

Release Notes for Lacher 2017 Update to Pool and Dickinson (2007) Groundwater Model of the Upper San Pedro Basin

Feb 2018









The files included here are those used to produce the results described in the accompanying report:

Lacher, L.J., 2017, "Interim Update to Sierra Vista Subwatershed Pumping and Artificial Recharge Rates in the Upper San Pedro Basin Groundwater Model," report prep for The Nature Conservancy, June, 53 p.

The original model is described here: <https://pubs.usgs.gov/sir/2006/5228/>

Files provided via the USPP website:

The complete set of files available for download is provided in eight (8) compressed ".zip" files, and shown in the table below.

 v2017_2003_2030_SVrch1-str2-N.zip	3/1/2018 11:03 AM	Compressed (zipped) Folder	201,907 KB
 v2017_2003_2030_SVrch1-str2-N_MODFLOW_text.zip	3/1/2018 11:19 AM	Compressed (zipped) Folder	5,382 KB
 v2017_2030_2057_SVrch1a-str2-N_MODFLOW.zip	3/1/2018 11:04 AM	Compressed (zipped) Folder	214,700 KB
 v2017_2030_2057_SVrch1a-str2-N_MODFLOW_text.zip	3/1/2018 11:19 AM	Compressed (zipped) Folder	5,359 KB
 v2017_2057_2084_SVrch1a-str2-N_MODFLOW.zip	3/1/2018 11:06 AM	Compressed (zipped) Folder	207,535 KB
 v2017_2057_2084_SVrch1a-str2-N_MODFLOW_text.zip	3/1/2018 11:20 AM	Compressed (zipped) Folder	5,362 KB
 v2017_2084_2100_SVrch1a-str2-N_MODFLOW.zip	3/1/2018 11:07 AM	Compressed (zipped) Folder	164,062 KB
 v2017_2084_2100_SVrch1a-str2-N_MODFLOW_text.zip	3/1/2018 11:20 AM	Compressed (zipped) Folder	4,143 KB

The model files cover the simulation period 2003 to 2100. The simulation files are divided into 4 time periods:

- 2003-2030
- 2030-2057
- 2057-2084
- 2084-2100.

These time periods reflect the 17-year duration chosen by the authors of the original model (Pool and Dickinson, 2007), and simply ease computational demands and data file size.

Users may download a free utility for extracting files from the posted ZIP files at <http://www.7-zip.org/>.

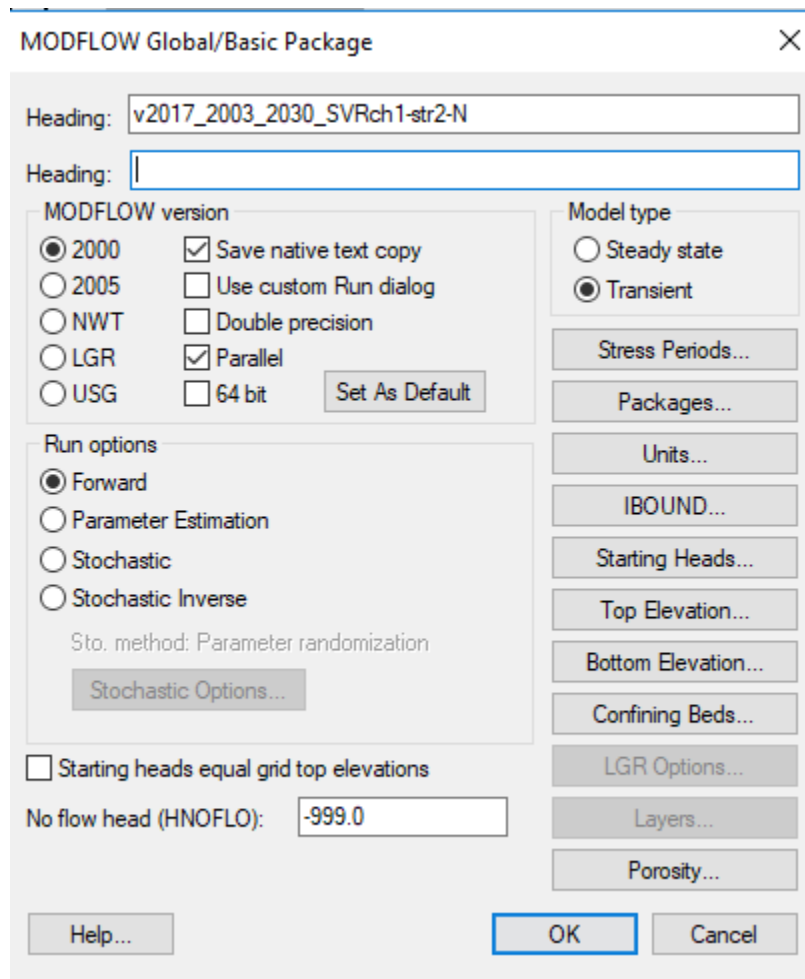
The model files labeled "v2017_2003_2030_SVrch1-str2-N GMS.zip" or "v2017_20XX_2XXX_SVrch1a-str2-N GMS.zip" are input files plus select output files produced by the computer modeling software program Groundwater Modeling System (GMS) by Aquaveo™. Information on GMS is provided here: <https://www.aquaveo.com/software/gms-groundwater-modeling-system-introduction>

