Wood River Valley
Model Construction Update

Jason C. Fisher

U.S. Geological Survey
Idaho Department of Water Resources

USGS

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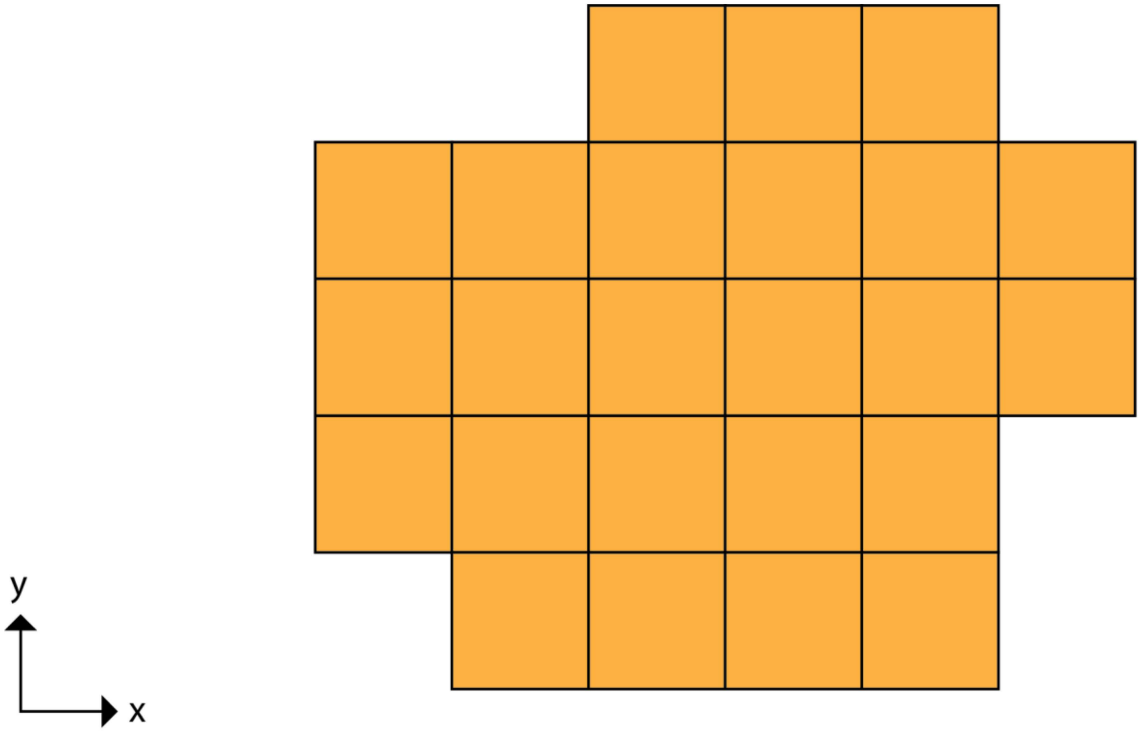
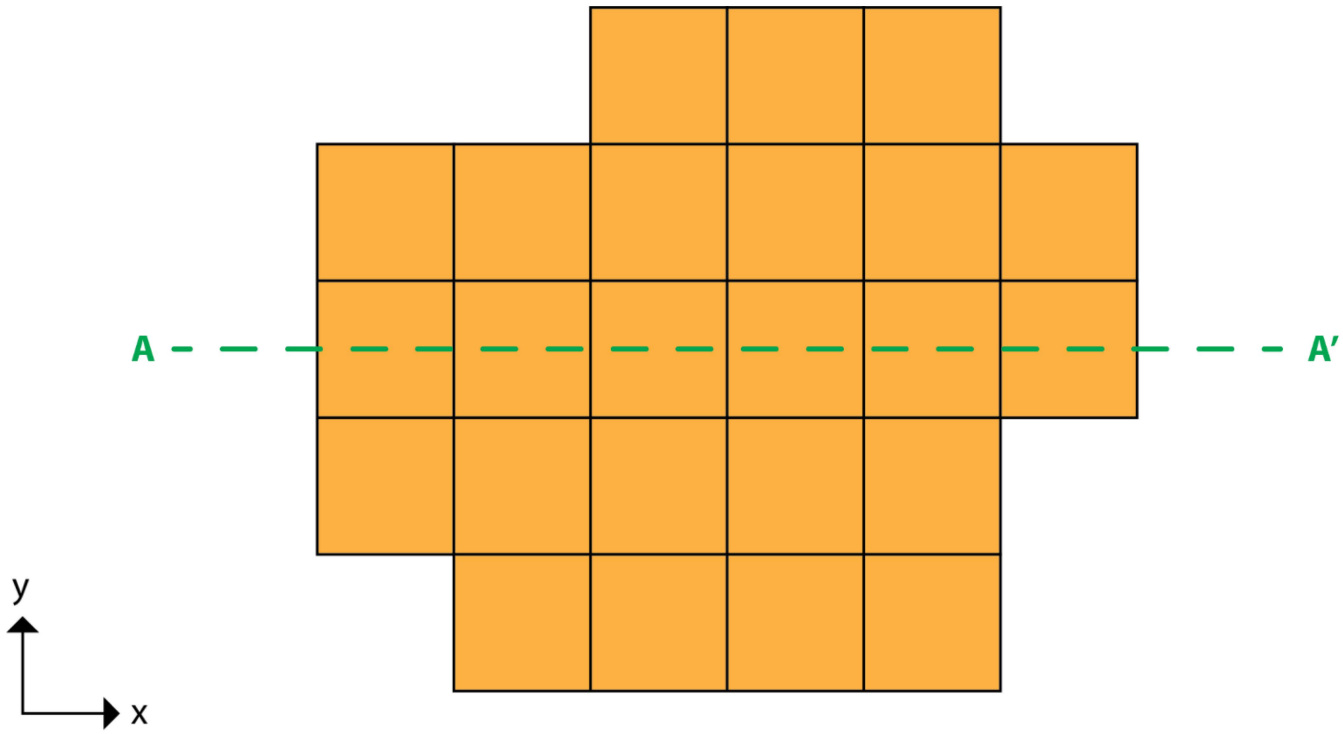
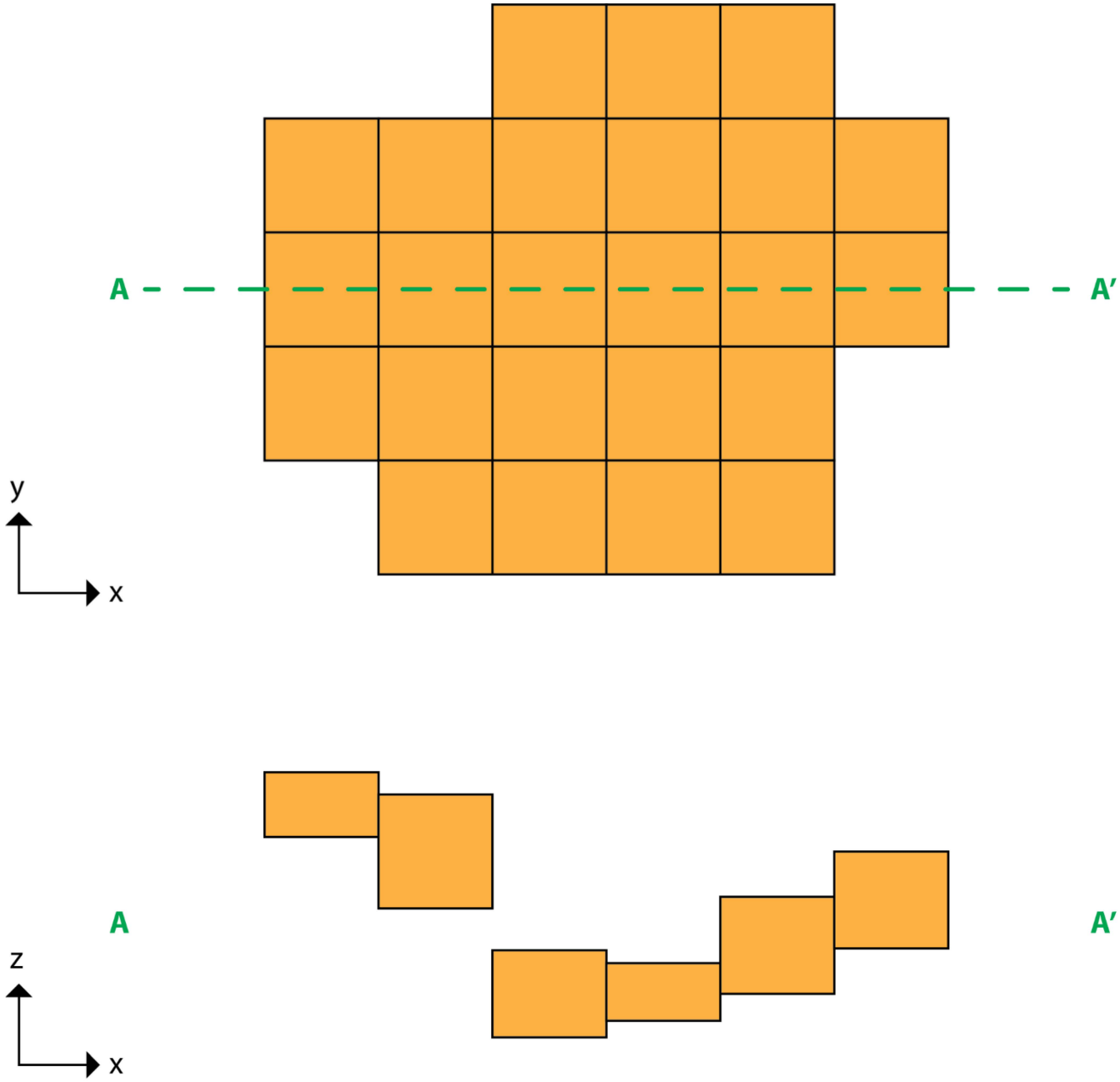
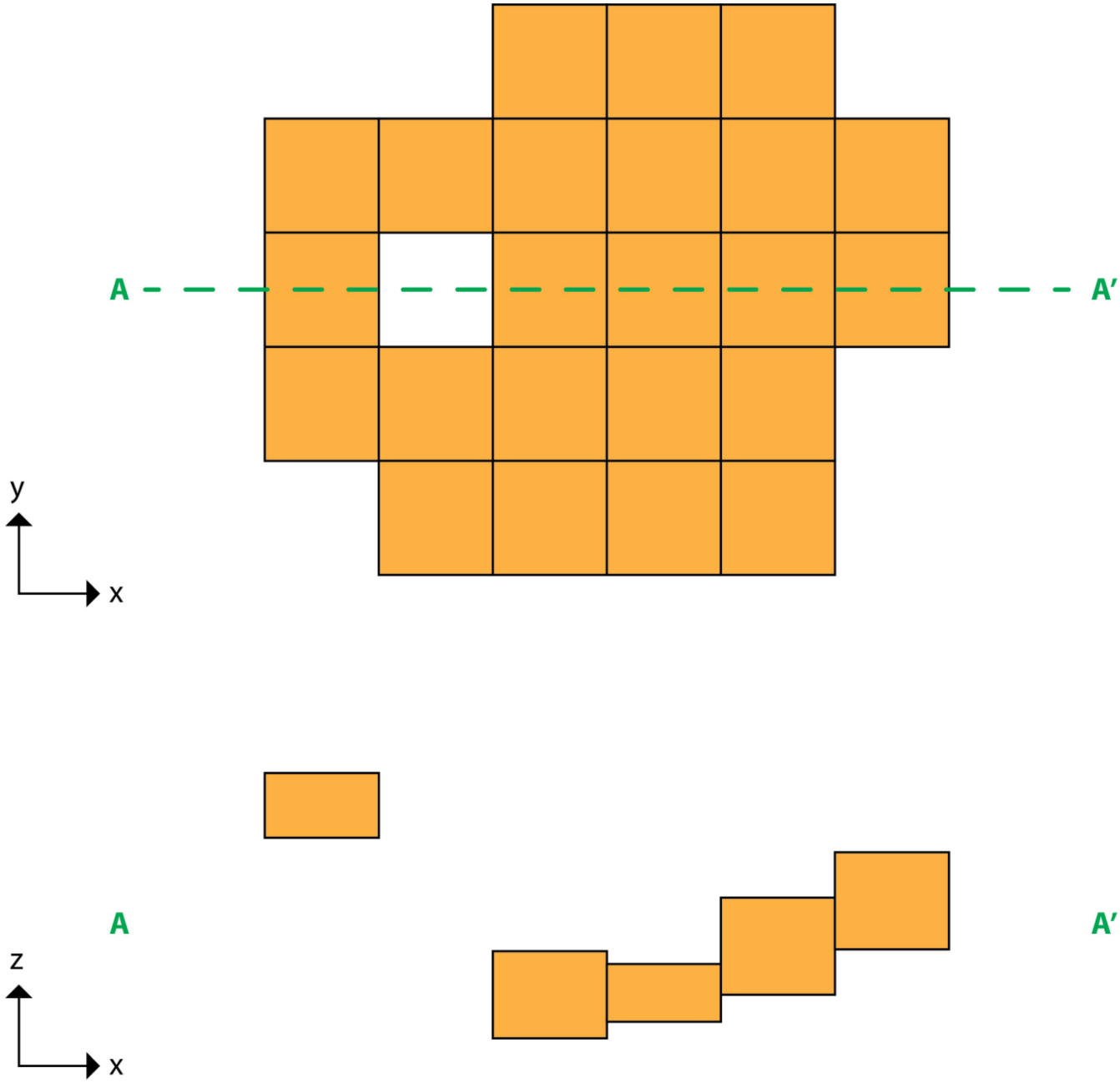
These slides were presented at the Wood River Valley Modeling Technical Advisory Committee meeting Thursday, 8/12/2014, 10am-3pm at the Community Campus, Black Box Room, in Hailey. Taken outside the context of the original presentation, these slides may not provide a complete or accurate representation of the speaker’s intent.

