

Lakes and Reservoirs in WRF-Hydro

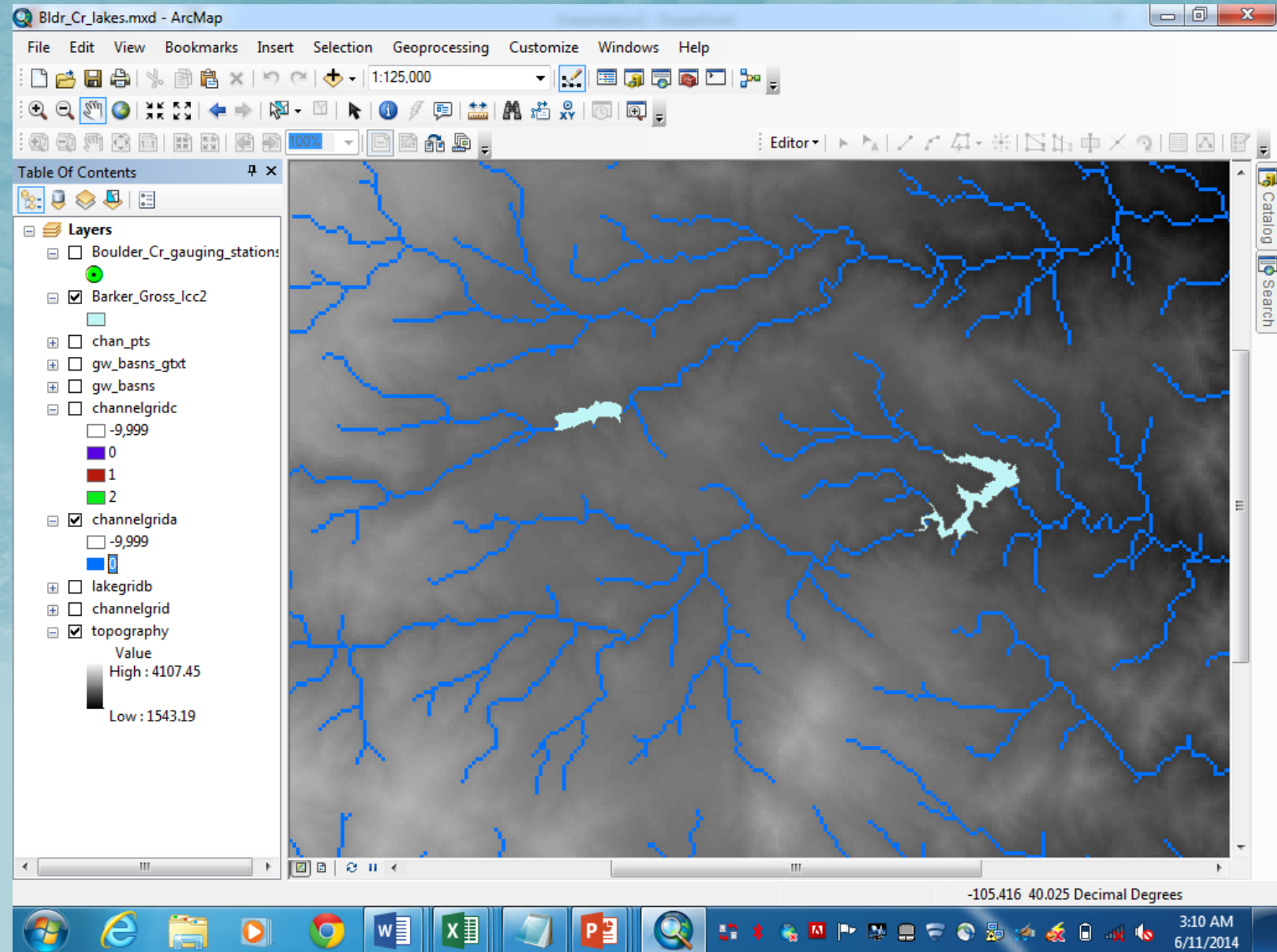
Outline: Implementing lakes and reservoirs in WRF-Hydro

- On-channel reservoirs
- Level-pool storage
- Multiple discharge modes
 - Orifice flow
 - Spillway flow
 - Rule curve
 - Mgt. Schedule

This procedure will help isolate problems which may otherwise be difficult and/or time-consuming to diagnose in many implementations:

