



Flood Modelling Quality Control

Chris Huxley



Today's Presentation Overview

Potential sources of quality issues?

1. The quality of input data
2. The modellers interpretation and implementation of input data
3. Model design
4. Model simulation health
5. Software suitability
6. Project structure



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Potential sources of quality issues

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Severity	Issue Description			Modeller:							
1	NO ISSUE - Likely to have only a minor impact on results and is somewhat subjective - Consider fixing if model is being re-run for other reasons										
2	MINOR ISSUE - Likely to have some impact on results (local or wider) - Strongly recommend fixing (definitely fix if re-running for other reasons)										
3	MODERATE ISSUE - An error or omission that will noticeably affect results (local or wider) - Must be fixed										
4	MAJOR ISSUE - An error or omission that will noticeably affect results (local or wider) - Must be fixed										
				<p>Note: Add/delete items as needed. The reporting level of detail should reflect the complexity of the modelling project</p>							
Item ID	Review Item	Modeller Comment (Optional Clarification for Reviewer)	Is current setup appropriate? (Yes, No, N/A, Not Reviewed)	Severity of Issue (1, 2, 3, 4)	Reviewer Comment	Modeller Response	Review Sign Off (Resolved, Unresolved, N/A)				
Results											
59	If using TUFLOW Classic, is Map Output Data Types == MB1 MB2 specified for review of mass balance problem locations? Are there any Mass balance issues that need to be resolved?										
60	If using TUFLOW HPC, is Map Output Data Types == dt specified for review of minimum timestep location for the simulator? Is the location of minimum dt logical based on the dominant control number (courant = velocity control, celerity = depth control or diffusion number = small cell size / velocity shear)?										
61	If using TUFLOW HPC, are there any topographic or boundary condition input definition errors which correlate to the location of minimum timestep?										
62	Have 2d_po_Q type lines been defined downstream from major 2d_bc QT boundaries to confirm stability of inflow boundaries?										

Stay online to the end of the webinar to receive a download link for a TUFLOW modelling log, data review and model peer review checklist spreadsheet

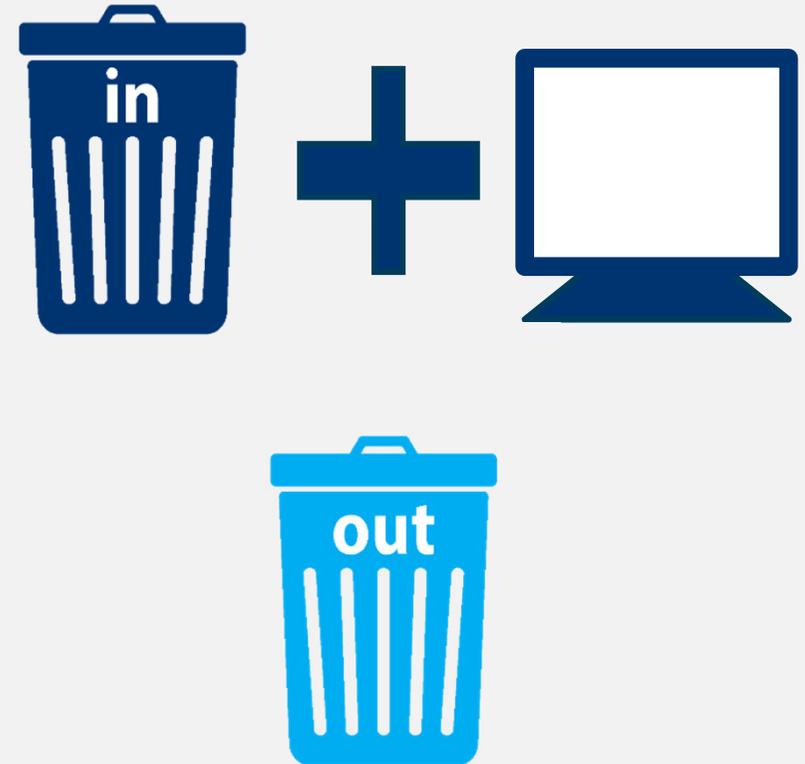
Flood Modelling Quality Control

Data Quality

Data Quality

It is the Modeller's responsibility to critically review **ALL** data before use

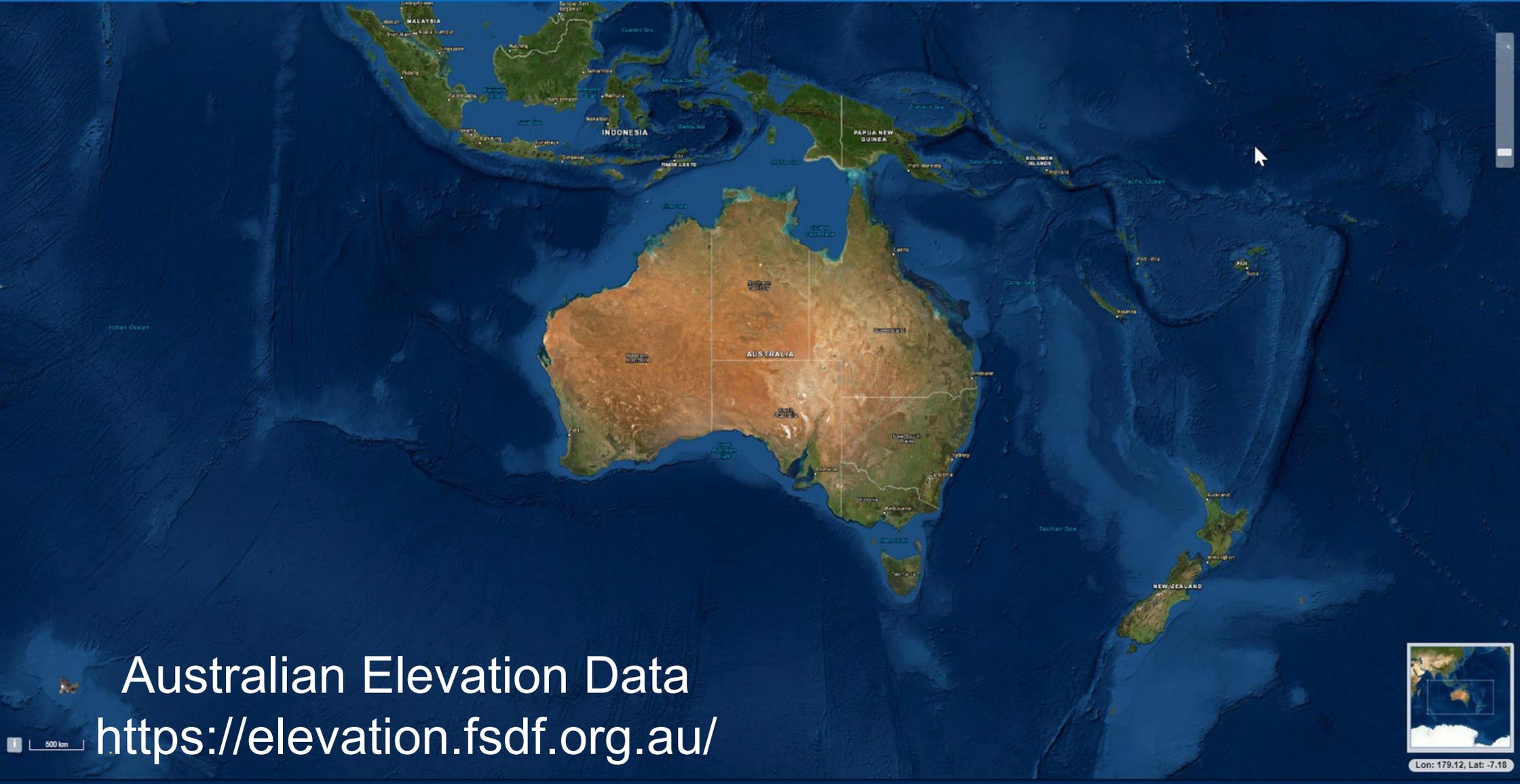
- Identify inaccuracies before use in a hydraulic model is the most efficient workflow
- Create a standardised checklist to guide data review
- Familiarity with the subject location is extremely important!