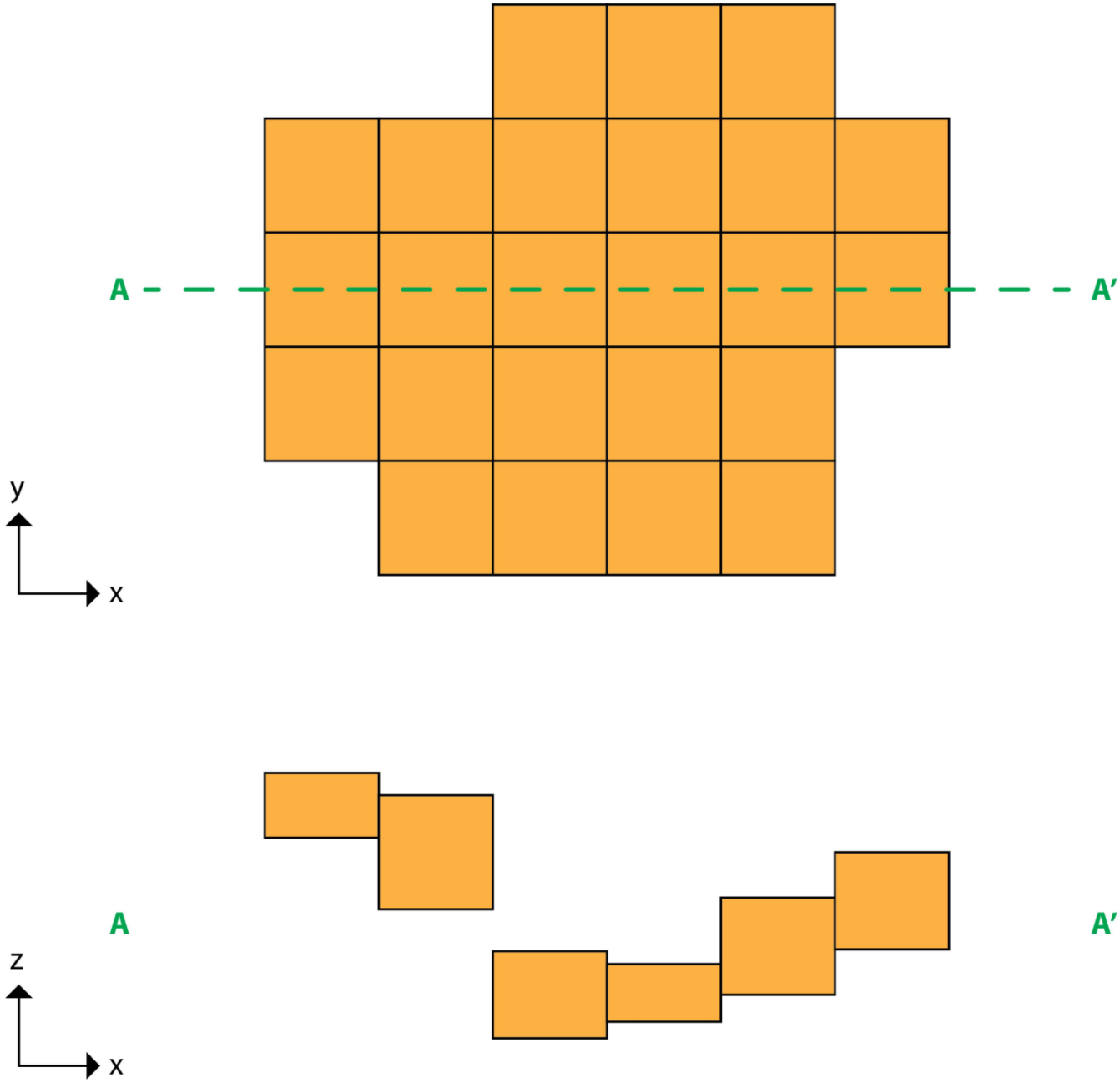
Vertical Overlap Between Adjacent Model Cells