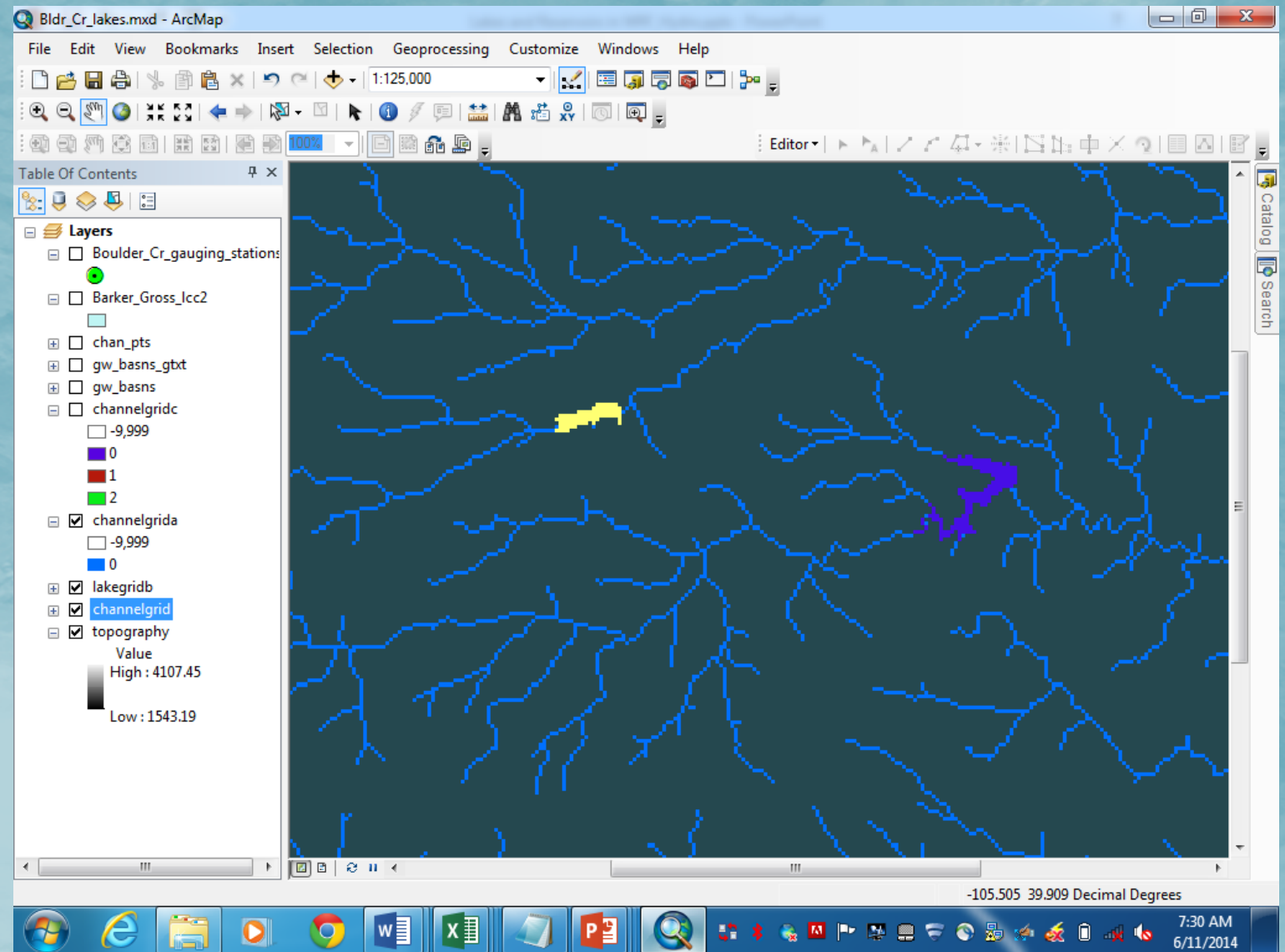
Implementing lakes and reservoirs in WRF-Hydro