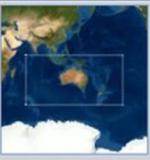
Data Quality Review Example

DEM Topography Data Checklist:

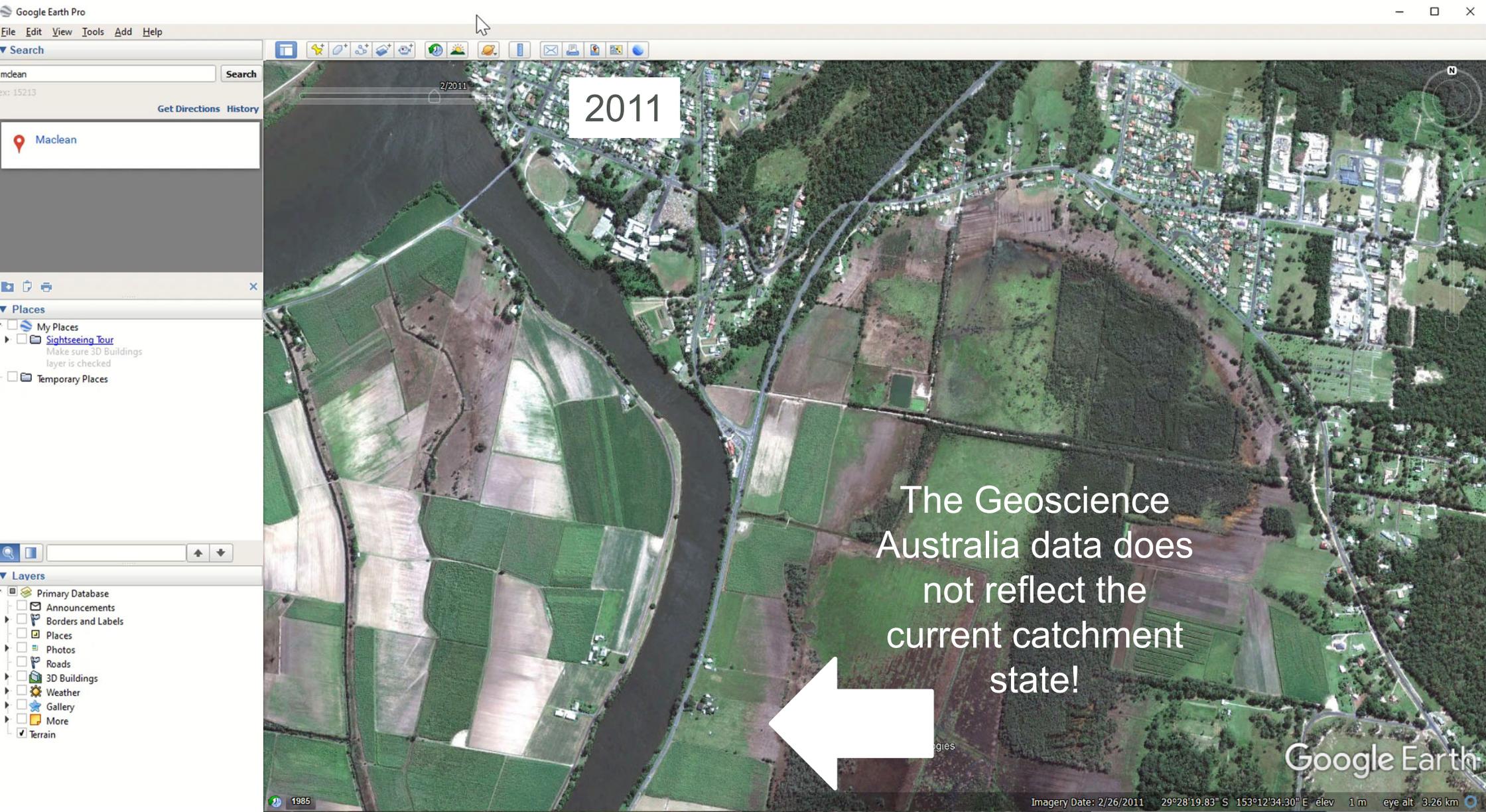
1. Data resolution (relative to desired flood model resolution)
2. Data inclusion / exclusion (e.g. bathymetry, bridge decks?)
3. Projection (horizontal datum): AGD84 vs GDA94 vs GDA2020?
4. Vertical datum (local datum, mAHD, LAT, ...?)
5. The date of capture



Australian Elevation Data
<https://elevation.fsdf.org.au/>



Lon: 179.12, Lat: -7.18



2011

The Geoscience Australia data does not reflect the current catchment state!



Google Earth Pro

File Edit View Tools Add Help

Search

Maclean

Get Directions History

Places

- My Places
- Sightseeing Tour
- Temporary Places

Layers

- Primary Database
- Announcements
- Borders and Labels
- Places
- Photos
- Roads
- 3D Buildings
- Weather
- Gallery
- More
- Terrain

Data Quality Review Elevation Data Update

TUFLOW Geometry Control

```
Read GIS Location == gis\2d_loc_AWS_L.shp
GRID SIZE (X,Y) == 2000,2100
CELL SIZE == 1

! Active / Inactive Areas
Set CODE == 1
Read GIS Code == gis\2d_code_example_001.shp

! Topography / Elevations
Set Zpt == 100
Read GRID Zpts == DEM\DEM_20100425_MCL_1m_001.flt
Read GRID Zpts == DEM\DEM_20120604_CLA_River_2m_001.flt
```



Data Quality Review Elevation Data Update



TUFLOW Geometry Control

```
Read GIS Location == gis\2d_loc_AWS_L.shp
GRID SIZE (X,Y) == 2000,2100
CELL SIZE == 1

! Active / Inactive Areas
Set CODE == 1
Read GIS Code == gis\2d_code_example_001.shp

! Topography / Elevations
Set Zpt == 100
Read GRID Zpts == DEM\DEM_20100425_MCL_1m_001.flt
Read GRID Zpts == DEM\DEM_20120604_CLA_River_2m_001.flt

Create TIN Zpts == gis\2d_zsh_PacHwy2022_003_R.shp | gis\2d_zsh_PacHwy2022_003_L.shp | gis\2d_zsh_PacHwy2022_003_P.shp
```



Data Quality Review Elevation Data Update

TUFLOW Geometry Control

```
Read GIS Location == gis\2d_loc_AWS_L.shp
GRID SIZE (X,Y) == 2000,2100
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! Active / Inactive Areas
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! Topography / Elevations
Set Zpt == 100
Read GRID Zpts == DEM\DEM_20100425_MCL_1m_001.flt
Read GRID Zpts == DEM\DEM_20120604_CLA_River_2m_001.flt

Create TIN Zpts == gis\2d_zsh_PacHwy2022_003_R.shp | gi
```

“Read TIN Zpts” command can
also read 12D or xml TINs
directly



<https://wiki.tuflow.com/>



TUFLOW Wiki Homepage



This Wiki contains information relating to the flood and coastal simulation software TUFLOW Classic and TUFLOW HPC (Heavily Parallelised Compute). It is designed to be used in conjunction with the TUFLOW [Manual](#) and [Website](#)

TUFLOW Set-up and use

TUFLOW

- How to install TUFLOW
- How to configure a licence
- How to build a TUFLOW model (tutorials)
- How to run a TUFLOW model
- Free pre/post-processing utilities
- Result Viewing - TUFLOW Viewer



TUFLOW Benchmarks

- TUFLOW Solution Accuracy Benchmarks
- Computer Hardware Speed Benchmarks

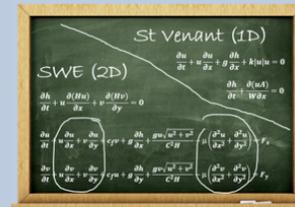
Best Practice Guidance

- Webinar Recordings
- TUFLOW Modelling Guidance

HPC Tutorial Models

- Tutorial Model Introduction
- Module 1 - 2D Base Model
- Module 2 - Topography Updates
- Module 3 - 1D Culverts
- Module 4 - 2D Bridges
- Module 5 - Integrated Urban Drainage
- Module 6 - Direct Rainfall
- Module 7 - Quadtree
- Module 8 - Scenario Management
- Module 9 - Event Management
- Module 10 - Dam Break
- Module 11 - 1D Open Channel

**NEW
for 2022**



- Flood Modeller Introduction
- FM Module 1 (Linking Flood Modeller to TUFLOW)
- FM Module 2 (Linking Flood Modeller to ESTRY)

TUFLOW Troubleshooting

Error/Warning Message Database

- About This Database
- 0xxx TUFLOW Messages
- 1xxx TUFLOW Messages
- 2xxx TUFLOW Messages
- 3xxx TUFLOW Messages
- 9xxx TUFLOW Messages

- TUFLOW Check Files
- support@tuflow.com

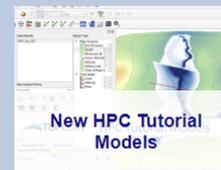


Downloads



FREE

Recent Wiki Updates / New Content (click image to view)