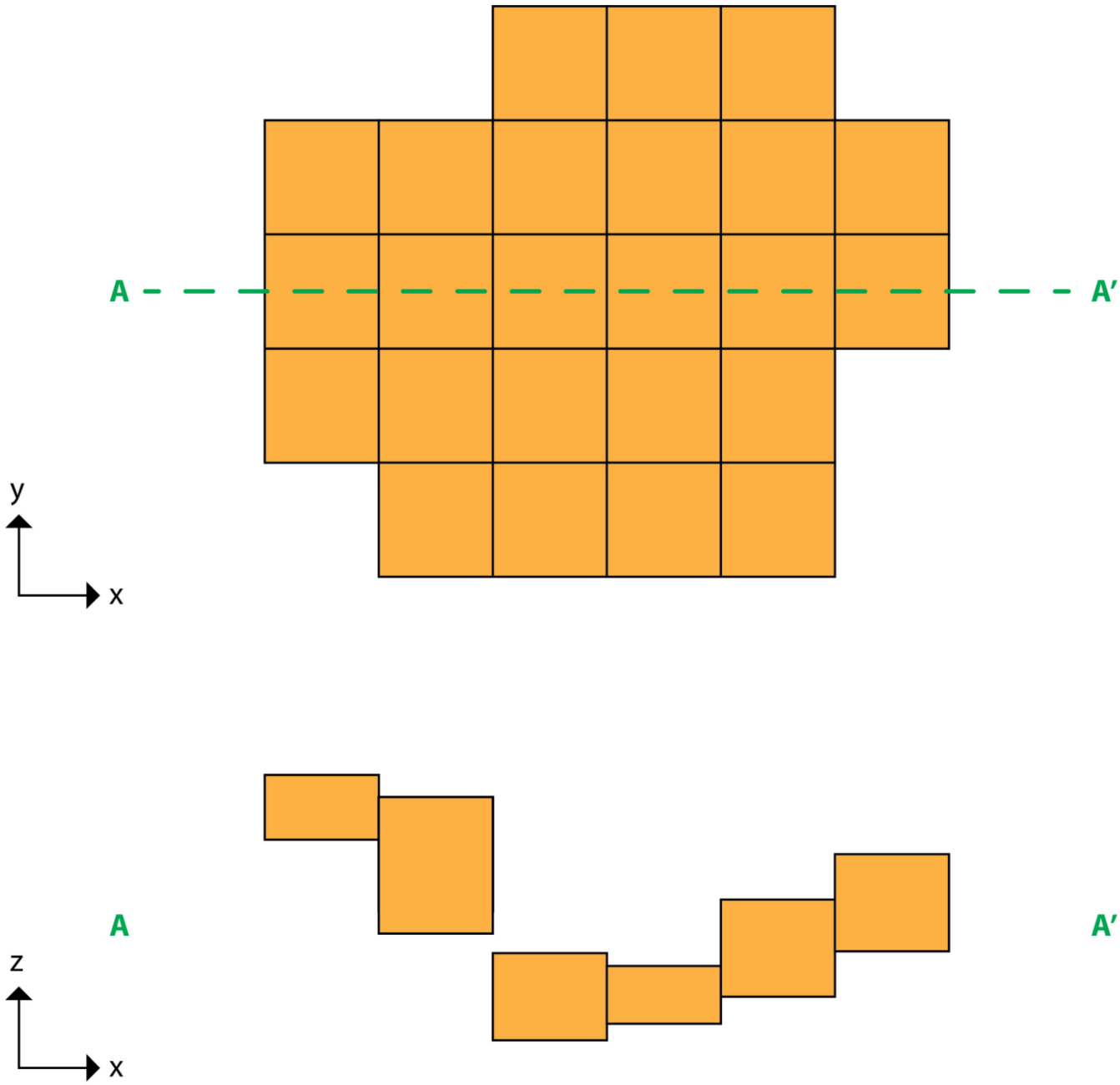

y
x

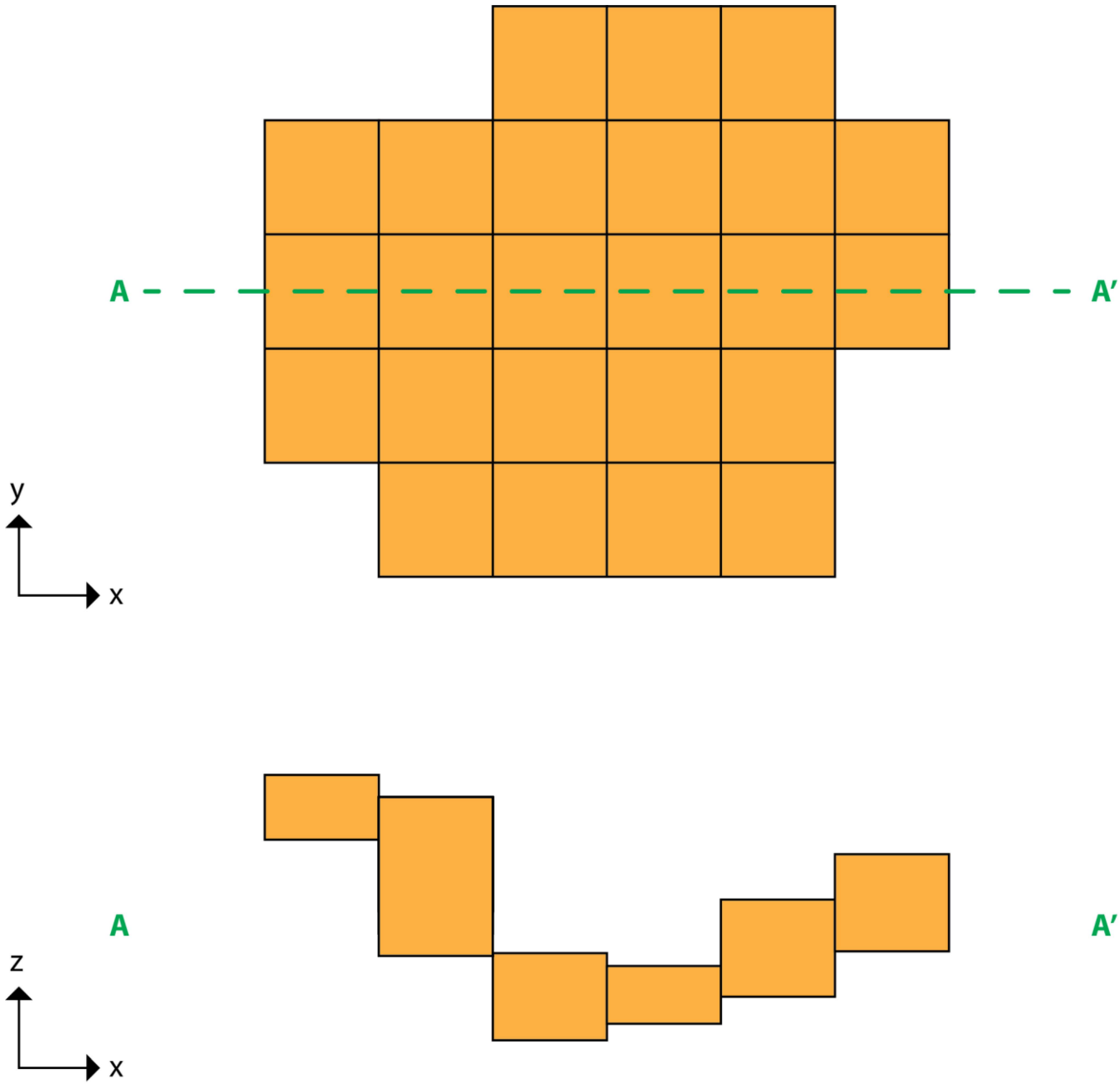

A
A′
y
x

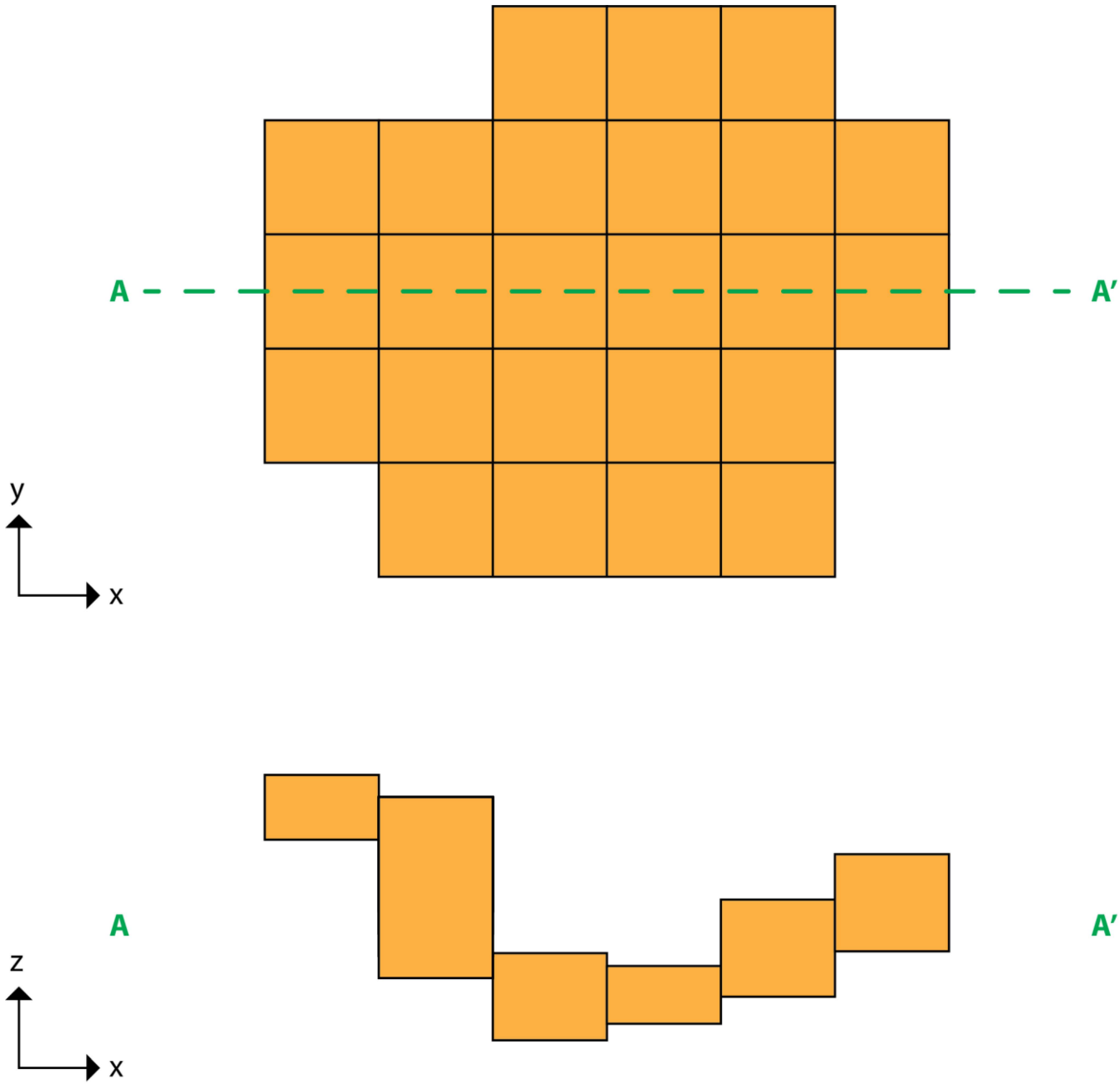

A
A′
y
x
A
A′
z
x

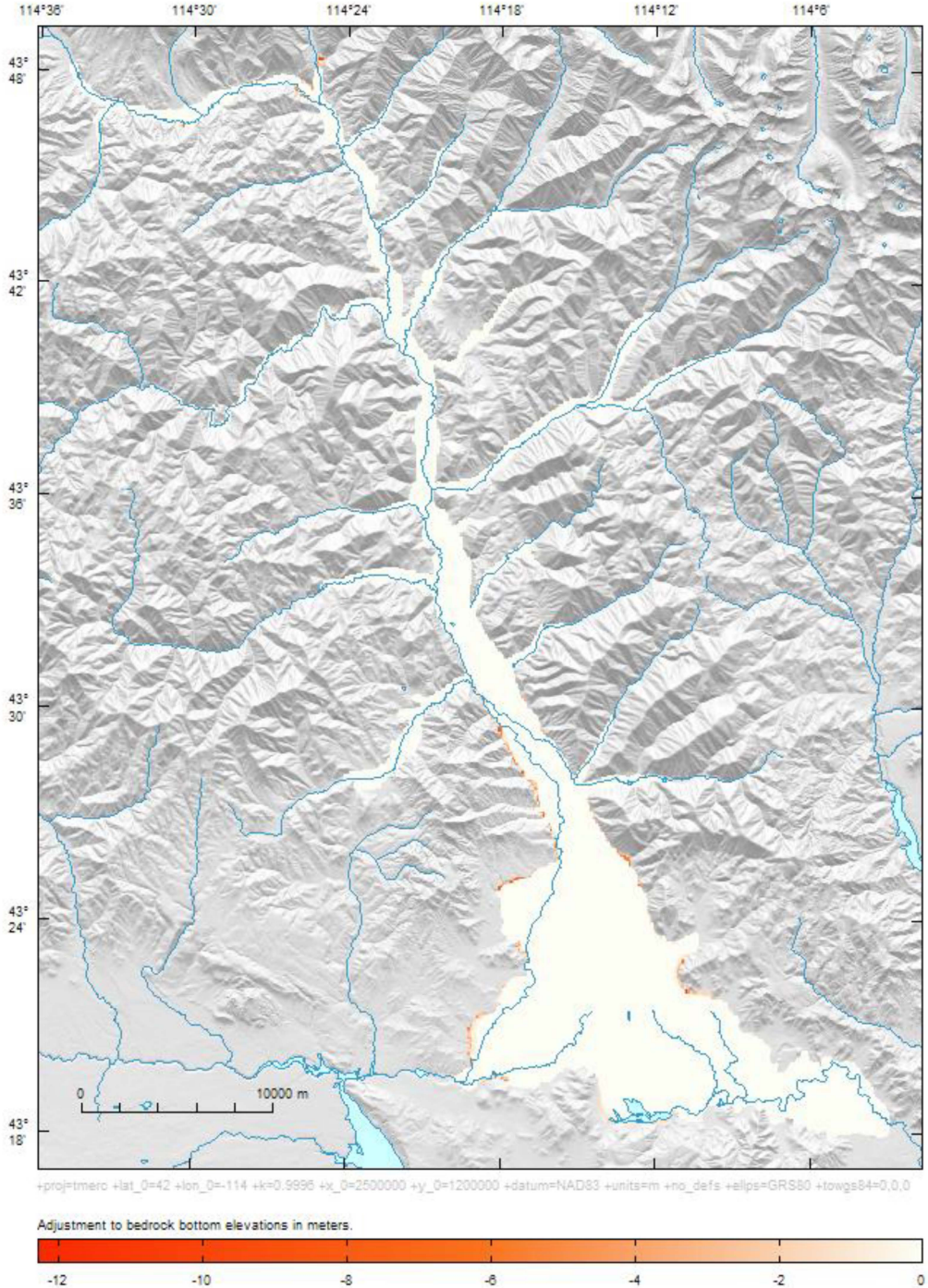

A
A′
y
x
A
A′
z
x


A
A′
y
x
A
A′
z
x

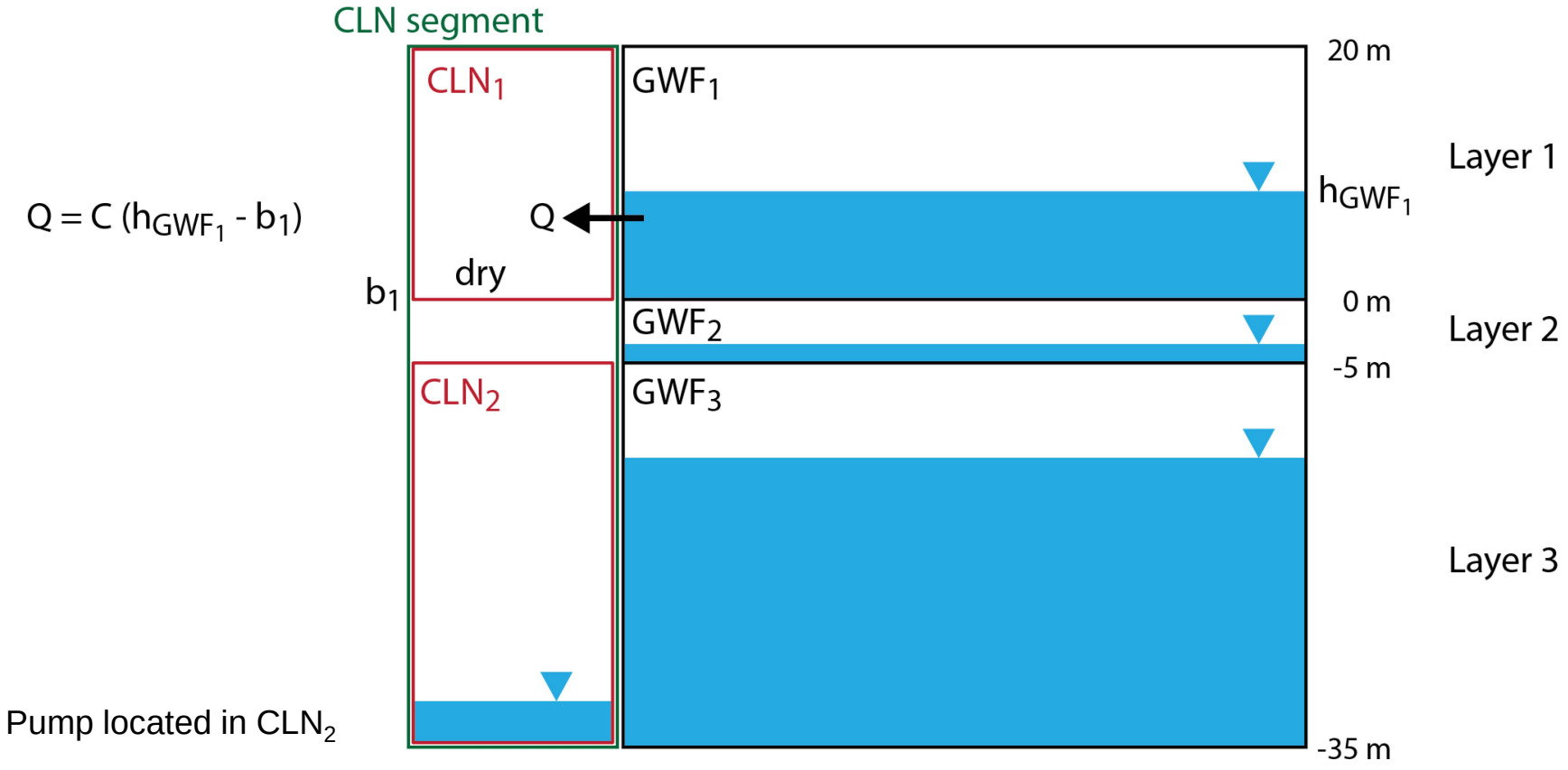

A
A′
y
x
A
A′
z
x


A
A′
y
x
A
A′
z
x


A
A′
y
x
A
A′
z
x


114°36'
114°30'
114°24'
114°18'
114°12'
114°6'
43° 48'
43° 42'
43° 36'
43° 30'
43° 24'
43° 18'
0
10000 m
+proj=tmerc +lat_0=42 +lon_0=-114 +k=0.9996 +x_0=2500000 +y_0=1200000 +datum=NAD83 +units=m +no_defs +ellps=GRS80 +towgs84=0,0,0
Adjustment to bedrock bottom elevations in meters.
-12
-10
-8
-6
-4
-2
0