1. After deriving channel network without reservoirs, overlay lake polygons on top of channel grid



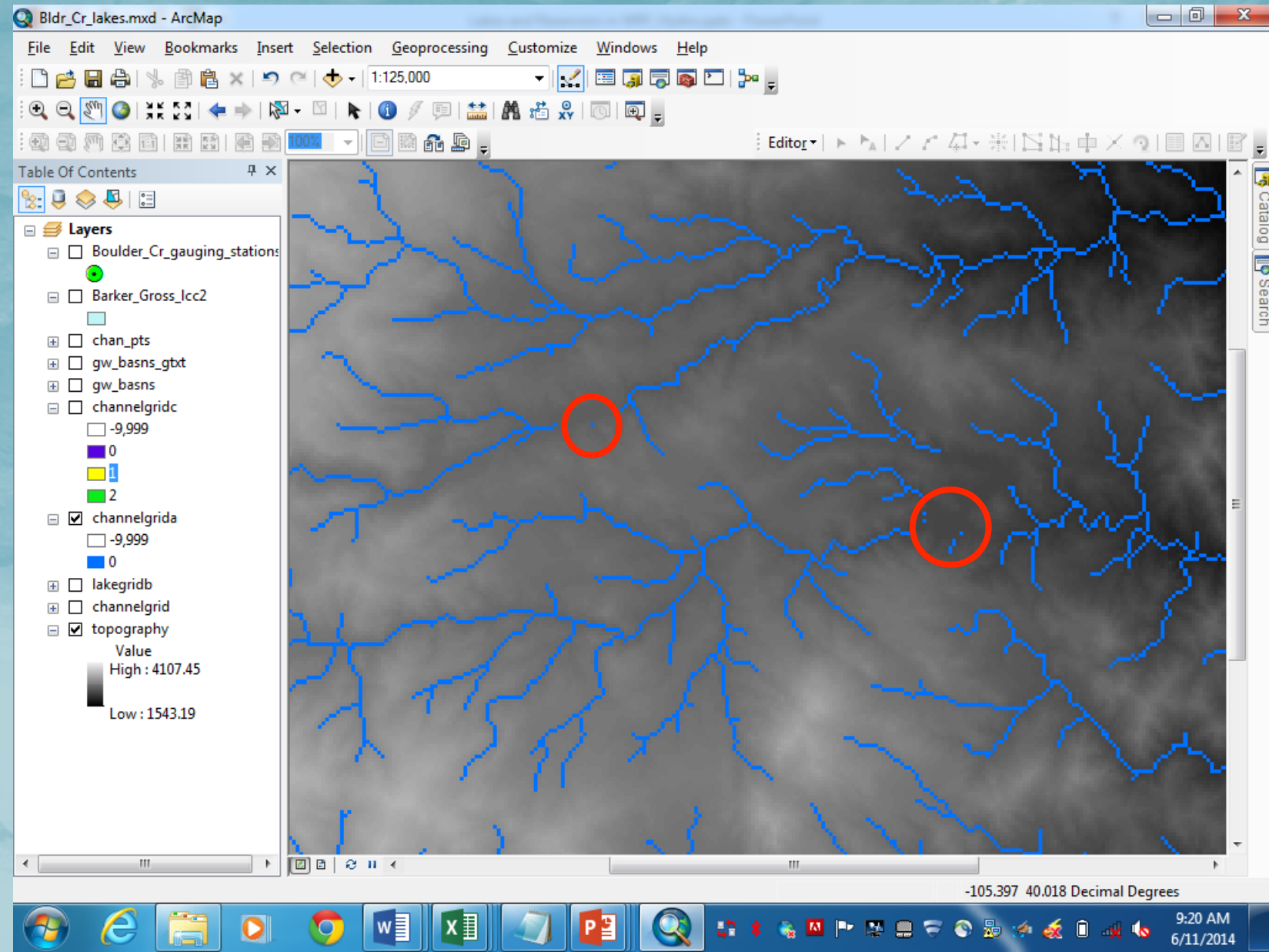
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1. Convert lake polygon into grid at the same resolution and projection as the channel grid