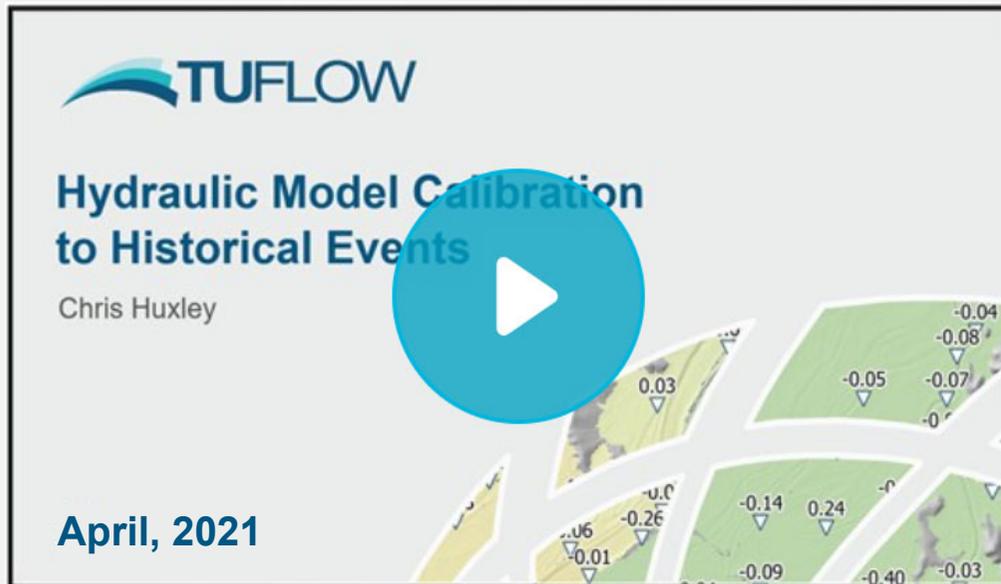


Data Quality Review Checklist

	A	B	C	D	E	F	G	H
			Input 1	Input 2	Input 3	Input 4	Input 5	Input 6
1								
2	Topography (DEM)	Filename						
3		Data source						
4		Data resolution						
5		Projection (horizontal datum)						
6		Vertical datum						
7		Date of capture						
8		Data inclusion / exclusion (e.g. bathymetry, bridge decks?)						
9		Additional comments						
10	Reviewer initials							
11								
12	Topography (Survey)	Filename						
13		Data source						
14		Projection (horizontal datum)						
15		Vertical datum						
16		Date of capture						
17		Data inclusion / exclusion						
18		Additional comments						
19		Reviewer initials						
20								
21	Landuse Data	Filename						
22		Data source						
23		Projection (horizontal datum)						
24		Date of capture						
25		Data inclusion / exclusion (e.g. grouping of landuse types?)						
26		Do Manning's n values reflect industry standard values						
27		Site visit / google street view confirmation?						
28		Additional comments						
29	Reviewer initials							
30								
31	Structure Data	Filename						
32		Data source						
33		Projection (horizontal datum)						
34		Vertical datum						
35		Date of capture						
36		Data inclusion / exclusion (e.g. pipes less than Xmm diameter)						
37		Additional comments						
38		Reviewer initials						
39								
40	Bridge Data	Filename						
41		Data source						
42		Projection (horizontal datum)						
43		Vertical datum						
44		Date of capture						
45		Data inclusion / exclusion						
46		Additional comments						
47		Reviewer initials						
48								
49	Recorded Calibration Data	Filename						
50		Data source						
51		Projection (horizontal datum)						
52		Vertical datum						
53		Date of capture						
54		Data inclusion / exclusion						
55		Additional comments						
56		Reviewer initials						
57								
58		Filename						

TUFLOW modelling log, data review and model peer review checklist spreadsheet

Other TUFLOW AWS Webinars Focusing on Input Data Quality Review?



TUFLOW

Hydraulic Model Calibration to Historical Events

Chris Huxley

April, 2021



TUFLOW **aws** Australian Water School

Pipe Network Modelling for Urban Inundation

Bill Syme and Chris Huxley

Feb, 2022

<https://www.tuflow.com/library/webinars/>

Flood Modelling Quality Control

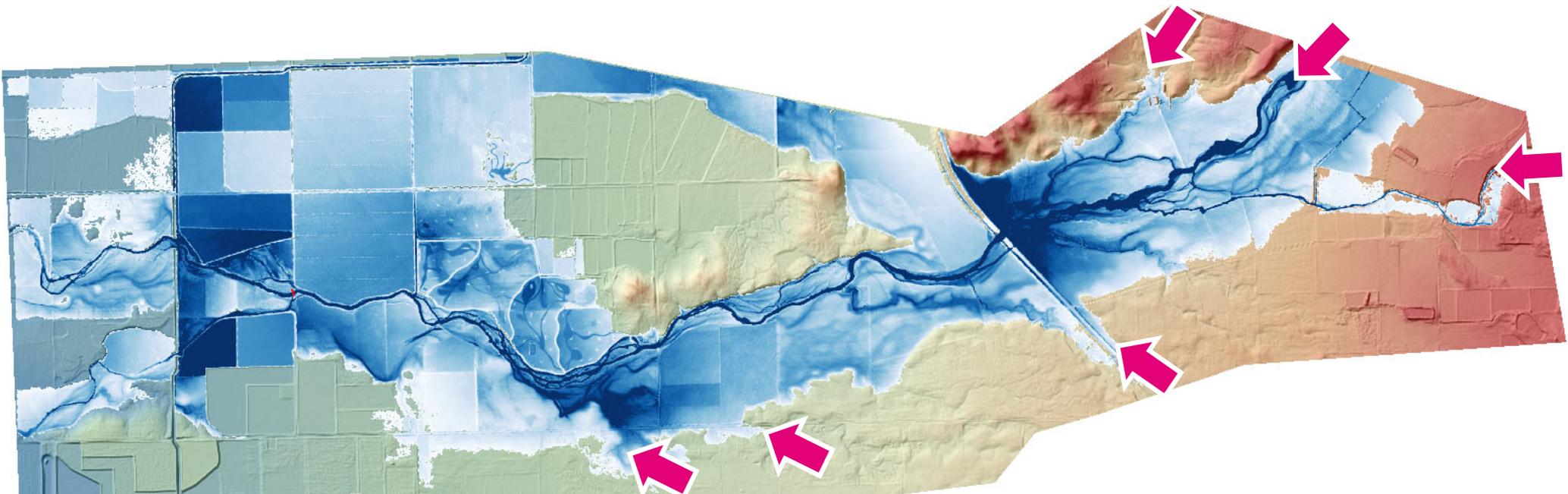
Model Build

Hydraulic Model Build Fundamentals

Boundary Condition Inputs

- Hydrology model review (extent, model design, inputs, outputs)
- Hydrology >> hydraulic model data transfer
- Boundary condition definition
- etc.

Don't Assume!
Check



Hydraulic Model Build Fundamentals

Model Geometry

- Definition of main hydraulic controls and conveyance features
- Appropriate object delineation
- Industry standard parameters
- etc.



Hydraulic Model Build Fundamentals

Model Geometry

- Definition of main hydraulic controls
- Appropriate object delineation
- Industry standard parameters
- etc.