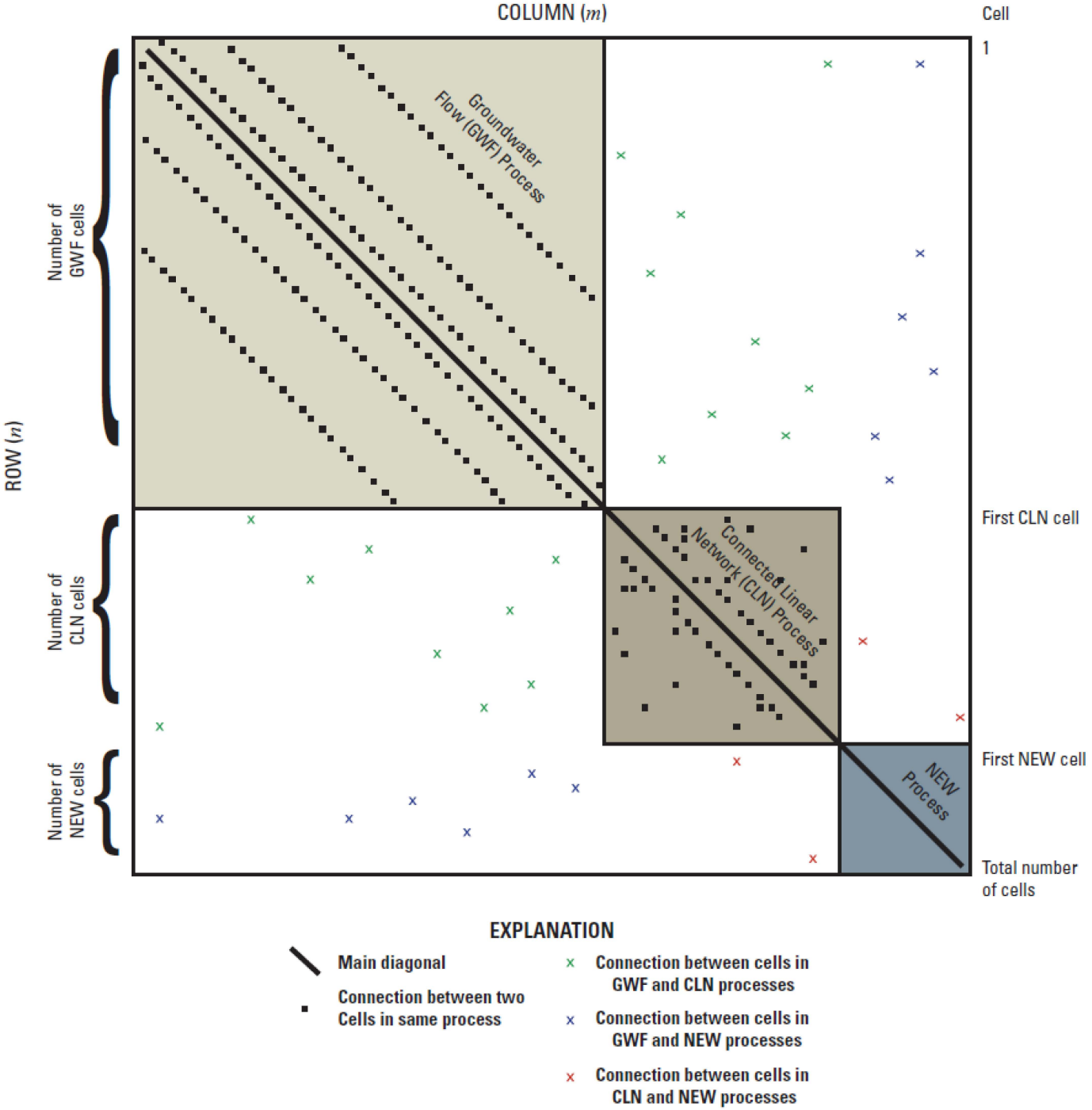
Use of Connected Linear Network (CLN) and Well (WEL) Packages for Pumping


CLN segment
CLN1
GWF1
20 m
Layer 1
Q = C (hGWF1 - b1)
Q
hGWF1
dry
b1
0 m
GWF2
Layer 2
-5 m
CLN2
GWF3
Layer 3
Pump located in CLN2
-35 m

Failure to Converge

Failure to Converge

3+ hours

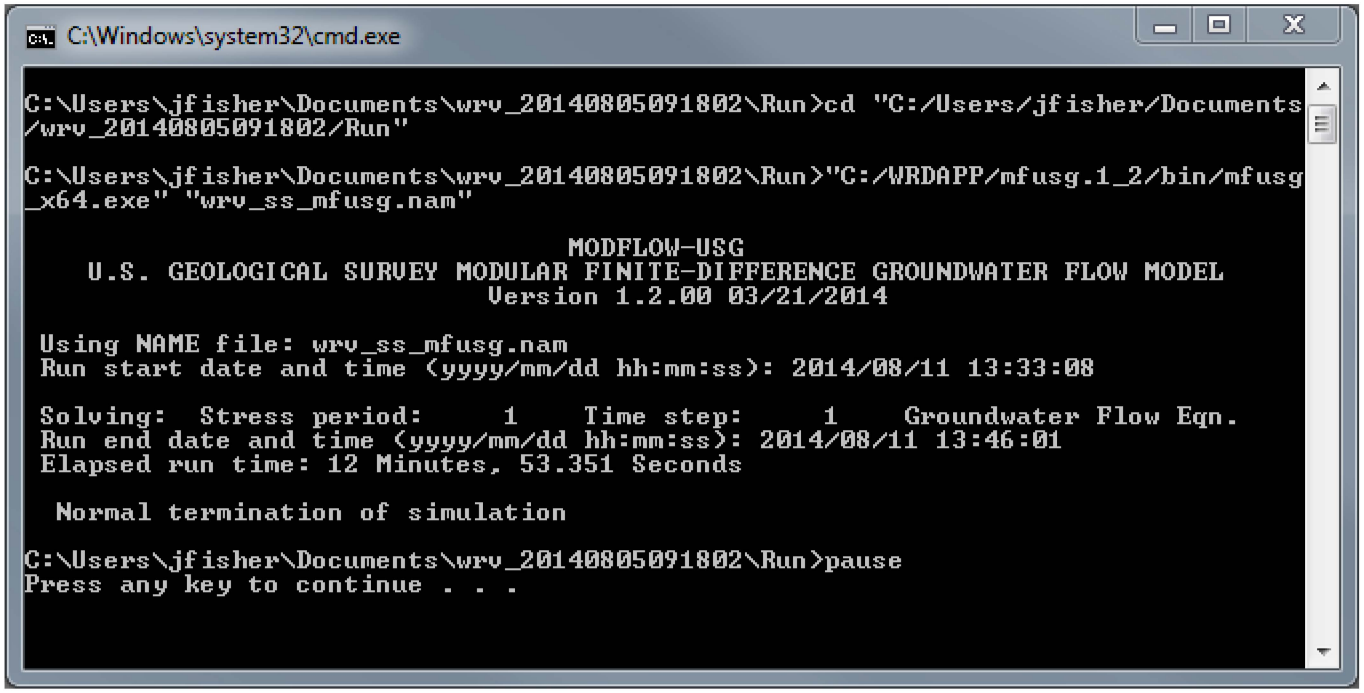

COLUMN (m)
Cell
1
ROW (n)
Number of GWF cells
Groundwater Flow (GWF) Process
First CLN cell
Number of CLN cells
Connected Linear Network (CLN) Process
First NEW cell
Number of NEW cells
NEW Process
Total number of cells
EXPLANATION
Main diagonal
Connection between two Cells in same process
Connection between cells in GWF and CLN processes
Connection between cells in GWF and NEW processes
Connection between cells in CLN and NEW processes

