Settling

New input parameter: ISINK_OUT

Integer, acts as boolean. 1==yes it sinks out, 0==no it does not sink out

Defined in module mod_detritus.F

```
  INTEGER ISINK_OUT
```

Read in subroutine 'get_parameter_new', which is in mod_parameter.F, initialized as 0 (zero).

```
                         ISINK_OUT     = 0
 !Read inputs
...
   READ(1,*) ISINK_OUT
```

detritus.F

```
     if(isink_out.eq.1) then
      D_SINK1(KBVM1)=W_D1*(DETRITE(KBVM1-1,J)-DETRITE(KBVM1,J))/DELTA_D(KBVM1) !Sink out
     else
      D_SINK1(KBVM1)=W_D1*(DETRITE(KBVM1-1,J))/DELTA_D(KBVM1) !No sink out
     endif
```

It is the last line in TP.in

VIDEO: [Creating comparison expressions across datasets in VisIt]

Look at with VisIt:

First, transfer variable to one of the meshes:Open files. output.0 is not settled out and I will call it 'kept', and output.1 is settled out and I will call that 'removed'

To compare, you need all the variables on the same mesh.

We want to compare the variable TP in a run

Recall:

output.0 = kept (not settled out)
output.1 = removed (settled out)

Define variables:

TP_kept = TP variable from output.0
TP_removed = TP variable from output.1

We would like to create an expression to compare these, such as

TP_diff = TP_kept - TP_removed

To create expressions, all variables must be placed on the same mesh.

To do this, we place a Donor variable on the Target mesh.

Then an expression can be made from any variables on the Target mesh.

For this example, we will put the variable TP from the run the way we were doing it before was 'kept', so the TP from output.0 will be that original 'kept', and we put

Controls:Data Level Comparisons:Between … two or more:
Put a donor field on a target mesh. The mesh is the same, so use Connectivity-based.
Name: TP_removed
Just place it on the donor field.

Next, create variable that is the difference (TP == TP_kept):
Controls:Expressions:New:TP_diff
TP_diff = TP - TP_removed
Apply

Percent Change: TP_perchange = (TP_removed - TP)/abs(TP)*100
Percent change going from TP with settling out, to not settling out, so should mainly see positive number, meaning there is more TP when it does not settle out.

In the following, you can do Controls:Launch CLI instead of Controls:Command as in the video if you want.) But if you put it in 'Command', it will usually save it for next time.

Here are the commands to cut and paste. I made the font small to avoid copy/paste errors. I added a step, defining TP_kept=TP (since it is easy, why not).

```
OpenDatabase("localhost:/Users/lisalowe/ORD/CURRENT_TEST/output.0/mi_0001.nc", 0)
OpenDatabase("localhost:/Users/lisalowe/ORD/CURRENT_TEST/output.1/mi_0001.nc", 0)
DefineScalarExpression("TP_removed", "conn_cmfe(</Users/lisalowe/ORD/CURRENT_TEST/output.1/mi_0001.nc[0]id:TP>, <SigmaLayer_Mesh>)")
DefineScalarExpression("TP_kept", "conn_cmfe(</Users/lisalowe/ORD/CURRENT_TEST/output.0/mi_0001.nc[0]id:TP>, <SigmaLayer_Mesh>)")
DefineScalarExpression("TP_diff", "TP_kept - TP_removed")
```

If you want to compare with Mark's data, then:

```
OpenDatabase("localhost:/Users/lisalowe/ORD/CURRENT_TEST/output.
0/mi_0001.nc", 0)
OpenDatabase("localhost:/Users/lisalowe/ORD/Everything/mi_gem_ar
chive/041820163/mi_0001.nc", 0)
DefineScalarExpression("TP_EPA",
"conn_cmfe(</Users/lisalowe/ORD/CURRENT_TEST/output.0/mi_0001.nc
[0]id:TP>, <SigmaLayer_Mesh>)")
```

```
DefineScalarExpression("TP_Mark", "PO4 +
0.016*(Detritus+Phytoplankton+Zooplankton)")
DefineScalarExpression("TP_diff", "TP_Mark - TP_EPA")
DefineScalarExpression("TP_percent_diff",
"abs(TP_EPA-TP_Mark)/((TP_EPA+TP_Mark)/2)*100")
DefineScalarExpression("TP_percent_change", "(TP_EPA -
TP_Mark)/abs(TP_Mark)*100")
```

VIDEO: Record a Macro in VisIt

Video for Recording a macro

- Open VisIt
- Controls:Command
- Find a clean tab, or make a clean tab
- Click Record

This will open a single file and then a group of files.

Hit Stop, and the Python commands will be displayed in the Window.