Hydraulic Model Calibration to Historical Events

Chris Huxley

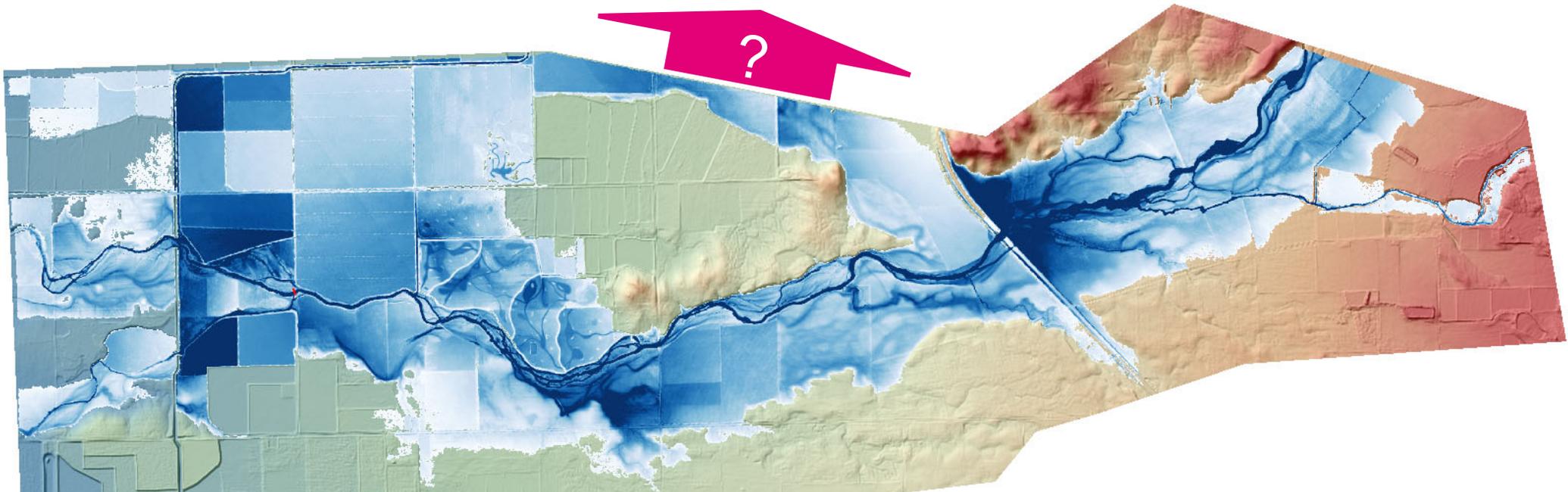


<https://www.tuflow.com/library/webinars/>

Hydraulic Model Build Fundamentals

Model Design

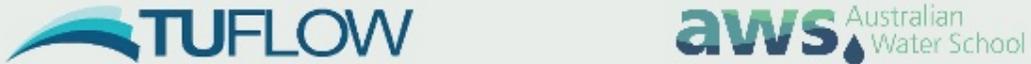
- Domain extent
- Buffer between external model boundaries and area of interest
- Appropriate 2D cell size (result convergence?)
- Model features relative to cell size
- etc.



Hydraulic Model Build Fundamentals

Model Design

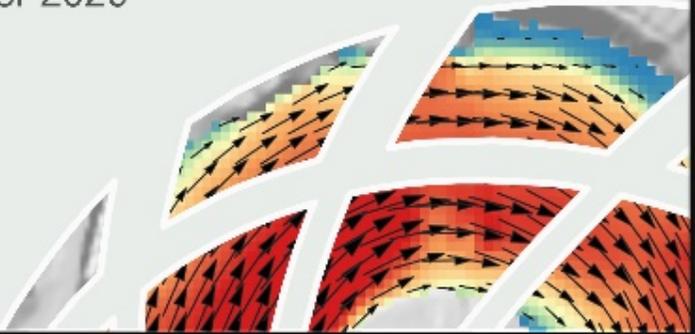
- Domain extent
- Buffer between external model boundaries
- Appropriate 2D cell size (result convergence)
- Model features relative to cell size
- etc.



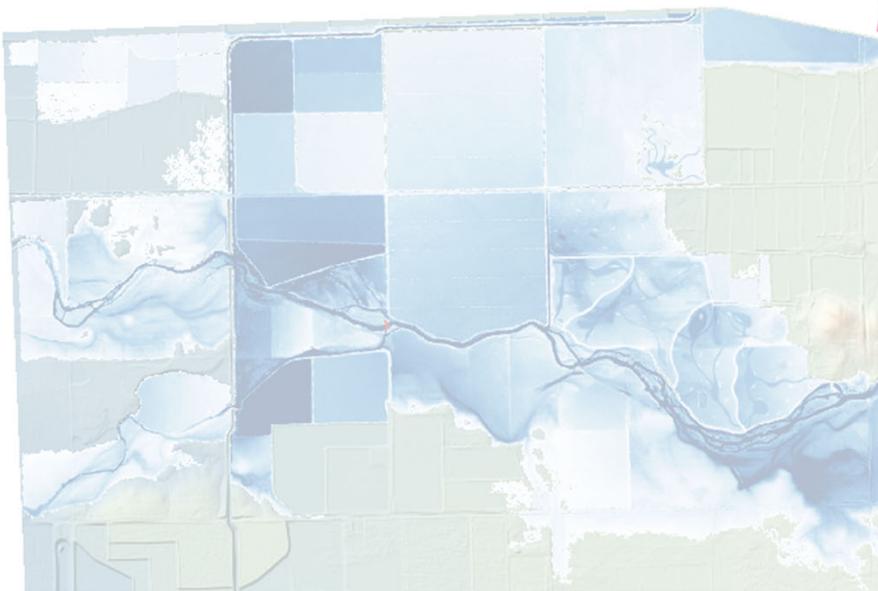
TUFLOW **aws** Australian Water School

Learn the Importance of 2D Cell Size Assumptions for Accurate Hydraulic Modelling

Webinar: 18th November 2020



<https://www.tuflow.com/library/webinars/>



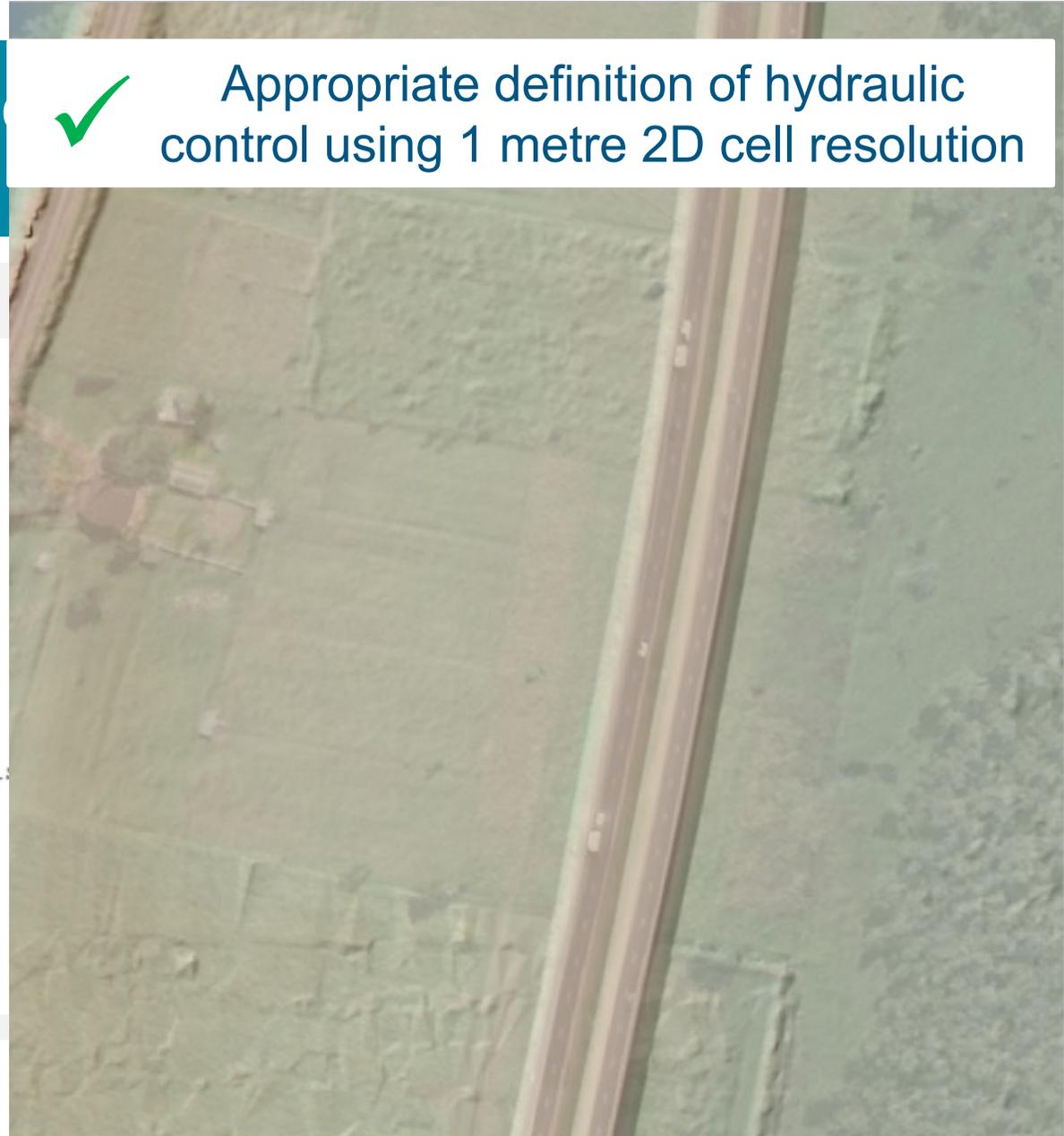
Hydraulic Model Build Function Model Design Example



Appropriate definition of hydraulic control using 1 metre 2D cell resolution

TUFLOW Geometry Control

```
Read GIS Location == gis\2d_loc_AWS_L.shp
GRID SIZE (X,Y) == 2000,2100
CELL SIZE == 1
! Active / Inactive Areas
Set CODE == 1
Read GIS Code == gis\2d_code_example_001.shp
! Topography / Elevations
Set Zpt == 100
Read GRID Zpts == DEM\DEM_20100425_MCL_1m_001.flt
Read GRID Zpts == DEM\DEM_20120604_CLA_River_2m_001.flt
Create TIN Zpts == gis\2d_zsh_PacHwy2022_003_R.shp | gis
```