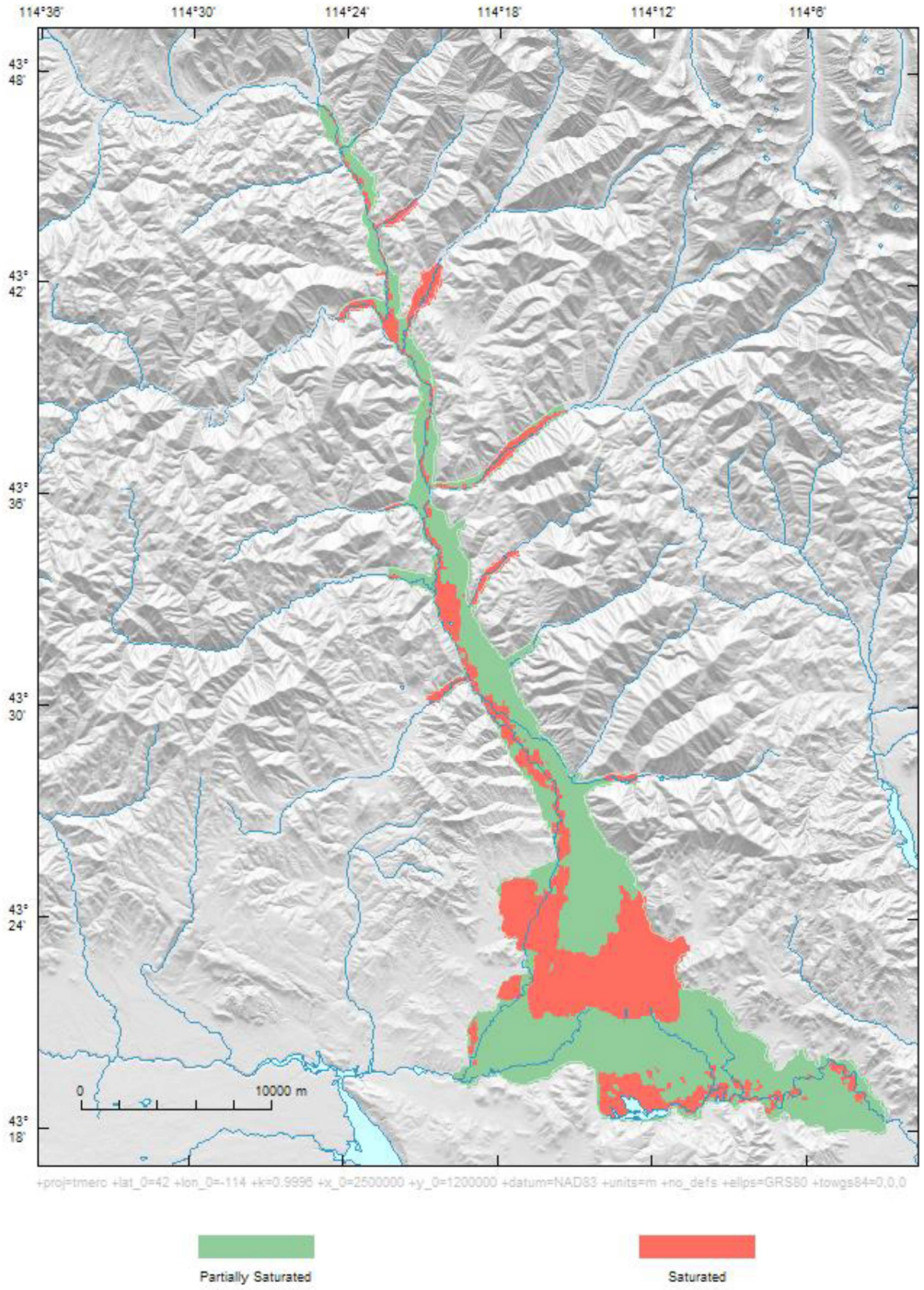
The Well (WEL) Package is Now Used to Simulate Pumping

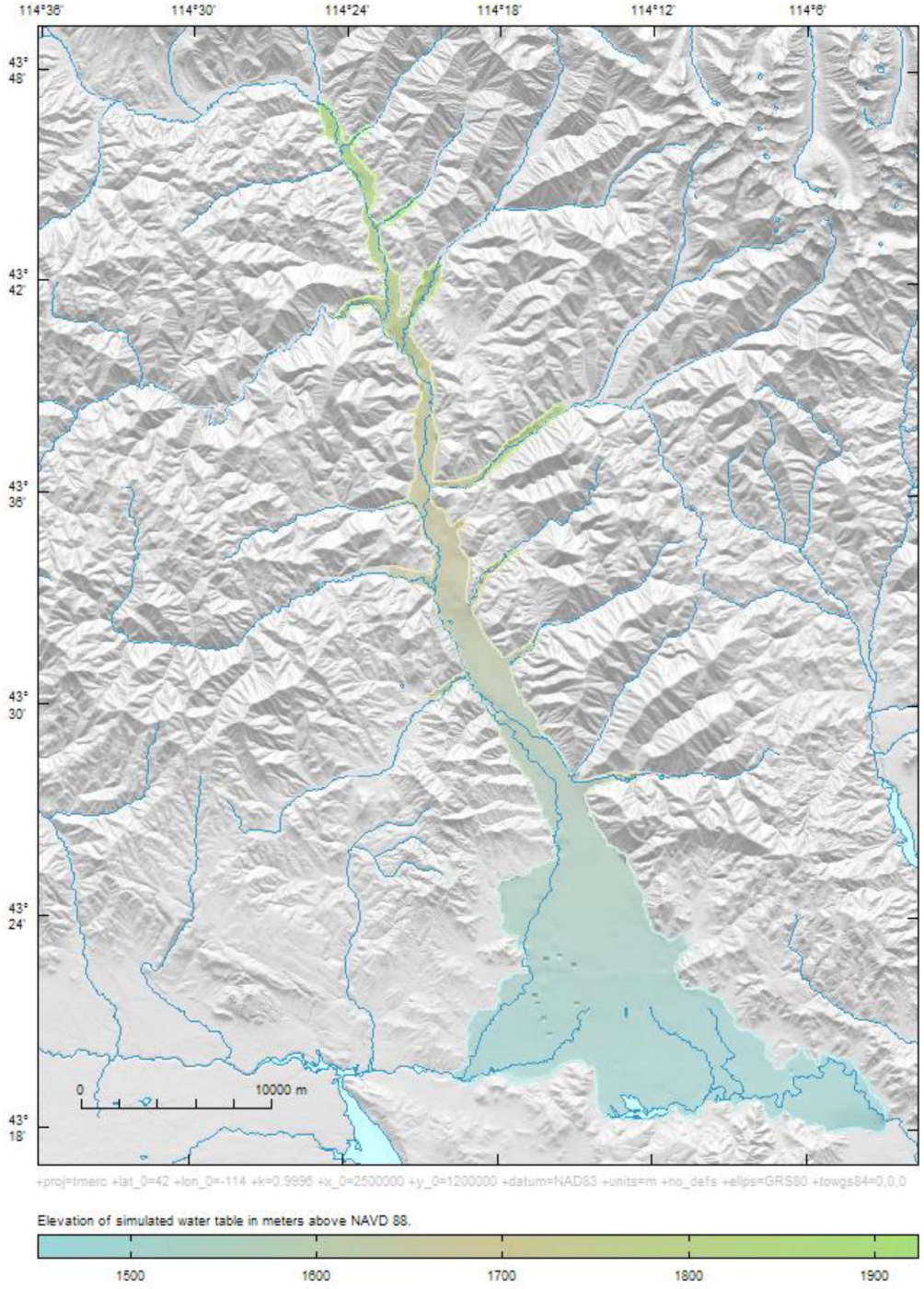
The Well (WEL) Package is Now Used to Simulate Pumping