Users may download an evaluation version of the latest version of the GMS software here:

<https://www.aquaveo.com/products>

The files labeled “v2017_2003_2030_SVRch1-str2-N_MODFLOW_text.zip” and “v2017_20XX_2XXX_SVRch1a-str2-N_MODFLOW_text.zip” include native MODFLOW-2000 text input files produced by GMS v. 10.3. NOTE: These files may require some manipulation to run in DOS-based MODFLOW or in other groundwater modeling programs. The files are provided here for the user’s convenience but include no guarantees about their functionality outside of GMS 10.2 or higher.

For additional convenience to the user, the following screen shots from GMS 10.3 illustrate some of the key global variables used in the simulations.





Number of stress periods:

Use dates/times

Total time: 9862.0 (d)

	Start	Length	Num Time Steps	Multiplier	Steady state
▶ 1	3/12/2003 12:00:00 ...	217.0	10	1.5	<input type="checkbox"/>
2	10/15/2003 12:00:00 ...	149.0	10	1.5	<input type="checkbox"/>
3	3/12/2004 12:00:00 AM	217.0	10	1.5	<input type="checkbox"/>
4	10/15/2004 12:00:00 ...	148.0	10	1.5	<input type="checkbox"/>
5	3/12/2005 12:00:00 AM	217.0	10	1.5	<input type="checkbox"/>
6	10/15/2005 12:00:00 ...	148.0	10	1.5	<input type="checkbox"/>
7	3/12/2006 12:00:00 AM	217.0	10	1.5	<input type="checkbox"/>
8	10/15/2006 12:00:00 ...	148.0	10	1.5	<input type="checkbox"/>
9	3/12/2007 12:00:00 AM	217.0	10	1.5	<input type="checkbox"/>
10	10/15/2007 12:00:00 ...	149.0	10	1.5	<input type="checkbox"/>
11	3/12/2008 12:00:00 AM	217.0	10	1.5	<input type="checkbox"/>
12	10/15/2008 12:00:00 ...	148.0	10	1.5	<input type="checkbox"/>
13	3/12/2009 12:00:00 AM	217.0	10	1.5	<input type="checkbox"/>
14	10/15/2009 12:00:00 ...	148.0	10	1.5	<input type="checkbox"/>
15	3/12/2010 12:00:00 AM	217.0	10	1.5	<input type="checkbox"/>
16	10/15/2010 12:00:00 ...	148.0	10	1.5	<input type="checkbox"/>
17	3/12/2011 12:00:00 AM	217.0	10	1.5	<input type="checkbox"/>
18	10/15/2011 12:00:00 ...	149.0	10	1.5	<input type="checkbox"/>
19	3/12/2012 12:00:00 AM	217.0	10	1.5	<input type="checkbox"/>
20	10/15/2012 12:00:00 ...	148.0	10	1.5	<input type="checkbox"/>
21	3/12/2013 12:00:00 AM	217.0	10	1.5	<input type="checkbox"/>
22	10/15/2013 12:00:00 ...	148.0	10	1.5	<input type="checkbox"/>
23	3/12/2014 12:00:00 AM	217.0	10	1.5	<input type="checkbox"/>
24	10/15/2014 12:00:00 ...	148.0	10	1.5	<input type="checkbox"/>