Hydraulic Model Build Function Model Design Example

x Inappropriate definition of hydraulic control using 20 metre 2D cell resolution

TUFLOW Geometry Control

```
Read GIS Location == gis\2d_loc_AWS_L.shp
GRID SIZE (X,Y) == 2000,2100
CELL SIZE == 20 ←
! Active / Inactive Areas
Set CODE == 1
Read GIS Code == gis\2d_code_example_001.shp
! Topography / Elevations
Set Zpt == 100
Read GRID Zpts == DEM\DEM_20100425_MCL_1m_001.flt
Read GRID Zpts == DEM\DEM_20120604_CLA_River_2m_001.flt
Create TIN Zpts == gis\2d_zsh_PacHwy2022_003_R.shp | gi
```

Hydraulic Model Build Function Model Design Example

TUFLOW Geometry Control

```
Read GIS Location == gis\2d_loc_AWS_L.shp
GRID SIZE (X,Y) == 2000,2100
CELL SIZE == 20

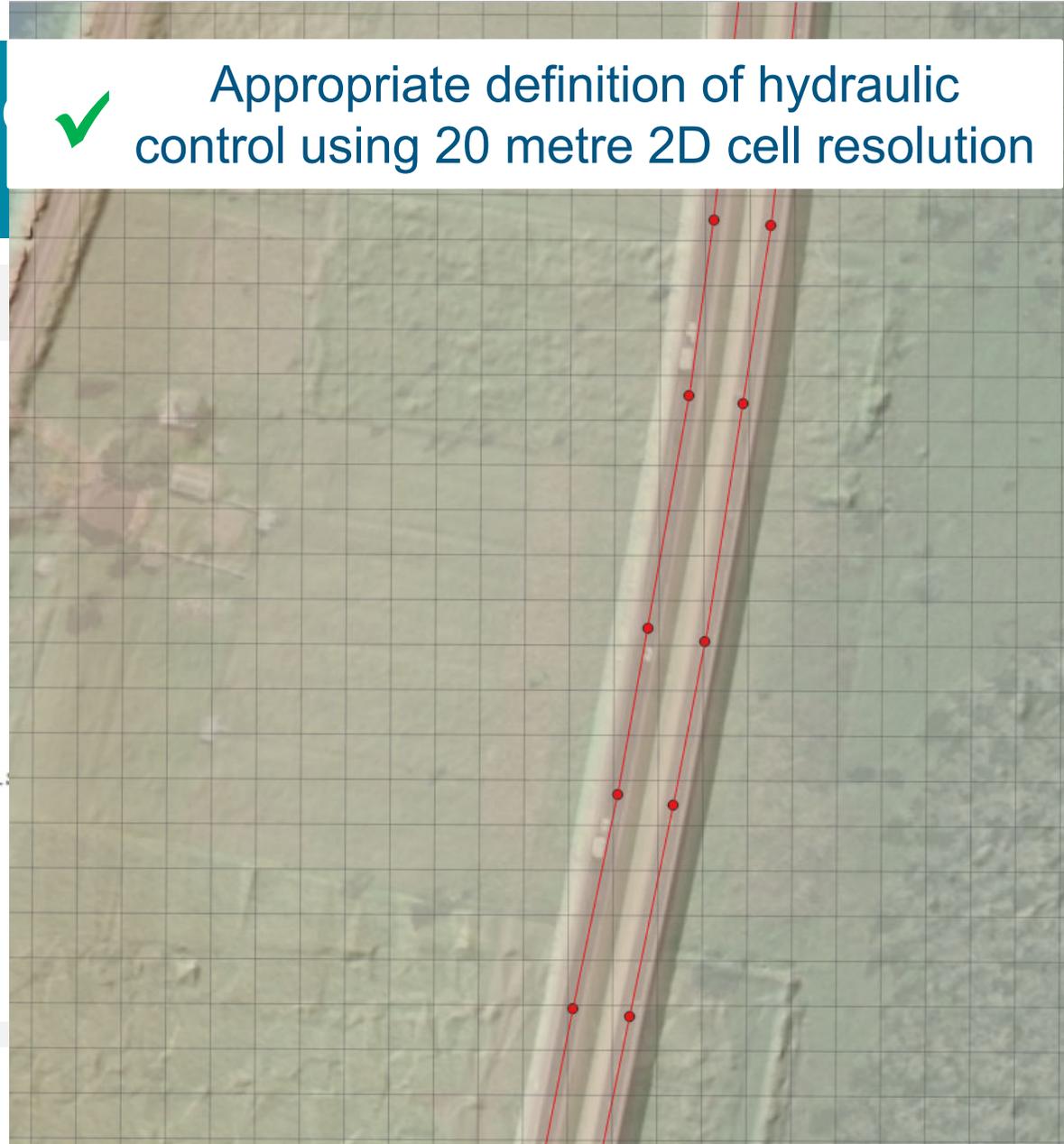
! Active / Inactive Areas
Set CODE == 1
Read GIS Code == gis\2d_code_example_001.shp

! Topography / Elevations
Set Zpt == 100
Read GRID Zpts == DEM\DEM_20100425_MCL_1m_001.flt
Read GRID Zpts == DEM\DEM_20120604_CLA_River_2m_001.flt

Create TIN Zpts == gis\2d_zsh_PacHwy2022_003_R.shp | gis
Read GIS Z Shape == gis\2d_zsh_PacHwy2022_CL_003_L.shp | gis
```



Appropriate definition of hydraulic control using 20 metre 2D cell resolution



Hydraulic Model Build Fun Model Design Example

TUFLOW Geometry Control

```
Read GIS Location == gis\2d_loc_AWS_L.shp
GRID SIZE (X,Y) == 2000,2100
CELL SIZE == 20

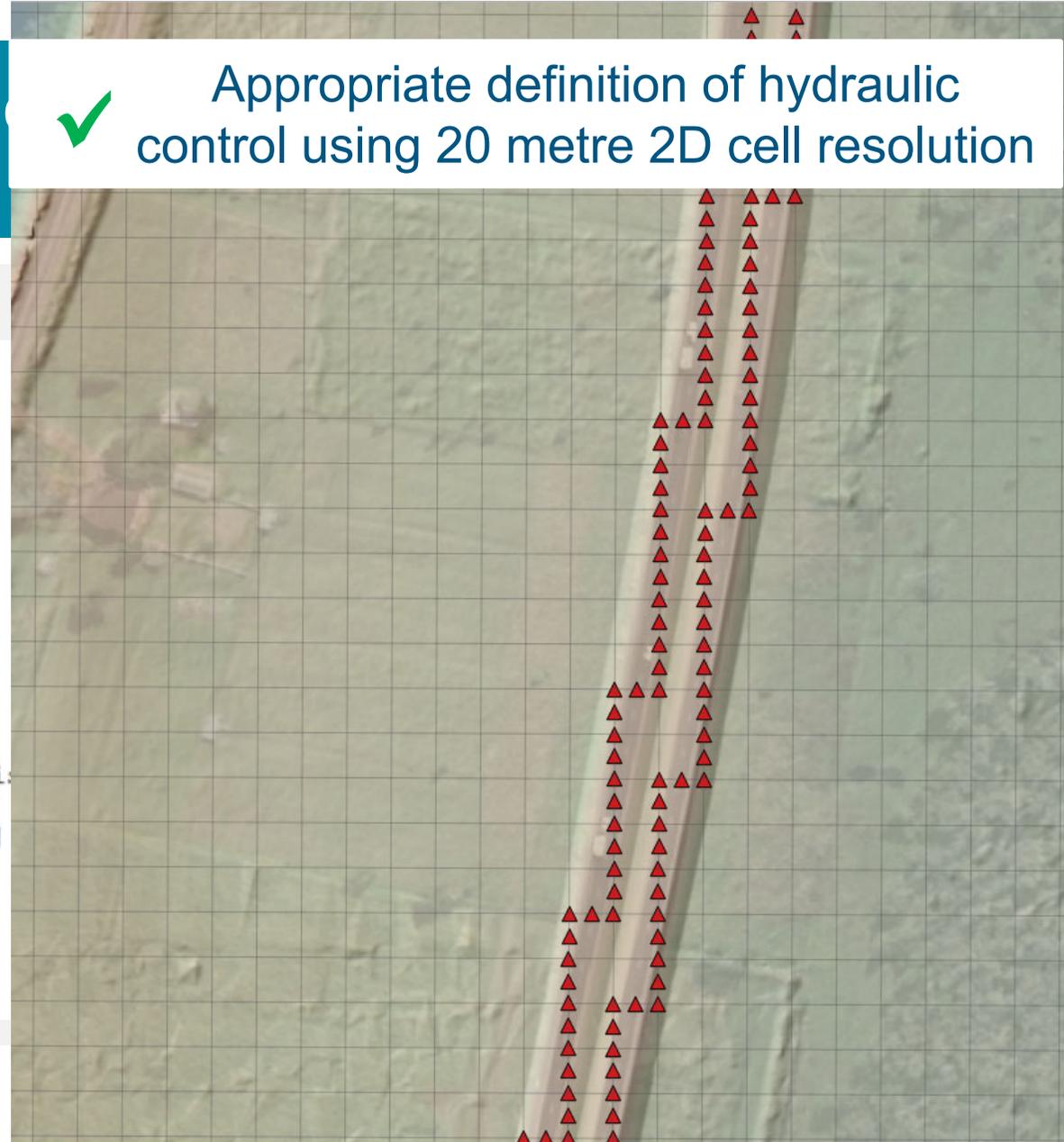
! Active / Inactive Areas
Set CODE == 1
Read GIS Code == gis\2d_code_example_001.shp

! Topography / Elevations
Set Zpt == 100
Read GRID Zpts == DEM\DEM_20100425_MCL_1m_001.flt
Read GRID Zpts == DEM\DEM_20120604_CLA_River_2m_001.flt

Create TIN Zpts == gis\2d_zsh_PacHwy2022_003_R.shp | gis
Read GIS Z Shape == gis\2d_zsh_PacHwy2022_CL_003_L.shp | gis
```



