

## Pelletier, Greg (ECY)

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**From:** Robert Ambrose [bobambrosejr@gmail.com]  
**Sent:** Monday, January 24, 2011 4:03 PM  
**To:** Pelletier, Greg (ECY)  
**Cc:** Ahmed, Anise (ECY); Sackmann, Brandon (ECY); Edward Buchak  
**Subject:** Re: Analysis of base10 runs and recommendations for base11  
**Attachments:** base11.xls

OK, I've modified my recommendations a little based on the universal anc requirement. Attached is a spreadsheet with proposed sensitivity runs for base11.

Bob

On Mon, Jan 24, 2011 at 5:18 PM, Ahmed, Anise (ECY) <[AAHM461@ecy.wa.gov](mailto:AAHM461@ecy.wa.gov)> wrote:

Hi Bob,

The **anc** can be changed globally only and not for individual algal groups. So, we can run base11 for anc of 0.12 (base), 0.1 and 0.14

Thanks

*Anise Ahmed*

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**From:** Robert Ambrose [mailto:[bobambrosejr@gmail.com](mailto:bobambrosejr@gmail.com)]  
**Sent:** Monday, January 24, 2011 1:58 PM  
**To:** Pelletier, Greg (ECY)  
**Cc:** Ahmed, Anise (ECY); Sackmann, Brandon (ECY); Edward Buchak  
**Subject:** Analysis of base10 runs and recommendations for base11

Greg and colleagues,

I've been through most of the runs, and offer the following comments in preparation for the next round, base11. I've attached a base11 sensitivity spreadsheet that is partly filled in. Later this afternoon I will send an updated spreadsheet, and add a few more analysis comments. Meanwhile, please share your reactions to these recommendations, and we can iterate together to the next set.

I had already noted that XPC02 (GAM1 kfg=0.03) helping the patterns some. My thought there for GAM1 was to keep kfg1 = 0.024 for T lower than Topt and raise kfg2 to 0.04 for T higher than Topt.

It looked to me like raising GAM1&2 Kn from 28 to 32 (XPC07) had minimal effect, decreasing productivity slightly, and raising NH4 concentrations, which were already too high. Lowering GAM1&2 Kn to 14 (XPC04) had some benefits. This increased productivity year round, with mixed benefits and costs. NH4 was always lower (better), but chl and DO improvements or declines depended on station and season. My thought was to match lower Kn for GAM1 with slightly higher k\_D, keeping Kn for GAM2 at 28.

Based on an analysis of base10a and the associated sensitivity runs, my recommendation for base11 phytoplankton constants is given in the following table:

Parameter	GAM1	GAM2
gmax	<b>2.2</b>	<b>2.6</b>
Isat	<b>60</b>	<b>120</b>
Topt	<b>12</b>	<b>18</b>
w_s	<b>0.5</b>	<b>0.2</b>
kgt1	0.024	0.024
kgt2	0.04	0.024
anc	0.12	0.12
Kn	22	28
k_R	0.06	0.06
k_D	0.04	0.04

Values that are bolded would be “locked in” for now, and not investigated in these sensitivity runs.

For base11, we should consider increasing the nitrification rate constant from 0.07 to 0.10 to get closer to the observations, which generally had lower NH4 and higher NO3 than base10 predictions. Also, it would be good if we could adjust a mixing parameter to get less vertical transport between the surface and 4 meters depth. This should especially help the salinity, temperature, and oxygen dynamics in shallow areas like SS08.

For the sensitivity runs, I recommend the strategy this time of varying the phytoplankton groups separately, so we can more easily fine tune the seasonal response. For roughly half of the sensitivity runs we should hold GAM2 constants to the base values and vary GAM1 constants individually or in select combinations to fine-tune the spring and early summer dynamics. Then we should hold GAM1 constants to the base and vary GAM2 constants to fine tune the late summer-fall-winter dynamics. I've started the spreadsheet with individual parameter variations. We should also try out judicious parameter combinations. I'll work on that a little later.

Bob

p.s., I have now exhausted my assigned Task 2 hours. I'll finish up this round with you as part of my personal "tech assistance" interests.