25	3/12/2015 12:00:00 AM	217.0	10	1.5	<input type="checkbox"/>
26	10/15/2015 12:00:00 ...	149.0	10	1.5	<input type="checkbox"/>
27	3/12/2016 12:00:00 AM	217.0	10	1.5	<input type="checkbox"/>
28	10/15/2016 12:00:00 ...	148.0	10	1.5	<input type="checkbox"/>
29	3/12/2017 12:00:00 AM	217.0	10	1.5	<input type="checkbox"/>
30	10/15/2017 12:00:00 ...	148.0	10	1.5	<input type="checkbox"/>
31	3/12/2018 12:00:00 AM	217.0	10	1.5	<input type="checkbox"/>
32	10/15/2018 12:00:00 ...	148.0	10	1.5	<input type="checkbox"/>
33	3/12/2019 12:00:00 AM	217.0	10	1.5	<input type="checkbox"/>
34	10/15/2019 12:00:00 ...	149.0	10	1.5	<input type="checkbox"/>
35	3/12/2020 12:00:00 AM	217.0	10	1.0	<input type="checkbox"/>
36	10/15/2020 12:00:00 ...	148.0	10	1.0	<input type="checkbox"/>
37	3/12/2021 12:00:00 AM	217.0	10	1.0	<input type="checkbox"/>
38	10/15/2021 12:00:00 ...	148.0	10	1.0	<input type="checkbox"/>
39	3/12/2022 12:00:00 AM	217.0	10	1.0	<input type="checkbox"/>
40	10/15/2022 12:00:00 ...	148.0	10	1.0	<input type="checkbox"/>
41	3/12/2023 12:00:00 AM	217.0	10	1.0	<input type="checkbox"/>
42	10/15/2023 12:00:00 ...	149.0	10	1.0	<input type="checkbox"/>
43	3/12/2024 12:00:00 AM	217.0	10	1.0	<input type="checkbox"/>
44	10/15/2024 12:00:00 ...	148.0	10	1.0	<input type="checkbox"/>
45	3/12/2025 12:00:00 AM	217.0	10	1.0	<input type="checkbox"/>
46	10/15/2025 12:00:00 ...	149.0	10	1.0	<input type="checkbox"/>
47	3/12/2026 12:00:00 AM	217.0	10	1.0	<input type="checkbox"/>
48	10/15/2026 12:00:00 ...	148.0	10	1.0	<input type="checkbox"/>
49	3/12/2027 12:00:00 AM	217.0	10	1.0	<input type="checkbox"/>
50	10/15/2027 12:00:00 ...	149.0	10	1.0	<input type="checkbox"/>
51	3/12/2028 12:00:00 AM	217.0	10	1.0	<input type="checkbox"/>
52	10/15/2028 12:00:00 ...	148.0	10	1.0	<input type="checkbox"/>
53	3/12/2029 12:00:00 AM	217.0	10	1.0	<input type="checkbox"/>
54	10/15/2029 12:00:00 ...	149.0	10	1.0	<input type="checkbox"/>

MODFLOW Packages / Processes



Flow package

- BCF - Block-Centered Flow
- HUF - Hydrogeologic Unit Flow
- LPF - Layer Property Flow
- UPW - Upstream Weighting

Solver

- DE4 - Direct
- GMG - Geometric Multigrid
- LMG - Link-AMG
- NWT - Newton
- PCG - Pre. Conj.-Gradient
- PCGN - PCG with Imp. Nonlin.
- SIP1 - Strongly Impl. Proc.
- SMS - Sparse Matrix \ LMG-USG
- SOR1 - Slice Succ. Overrel.