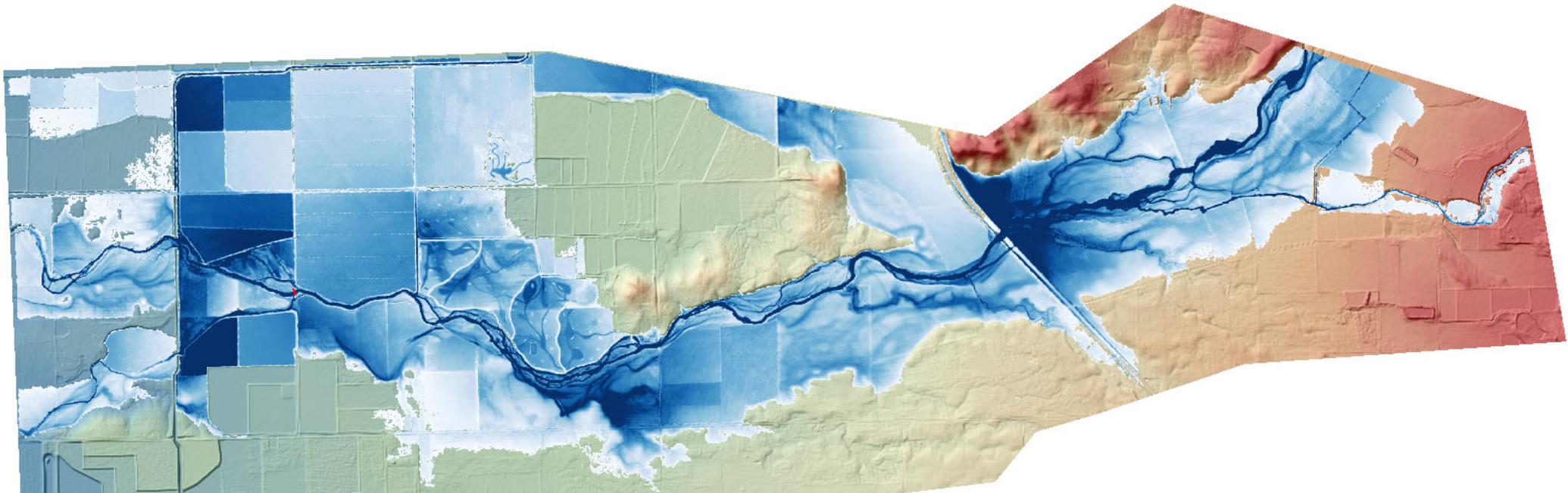
Appropriate definition of hydraulic control using 20 metre 2D cell resolution



Hydraulic Model Build Fundamentals Results

1. Results

- Calibration to multiple historic events
- Common sense checks
- ARR2019 event selection compliance
- etc.



Hydraulic Model Build Fundamentals

Model and Project Structure

Formalise project structure before starting your modelling:

- The expected design of your model
- File / folder structure
- Naming conventions

TUFLOW has a new compact GIS database format available in the 2022 release



Clean your room!

GeoPackage

What is it?

“The GeoPackage Encoding Standard describes a set of conventions for storing the following within an SQLite database:

- vector features*
- tile matrix sets of imagery and raster maps at various scales*
- attributes (non-spatial data)*
- extensions”*

www.geopackage.org



GeoPackage

What does it look like?

Pre-2022 standard: SHP or MIF/MID format

Name	Date modified	Type
empty	1/09/2022 5:41 PM	File folder
1d_nwk_000_L.dbf	1/09/2022 5:40 PM	DBF File
1d_nwk_000_L.prj	1/09/2022 5:40 PM	Text Document
1d_nwk_000_L.shp	1/09/2022 5:40 PM	SHP File
1d_nwk_000_L.shx	1/09/2022 5:40 PM	SHX File
1d_nwk_001_L.cpg	1/09/2022 5:40 PM	CPG File
1d_nwk_001_L.dbf	1/09/2022 5:40 PM	DBF File
1d_nwk_001_L.prj	1/09/2022 5:40 PM	Text Document
1d_nwk_001_L.shp	1/09/2022 5:40 PM	SHP File
1d_nwk_001_L.shx	1/09/2022 5:40 PM	SHX File
1d_nwk_006_L.dbf	1/09/2022 5:40 PM	DBF File
1d_nwk_006_L.prj	1/09/2022 5:40 PM	Text Document
1d_nwk_006_L.shp	1/09/2022 5:40 PM	SHP File
1d_nwk_006_L.shx	1/09/2022 5:40 PM	SHX File
2d_bc_000_P.dbf	1/09/2022 5:40 PM	DBF File
2d_bc_000_P.prj	1/09/2022 5:40 PM	Text Document
2d_bc_000_P.shp	1/09/2022 5:40 PM	SHP File
2d_bc_000_P.shx	1/09/2022 5:40 PM	SHX File
2d_bc_001_P.cpg	1/09/2022 5:40 PM	CPG File
2d_bc_001_P.dbf	1/09/2022 5:40 PM	DBF File
2d_bc_001_P.prj	1/09/2022 5:40 PM	Text Document
2d_bc_001_P.shp	1/09/2022 5:40 PM	SHP File
2d_bc_001_P.shx	1/09/2022 5:40 PM	SHX File
2d_bc_005_L.cpg	1/09/2022 5:40 PM	CPG File