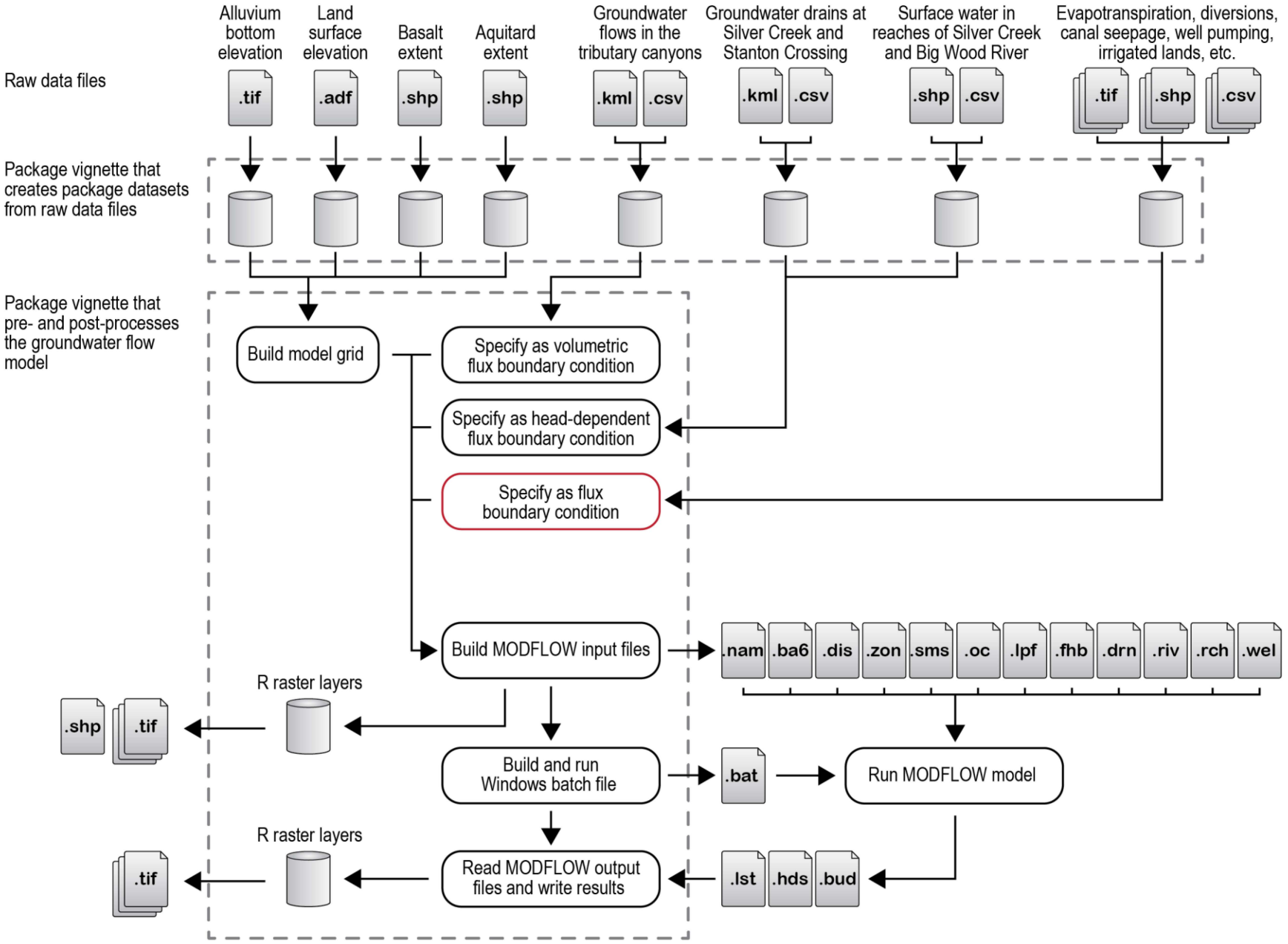
Assumption: pumped groundwater from a well is simulated as discharge from the lowest model cell in contact with the wells open interval.

Steady-State Conditions with All Aquifer Components




114°36'
114°30'
114°24'
114°18'
114°12'
114°6'
43° 48'
43° 42'
43° 36'
43° 30'
43° 24'
43° 18'
0
10000 m
+proj=tmerc +lat_0=42 +lon_0=-114 +k=0.9996 +x_0=2500000 +y_0=1200000 +datum=NAD83 +units=m +no_defs +ellps=GRS80 +towgs84=0,0,0
Partially Saturated
Saturated


114°36'
114°30'
114°24'
114°18'
114°12'
114°6'
43° 48'
43° 42'
43° 36'
43° 30'
43° 24'
43° 18'
0
10000 m
+proj=tmerc +lat_0=42 +lon_0=-114 +k=0.9996 +x_0=2500000 +y_0=1200000 +datum=NAD83 +units=m +no_defs +ellps=GRS80 +towgs84=0,0,0
Elevation of simulated water table in meters above NAVD 88.
1500
1600
1700
1800
1900


Alluvium bottom elevation
Land surface elevation
Basalt extent
Aquitard extent
Groundwater flows in the tributary canyons
Groundwater drains at Silver Creek and Stanton Crossing
Surface water in reaches of Silver Creek and Big Wood River
Evapotranspiration, diversions, canal seepage, well pumping, irrigated lands, etc.
Raw data files
.tif
.adf
.shp
.shp
.kml
.csv
.kml
.csv
.shp
.csv
.tif
.shp
.csv
Package vignette that creates package datasets from raw data files
Package vignette that pre- and post-processes the groundwater flow model
Build model grid
Specify as volumetric flux boundary condition
Specify as head-dependent flux boundary condition
Specify as flux boundary condition
Build MODFLOW input files
.nam
.ba6
.dis
.zon
.sms
.oc
.lpf
.fhb
.drn
.riv
.rch
.wel
R raster layers
.shp
.tif
Build and run Windows batch file
.bat
Run MODFLOW model
R raster layers
.tif
Read MODFLOW output files and write results
.lst
.hds
.bud

Package 'wrv'

August 11, 2014

Version 0.1-5

Date 2014-07-28

Title Wood River Valley Groundwater Flow Model

Author Jason C. Fisher

Maintainer Jason C. Fisher <jfisher@usgs.gov>

Depends R (>= 3.1.0), sp, rgdal, rgeos, raster

Imports igraph

Suggests RCurl, knitr, xtable, png

SystemRequirements MODFLOW-USG (>= 1.2)

Description Pre- and post-processing program for the groundwater-flow model of the Wood River Valley aquifer system, south-central Idaho.

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URL https://github.com/jfisher-usgs/wrv

BugReports https://github.com/jfisher-usgs/wrv/issues

ByteCompile yes

LazyData yes

VignetteBuilder knitr

R topics documented:

Questions

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