should use the lower values in future runs. Lowering GAM2 ktg1 and ktg2 had only minor effects, so we should keep that at 0.2.

Varying GAM1 and GAM2 cchl produced mixed effects across stations and variables. It seems best to keep those at 60 and 50, respectively.

Lowering GAM1 w_s from 0.5 to 0.4 helped early spring chl, and so we should keep the lower value for future runs and explore sensitivity of even lower w_s. Altering GAM2 w_s had only minor effect, so we should keep that at 0.2.

More later...

Bob

On Mon, Jun 27, 2011 at 9:44 PM, Robert Ambrose <bobambrosejr@gmail.com> wrote:
Greg, I had compared base17a and base17b, and thought that the former was a bit better as a base. But then I noticed that all of the top 10 RMSE stations were variations of base17b. I took the top one, XPB13, and compared it with 17a and 17b for the six stations with plots. Looking mainly at chl and DO, it is difficult for me to see why XPB13 would be best. For these variables at the representative shallow station (SSO8), base17a was better statistically at KT and K4, whereas XPB13 was best at KB. For the five deep water stations, base17a

seemed best at SS52, SS66, and NSEX01; base17b seemed best at SS71 and tied with XPB13 at KSPB01. All in all, for these six stations, I would have picked base17a.

What I plan to do tomorrow morning is to go over the base17a sensitivity variations, looking for patterns and how to improve the parameters. Right now I'm thinking we need to pick up the shallow water productivity in August-September, perhaps by lowering GAM2(shallow) Topt from 17 to 16. It looks like we'll need more summer-fall productivity in deep stations, which we might get by lowering GAM2(deep) Topt from 17 to 15.

Perhaps other modifications will suggest themselves tomorrow.

Bob

On Mon, Jun 27, 2011 at 5:33 PM, Pelletier, Greg (ECY) <gpel461@ecy.wa.gov> wrote:

Bob,

Good luck with your procedure tomorrow. Thanks for the feedback on the SOD – your proposal sounds good to me.

The RMSE stats are now online. Here are the top 10 model runs based on RMSE

base17b_XPB13

base17b_XPI14

base17b_XPI10

base17b_XPB12

base17b_XPI06

base17b_XPI18

base17b_XPI11

base17b_XPI15

base17b_XPI03

base17b_XPB01

Greg

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From: Robert Ambrose [mailto:bobambrosejr@gmail.com]
Sent: Monday, June 27, 2011 12:37 PM
To: Pelletier, Greg (ECY)
Subject: Re: base 17 time outputs are online

Greg, I'll start looking at these runs later this afternoon and evening, as well as tomorrow morning. I have a prostate biopsy tomorrow afternoon, so will be out of commission for at least a half-day or so.

Regarding SOD, I believe we would be justified calibrating the flux within the observed range, though I'd keep well within the max/min (especially those with a positive sign). Hopefully the increased self-shading in the present runs will lower DO production with depth and not require too much SOD calibration. In any case, it would be worthwhile doing SOD sensitivity in the next iteration, perhaps +/- 50% of the averages that have been used.

Bob

On Mon, Jun 27, 2011 at 2:15 PM, Pelletier, Greg (ECY) <gpel461@ecy.wa.gov> wrote:

Bob,

The output charts (time series and depth-time) for base 17 are now online. The RMSE stats will be added later this week.

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

For the next base 18, I am thinking it would be good to try increasing the SOD in the shallow inlets to improve the bottom DO predictions. What do you think about that and what kind of increases in SOD do you think would be reasonable? The attached file shows a map and list of the sediment flux rates currently being used in different regions (all units are g/m^2/day). The file “forRochelle” shows the averages and ranges of observed sediment flux data. We were thinking we could adjust the sediment fluxes to the max/min of the observed range as needed for calibration. What do you think?

Greg

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