Post 2022 option – GeoPackage format

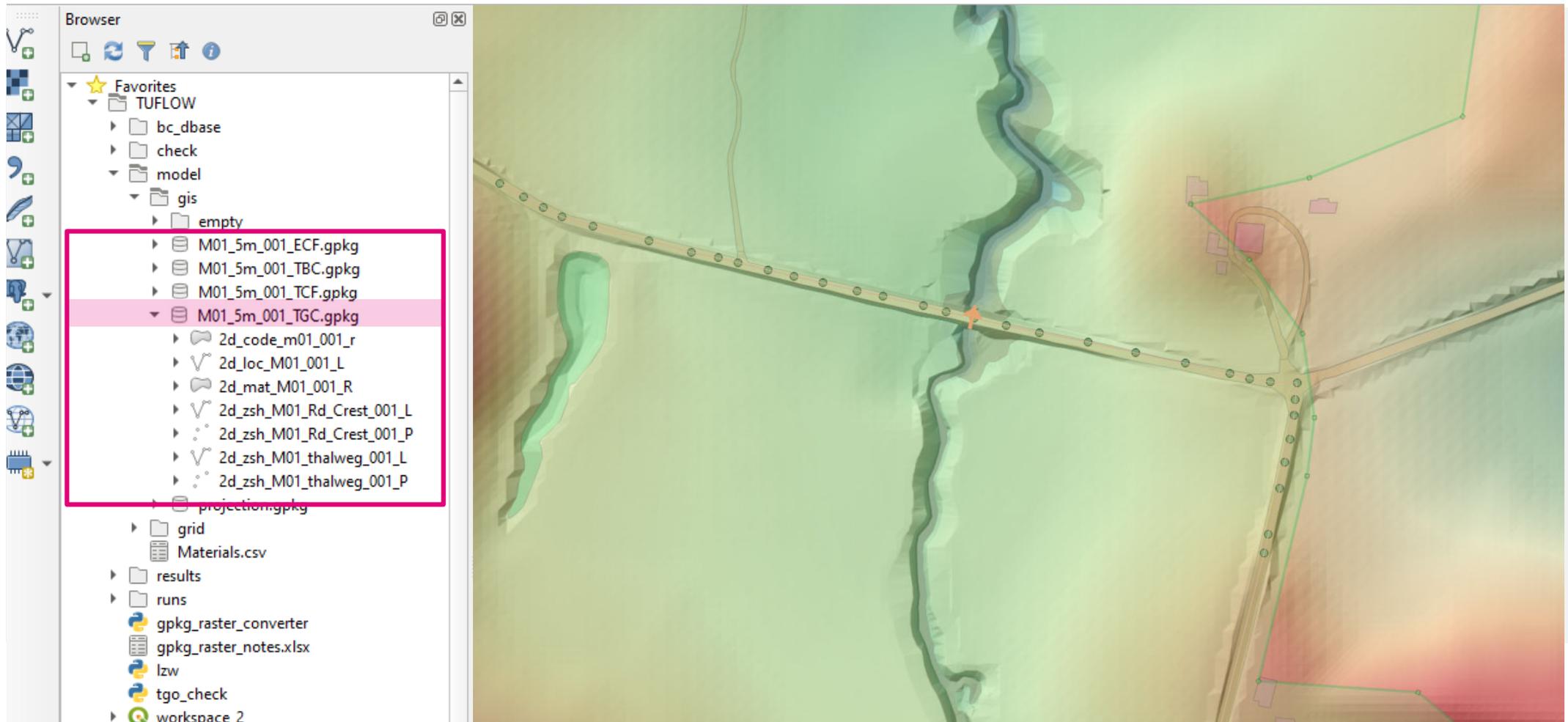
Name	Date modified	Type
gis		File folder
grid		File folder
nc		File folder
xs		File folder
empty		File folder
M01_5m_001_ECF.gpkg		GeoPackage File
M01_5m_001_TBC.gpkg		GeoPackage File
M01_5m_001_TCF.gpkg		GeoPackage File
M01_5m_001_TGC.gpkg		GeoPackage File
projection.gpkg		GeoPackage File

The user can group objects within a gpkg however desired

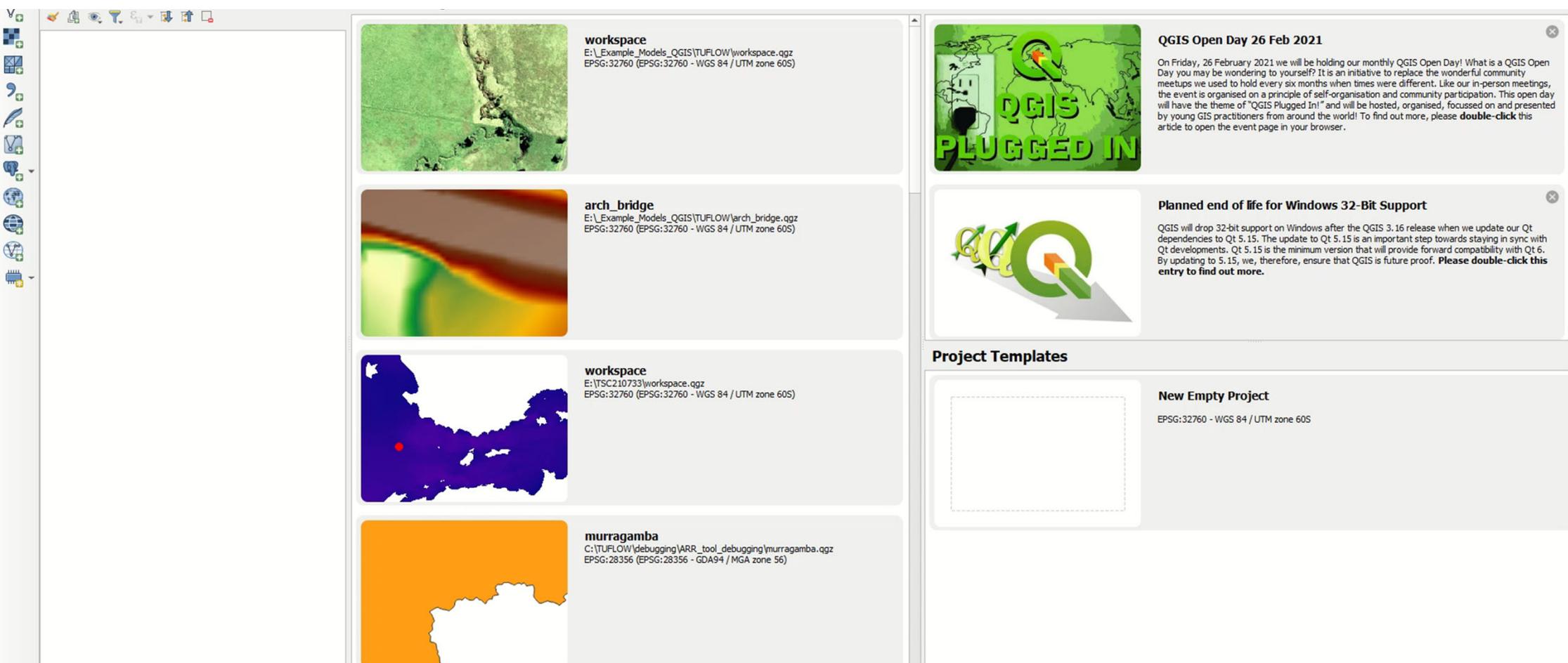
e.g., control file, historic catchment state, proposed development scenario etc.

GeoPackage

How are the files displayed in QGIS?



GeoPackage is spatially Indexed – this means loading, rendering, querying, selecting and editing is quicker



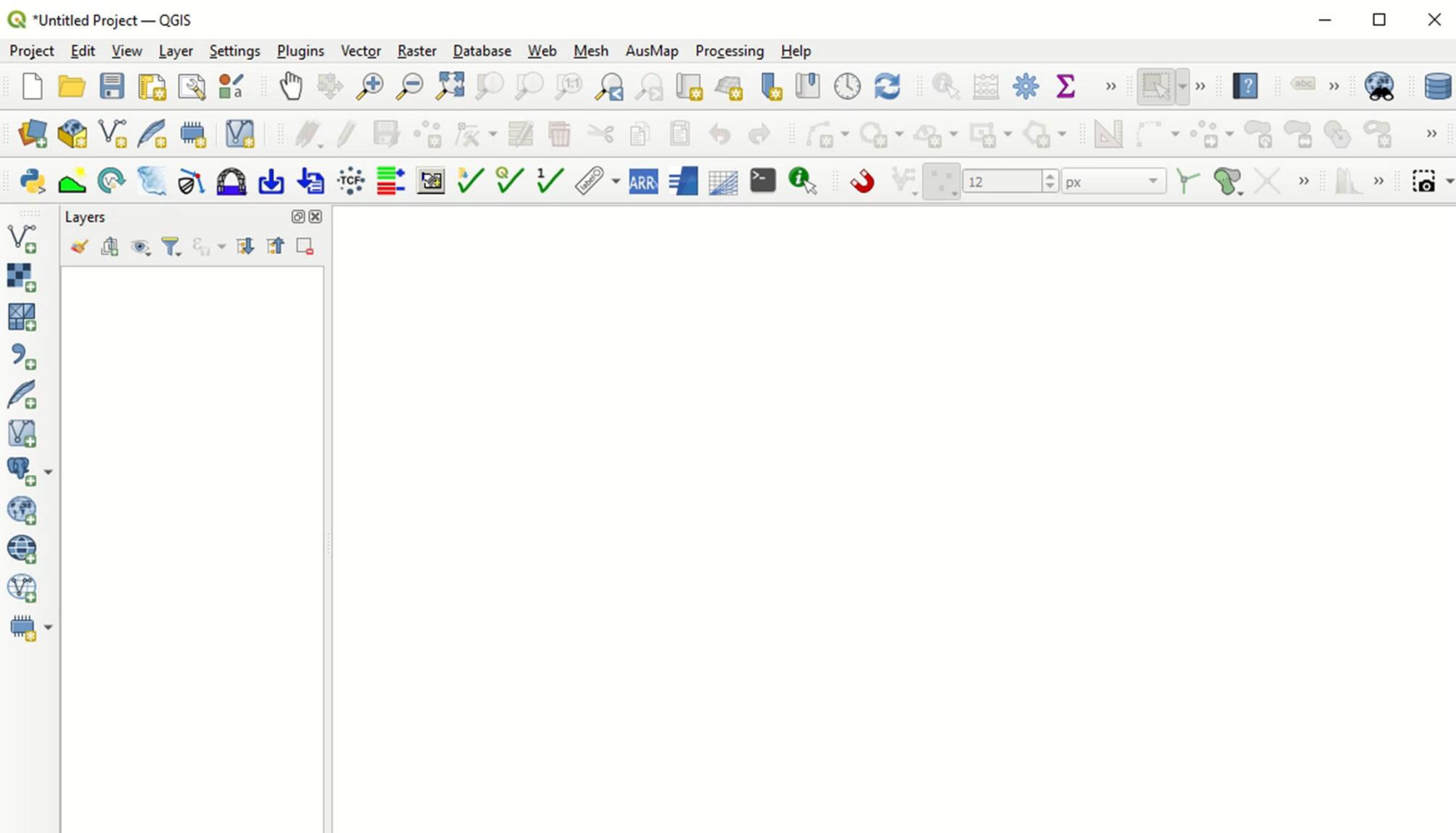
The screenshot displays the QGIS desktop environment. On the left, a vertical toolbar contains various icons for map navigation and editing. The main map area is currently blank. To the right of the map is a layer list panel containing four entries:

