

Pelletier, Greg (ECY)

From: Robert Ambrose [bobambrosejr@gmail.com]
Sent: Friday, November 19, 2010 8:43 AM
To: Pelletier, Greg (ECY)
Cc: Ahmed, Anise (ECY); Sackmann, Brandon (ECY); Goldsmith, David
Subject: Re: base 6 output charts on FTP site

Greg, I looked at a few more sensitivity runs this morning, including those increasing K_n from base 7 ug/L to 14 and 28, one increasing base anc from 0.1 to 0.176, and one increasing Isat from 100 to 150.

Increasing K_n from 7 to 14 had no discernible effect at any station. Increasing it to 28 ug/L shifted the spring bloom very slightly later and smaller (so not quite as good as base). DIN (including NH_4 and NO_3) increased slightly in the summer, which was a bit better than base.

Increasing anc from 0.1 to 0.176 lowered phytoplankton production, including chl_a, summer DO, and summer CBOD. The resulting chl_a became too low, except at stations SBS66 and KSPB, where both chl_a and DO were better. Generally, anc 0.176 made surface DO worse but subsurface DO better, and made CBOD better most everywhere.

Increasing Isat from 100 to 150 caused a later spring bloom. Because of this, chl_a was not quite as good as base.

It looks like we need at least one phytoplankton group to have better spring performance, with Isat of 75 and Topt of 13. It also looks like phytoplankton production is hurting DO and CBOD simulation.

Bob

On Thu, Nov 18, 2010 at 5:08 PM, Robert Ambrose <bobambrosejr@gmail.com> wrote:

Greg, so far I've examined the Base6 plots, as well as plots for GAM2Tm3 (group 2 Topt = 13) and Isat3 (group 1&2 Isat = 75). My examination will go a bit faster now, but I won't have time to do more today. So I wanted to pass along observations to this point.

Chlorophyll a

For the base run, chl a looks fair to good. Of course some stations are very good, particularly in the summer. It looks like there is a systematic underestimate of chl a from Jan - March/early April, when the simulated spring bloom takes off. Data in SPS show chl a during this period of 2 - 30 ug/L, mostly lower but not usually 0. I wonder if the ICs for chl a were set to 0? If so, it seems to me that ICs of 2 - 5 ug/L for the winter/spring assemblage would help.

The GAM2Tm3 run is similar to the base, but the dominant group has switched from GAM1 to GAM2 and the spring bloom occurs a few weeks earlier, giving better (and higher) spring chl a. This run looks like an improvement over base.

The Isat3 run is also similar to base, with the same dominant group 1 as base. With lower Isat, the spring bloom occurs slightly earlier, giving slightly better spring chl a.

From these runs, I believe that we need to parameterize a winter-spring assemblage and a summer-fall assemblage. I'd set GAM1 with Topt=13 and Isat=75, and have GAM2 use $\theta_G=1.057$ and Isat=100. I would set ICs for GAM1 = 2 to 5 ug/L.

CBOD

Simulated CBOD shows a pronounced seasonal trend, dropping to around 1 in winter and rising to 3-5 in the summer. The observed data, however, hover persistently around 2 spatially and temporally. One way to get a better simulated CBOD pattern would be to decrease decay in winter and increase decay in the summer. This could be accomplished by increasing CBOD fast and slow theta from the conventional 1.047 to 1.06, or perhaps even 1.08. I don't know if this alone would even out the simulated seasonal fluctuation, but it would be worth a couple of sensitivity runs, I think. I wonder if setting the phytoplankton ratio to fast CBOD higher than 0.5 would help, as it seems that the spring-summer productivity is adding too much CBOD, and allowing some of that to decay more rapidly with CBOD_f might help.

DO

The DO simulations seem pretty good, mostly. The simulations tend to be higher than observations, however, in late summer and early fall. I wonder if the CBOD tweaks above might help the summer/fall DO.

DIN

The DIN simulations seem pretty good, also. They tend to be a little lower than observations in late summer and fall. I'm not sure at present what to suggest for that. I'll need to look over more sensitivity runs to learn more.

That's it for now.

Bob

On Wed, Nov 17, 2010 at 7:13 PM, Pelletier, Greg (ECY) <gpel461@ecy.wa.gov> wrote:

Output charts for 20 of the 50+ model runs from base 6 have been uploaded to our FTP site:

<ftp://www.ecy.wa.gov/eap/sps/index.html>

The 20 runs that are uploaded are runs 1-10 from servers xpb and xpc (see last two columns in the index_base6.pdf table for base 6 to identify which runs these are).

The remaining 30+ model runs for base 6 will be added probably tomorrow after they charts are finished.

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