If you want to clean it up, you can usually delete the repeated commands and 'metadata' commands...but it doesn't hurt to leave them in, especially if you have two databases open.

Then copy and paste the commands to use later.

The next section records setting the Transform operator.

After recording the commands, look for the scaleZ variable, which was set to 1000 with the GUI.

You can change the numbers in the Python commands and hit Execute instead of using the GUI.

TEST case for correlations of multiple files (called 'database'):

```
OpenDatabase("localhost:/Users/lisalowe/ORD/CURRENT_TEST/output.0/mi_*.nc database", 0)
OpenDatabase("localhost:/Users/lisalowe/ORD/CURRENT_TEST/output.1/mi_*.nc database", 0)

CreateDatabaseCorrelation("Correlation01",("localhost:/Users/lisalowe/ORD/CURRENT_TEST/output.0/mi_*.nc database", "localhost:/Users/lisalowe/ORD/CURRENT_TEST/output.1/mi_*.nc database"), 2)

DefineScalarExpression("TP_removed", "conn_cmfe(</Users/lisalowe/ORD/CURRENT_TEST/output.1/mi_*.nc database[0]id:TP>, <SigmaLayer_Mesh>)")
DefineScalarExpression("TP_kept", "conn_cmfe(</Users/lisalowe/ORD/CURRENT_TEST/output.0/mi_*.nc database[0]id:TP>, <SigmaLayer_Mesh>)")

DefineScalarExpression("TP_diff", "TP_kept - TP_removed")

DefineScalarExpression("OneHundred","100.0*TP_removed")
DefineScalarExpression("OneThousand","1000.0*TP_removed")
DefineScalarExpression("OneminusOne","OneHundred*10. - OneThousand")
```

To make myself a session that has the 4 plots with the proper time correlation set, I did:
1) Use the **Python expressions** to read in the databases and make the correlations. (I'll cut/paste below what I think should work on atmos.) Add Pseudocolors of TP, TP_EPA, TP_Mark, and TP_diff to the plot. Save the session! I closed VisIt and reopened, to make sure it saved what I wanted.
2) Reopen that session, and make 3 more windows by making a clone of the first window (right click, Window:Clone). Lock all of the windows. It should not ask to create any database correlations because it was already defined in the first window. I saved this session with another name.
3) Now I removed 3 plots from each window, leaving just one - TP in the first, TP_EPA in the second, etc. And saved the session....
4) Then I added the annotations, which is just the text TP, TP_EPA, etc. That made it crash the first time, so I saved it in a different session.

Here are the Python expressions:

```
#compare our 2010 model with Mark's 2010 model (same settling approach)
OpenDatabase("atmost.nesc.epa.gov:/work/GLFBREEZ/Lake_Michigan/FVCOM_4_3_1/fvcom43-master/FVCOM_source/run4/output/mi_*.nc database", 0)
OpenDatabase("atmost.nesc.epa.gov:/work/GLFBREEZ/Lake_Michigan/MRowe_Files/mi_gem_archive/041820163/mi_*.nc database", 0)
CreateDatabaseCorrelation("Correlation01",("atmost.nesc.epa.gov:/work/GLFBREEZ/Lake_Michigan/FVCOM_4_3_1/fvcom43-master/FVCOM_source/run4/output/mi_*.nc database", "atmost.nesc.epa.gov:/work/GLFBREEZ/Lake_Michigan/MRowe_Files/mi_gem_archive/041820163/mi_*.nc database"), 2)
DefineScalarExpression("TP_EPA", "conn_cmfe(</work/GLFBREEZ/Lake_Michigan/FVCOM_4_3_1/fvcom43-master/FVCOM_source/run4/output/mi_*.nc database[0]id:TP>, <SigmaLayer_Mesh>)")
DefineScalarExpression("TP_Mark", "PO4 + 0.016*(Detritus+Phytoplankton+Zooplankton)")
DefineScalarExpression("TP_diff", "TP_Mark - TP_EPA")

##James Linux paths:
EPA_database"atmost.nesc.epa.gov:/work/GLFBREEZ/Lake_Michigan/FVCOM_4_3_1/fvcom43-master/FVCOM_source/run4/output/mi_*.nc database"
MARK_database = "atmost.nesc.epa.gov:/work/GLFBREEZ/Lake_Michigan/MRowe_Files/mi_gem_archive/041820163/mi_*.nc database"
##This is so persnickety, just put in the whole path exactly for now
conn_string = r"conn_cmfe(</work/GLFBREEZ/Lake_Michigan/FVCOM_4_3_1/fvcom43-master/FVCOM_source/run4/output/mi_*.nc database[0]id:TP>, <SigmaLayer_Mesh>)"
```