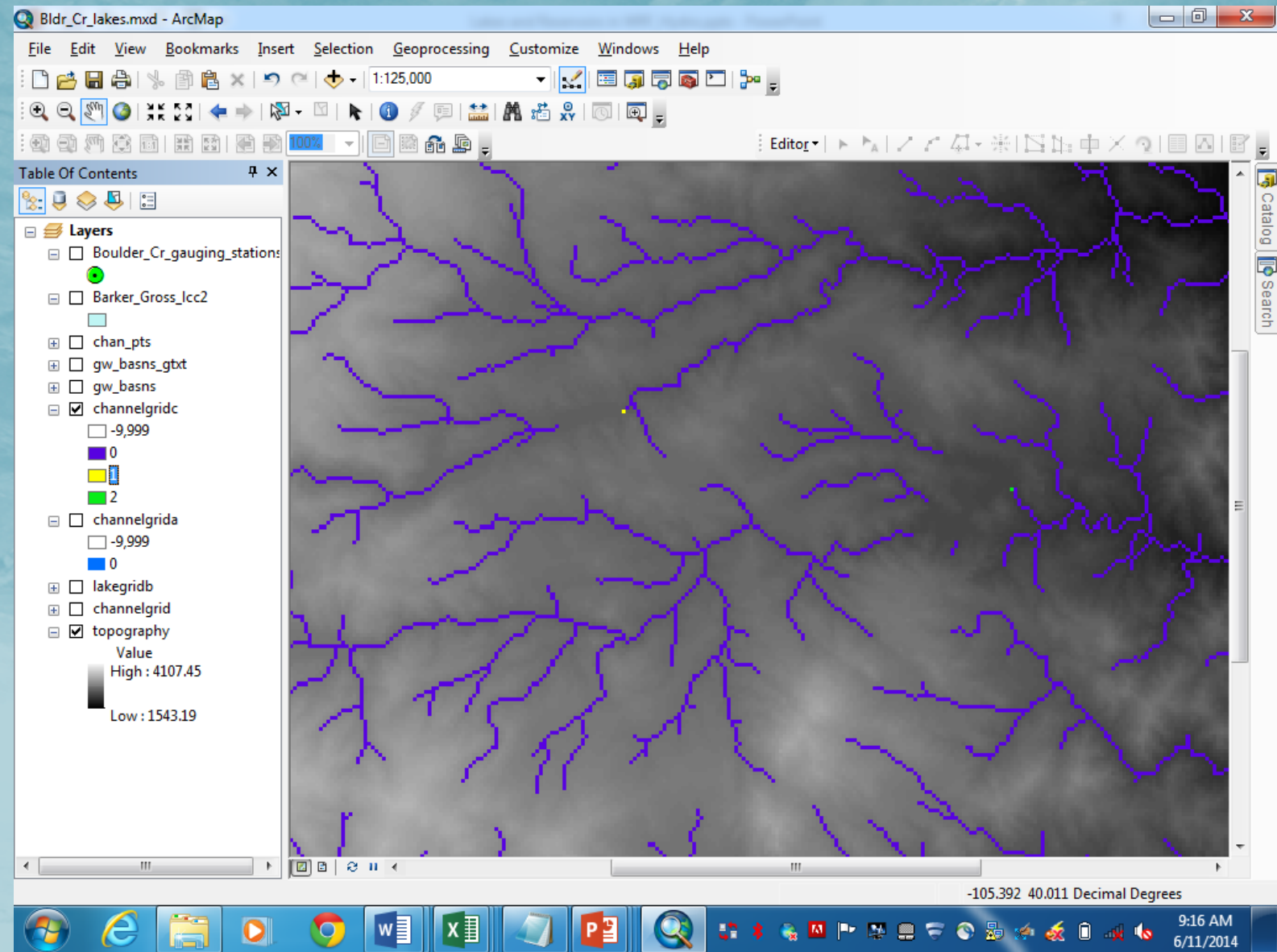
Implementing lakes and reservoirs in WRF-Hydro

1. Using lake grids as masks, then remove channel grid points 'underneath' lakes
2. If channel artifacts exist (see red circles), users will need to remove those by directing editing of grids or conversion to points



Implementing lakes and reservoirs in WRF-Hydro

1. Need to change value of selected channel grid elements to specify where reservoir discharge is input into channel
2. Channel grid at reservoir discharge location has same index value as reservoir



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1. Parameter Table (LAKEPARM.TBL)

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David Gochis

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A7. Lake parameters table (LAKEPARM.TBL)

LAKEPARM.TBL

<u>lake</u>	<u>LkArea</u>	<u>LkMxH</u>	<u>WeirC</u>	<u>WeirL</u>	<u>OrificC</u>	<u>OrificeA</u>	<u>OrificeE</u>
	<u>lat</u>	<u>long</u>		<u>elevation</u>			
1	9.67	1752.1	0.4	12.1	0.1	1.0	1664.4
	40.5580	-105.1586		1752.1			
2	3.07	1530.8	0.4	3.8	0.1	1.0	1519.6
	40.4407	-105.0586		1530.8			
3	1.61	1537.7	0.4	2.0	0.1	1.0	1528.7
	40.4158	-105.0903		1537.7			
4	1.11	1554.6	0.4	1.4	0.1	1.0	1544.4
	40.3876	-105.1441		1554.6			
5	3.82	1785.1	0.4	4.8	0.1	1.0	1758.2
	40.3377	-105.2196		1785.1			
6	1.36	1569.5	0.4	1.7	0.1	1.0	1565.6
	40.3378	-105.1278		1569.5			
7	1.47	1571.1	0.4	1.8	0.1	1.0	1565.3
	40.3297	-105.1167		1571.1			

- this example assumes there are 7 lakes defined within the simulation domain (note column wrapping...)

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1. Visualization of lake impacts