Optional packages / processes

- BCT - Block Centered Transport
- BFH - Boundary Flow and Head
- CHD1 - Time-Variant Specified-Head
- CLN - Connected Linear Network Process
- DRN1 - Drain
- DRT1 - Drain Return
- ETS1 - Evapotranspiration Segments
- EVT1 - Evapotranspiration
- GAGE - Gage
- GHB1 - General-Head Boundary
- GNC - Ghost Node Correction
- HFB6 - Horizontal Flow Barrier
- LAK3 - Lake
- MNW1 - Multi-Node Well
- MNW2 - Multi-Node Well
- MNWI - Multi-Node Well Information
- PEST-ASP
- RCH1 - Recharge
- RIV1 - River
- SFR2 - Streamflow-Routing
- STR1 - Stream
- SUB - Subsidence
- SWI2 - Seawater Intrusion
- UZF - Unsaturated Zone Flow
- WEL1 - Well

Help...

OK

Cancel

Units ×

Length*:

Time:

Mass:

Force:

Concentration:

NOTE: These values do not affect model input values.
*Length units are specified in the display projection.

LPF Package ×

Layer property entry method

Use data arrays Use material IDs

Layer data

Layer:

Layer type:

Confined

Convertible

Convertible Negative

Convertible Upstream

Vertical hydraulic conductivity:

Specify Kv

Specify anisotropy factors

Interblock transmissivity:

Cell wetting parameters

Allow wetting of cells

Wetting factor: Wetting iter. interval:

Wetting equation:

MODFLOW PCG Package



Maximum number of outer iterations (MXITER):	<input type="text" value="99"/>
Number of inner iterations (ITER1):	<input type="text" value="99"/>
Matrix preconditioning method (NPCOND):	(1) Modified Incomplete Chole <input type="text"/>
Active cells surrounded by dry cells (IHCOFADD):	(0) Goes dry regardless of HCl <input type="text"/>
Head change criterion for convergence (HCCLOSE):	<input type="text" value="0.1"/> (m)
Residual criterion for convergence (RCLOSE):	<input type="text" value="9.0"/> (m ³ /d)
Relaxation parameter (RELAX):	<input type="text" value="0.96"/>
Eigenvalue upper bound (NBPOL):	(<>2) Calculate eigenvalue up <input type="text"/>
Damping for all, or if < 0, only SS stress periods (DAMPPCG):	<input type="text" value="1.0"/>
Damping for transient stress periods (DAMPPCGT):	<input type="text" value="0.0"/>
Printout interval (IPRPCG):	<input type="text" value="0"/>
Printing of convergence info (MUTPCG):	(0) Max head change and resi <input type="text"/>

Help...

Reset

OK

Cancel



MODFLOW Name File



Files for packages not supported by GMS are listed as Unsupported in the Package column, but will be included when running MODFLOW. Unsupported files can be removed from the model using the Remove button.

Ftype	Package	Unit #	File Name	Edit Unsupported
LIST		702	v2017_2003_2030_SVrch1-str2-N.out	
DATA(BINARY)	OC	730	v2017_2003_2030_SVrch1-str2-N.hed	
DATA(BINARY)	OC	740	v2017_2003_2030_SVrch1-str2-N.ccf	
DATA(BINARY)	SFR/STR	2	v2017_2003_2030_SVrch1-str2-N.ccf2	
OBS		750	v2017_2003_2030_SVrch1-str2-N.obs	
HOB		751	v2017_2003_2030_SVrch1-str2-N.hob	
DIS		719	v2017_2003_2030_SVrch1-str2-N.dis	
BAS6		703	v2017_2003_2030_SVrch1-str2-N.ba6	
LPF		704	v2017_2003_2030_SVrch1-str2-N.lpf	
OC		715	v2017_2003_2030_SVrch1-str2-N.oc	
RCH		716	v2017_2003_2030_SVrch1-str2-N.rch	
WEL		709	v2017_2003_2030_SVrch1-str2-N.wel	
DRN		710	v2017_2003_2030_SVrch1-str2-N.drn	
EVT		712	v2017_2003_2030_SVrch1-str2-N.evt	
STR		717	v2017_2003_2030_SVrch1-str2-N.str	
CHD		713	v2017_2003_2030_SVrch1-str2-N.chd	
PCG		714	v2017_2003_2030_SVrch1-str2-N.pcg	

Help...

Remove

OK

Cancel