- workspace**
E:_Example_Models_QGIS\TUFLOW\workspace.qgz
EPSG:32760 (EPSG:32760 - WGS 84 / UTM zone 60S)
- arch_bridge**
E:_Example_Models_QGIS\TUFLOW\arch_bridge.qgz
EPSG:32760 (EPSG:32760 - WGS 84 / UTM zone 60S)
- workspace**
E:\TSC210733\workspace.qgz
EPSG:32760 (EPSG:32760 - WGS 84 / UTM zone 60S)
- murrugamba**
C:\TUFLOW\debugging\ARR_tool_debugging\murrugamba.qgz
EPSG:28356 (EPSG:28356 - GDA94 / MGA zone 56)

On the right side of the interface, there is a panel with several sections:

- QGIS Open Day 26 Feb 2021**
On Friday, 26 February 2021 we will be holding our monthly QGIS Open Day! What is a QGIS Open Day you may be wondering to yourself? It is an initiative to replace the wonderful community meetups we used to hold every six months when times were different. Like our in-person meetings, the event is organised on a principle of self-organisation and community participation. This open day will have the theme of "QGIS Plugged In!" and will be hosted, organised, focussed on and presented by young GIS practitioners from around the world! To find out more, please **double-click** this article to open the event page in your browser.
- Planned end of life for Windows 32-Bit Support**
QGIS will drop 32-bit support on Windows after the QGIS 3.16 release when we update our Qt dependencies to Qt 5.15. The update to Qt 5.15 is an important step towards staying in sync with Qt developments. Qt 5.15 is the minimum version that will provide forward compatibility with Qt 6. By updating to 5.15, we, therefore, ensure that QGIS is future proof. **Please double-click this entry to find out more.**
- Project Templates**
 - New Empty Project**
EPSG:32760 - WGS 84 / UTM zone 60S

SHP File – 46.5 million point dataset



GeoPackage File – 46.5 million point dataset

GeoPackage Summary

- Database format keeps your project folders and model structure neater
- Metadata can be included within database
- Spatially Indexed – loading, rendering, querying, selecting and editing is quicker
- Faster for TUFLOW to write (up to 3x faster than shape files)
- Note: Interoperable – QGIS, ArcGIS Pro, Mapinfo Pro

Flood Modelling Quality Control

Model Initialisation and Simulation Demonstration



Healthy models

>> faster simulation

>> produce reliable results

>> more efficient project execution

Healthy Model Model Initialisation Review Example

TUFLOW Checklist

1. Open TUFLOW Log File *<<simulation_name>>.tlf*
 - Inspect SIMULATION SUMMARY report (located at end of file)
 - Review the specific WARNING messages within the TLF
2. Open TUFLOW model *<<simulation_name>>.qgs*
 - Identify spatial location of issue *<<simulation_name>>_messages_P.shp*
 - Rectify issue if required
3. Rerun model simulation
4. Repeat

Healthy Model Model Initialisation Review Example

(C:) > TUFLOW > Training > TT154_Model_Health > TUFLOW > runs > log

Name	Type	Date modified	Size
FMA_T2_CPU_30m_Q100_001.qgs	QGIS Project	26/09/2022 1:45 PM	70 KB
FMA_T2_CPU_30m_Q100_001.tlf	TLF File	26/09/2022 2:05 PM	1,732 KB
FMA_T2_CPU_30m_Q100_001.tsf	TSF File	26/09/2022 2:05 PM	5 KB
FMA_T2_CPU_30m_Q100_001.wor	MapInfo Workspace	26/09/2022 1:45 PM	2 KB
FMA_T2_CPU_30m_Q100_001_cla_run_stats.txt	Text Document	26/09/2022 2:05 PM	15 KB
FMA_T2_CPU_30m_Q100_001_messages.csv	Microsoft Excel Comma Separat...	26/09/2022 1:59 PM	9 KB
FMA_T2_CPU_30m_Q100_001_messages_P.dbf	DBF File	26/09/2022 2:05 PM	11 KB
FMA_T2_CPU_30m_Q100_001_messages_P.prj	Text Document	26/09/2022 1:45 PM	1 KB
FMA_T2_CPU_30m_Q100_001_messages_P.shp	SHP File	26/09/2022 2:05 PM	2 KB
FMA_T2_CPU_30m_Q100_001_messages_P.shx	SHX File	26/09/2022 2:05 PM	1 KB
FMA_T2_CPU_30m_Q100_001_start_stats.txt	Text Document	26/09/2022 1:45 PM	9 KB
FMA_T2_CPU_30m_Q100_002.qgs	QGIS Project	1/06/2022 6:19 AM	70 KB
FMA_T2_CPU_30m_Q100_002.tlf	TLF File	1/06/2022 6:47 AM	1,732 KB
FMA_T2_CPU_30m_Q100_002.tsf	TSF File	31/05/2022 9:56 AM	5 KB
FMA_T2_CPU_30m_Q100_002.wor	MapInfo Workspace	31/05/2022 9:45 AM	2 KB
FMA_T2_CPU_30m_Q100_002...	...	31/05/2022 9:56 AM	15 KB

```
1
2 Build: 2022-05-QA-(2020 branch)-Beta-iSP-w64
3
4 Executable: ..\..\exe\2022-05-QA-Beta\TUFLOW_iSP_w64.exe (Copyright BMT WBM Pty Ltd)
5
6 Licence maintenance period: July 2021 - June 2022
7
8 Computer Name: WEBR1704
9
10 Simulation Started: 2022-May-31 09:33
11
12
13 Compiler: Intel Fortran v19.0; Single Precision; 64-bit
14
15 Hazard Routines ID in TUFLOW_USER_DEFINED.dll: Default Hazard Routines
16
17 Specified Events:
18 -e1 Q100
19
20 Specified Scenarios:
21 -s1 CPU
22 -s2 30m
23
24 Number of defined variables: 7
25 Set Variable ~S~ == CPU
26 Set Variable ~S1~ == CPU
27 Set Variable ~S2~ == 30m
28 Set Variable ~E~ == Q100
29 Set Variable ~E1~ == Q100
30 Set Variable 2D_CELL_SIZE == 30
31 Set Variable 2D_TIMESTEP == 8
32
```



File Home Share View

Clipboard: Pin to Quick access, Copy, Paste, Copy path, Paste shortcut

Organize: Move to, Copy to, Delete, Rename, New folder

New: New item, Easy access

Open: Properties, Edit, History

Select: Select all, Select none, Invert selection

← → ↑ ↓ This PC > Windows (C:) > TUFLOW > Training > TT154_Model_Health > TUFLOW > runs > log > CPU

Search CPU

- ENV-WEG-AUS TUFLOW - SBU Mark
- ENV-WEG-AUS TUFLOW Developm
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- Desktop
- Documents
- Downloads
- Music
- Pictures
- Videos
- brchfs\$ (\\wbm-hv13) (B:)
- Windows (C:)
- wp-share (F:)
- admin-share (G:)
- pcarchive (H:)
- drafting (I:)
- ecology (J:)
- rivers-fs (K:)
- coastal (L:)
- mapbase (M:)
- network (N:)
- oceanics (O:)
- catchments (P:)
- promo-material (Q:)
- basemap (Z:)
- Network
- WEBR1748

Name	Type	Date modified	Size
FMA_T2_CPU_30m_Q100_001.qgs	QGIS Project	1/06/2022 6:18 AM	70 KB
FMA_T2_CPU_30m_Q100_001.tif	TLF File	26/09/2022 12:02 PM	1,731 KB
FMA_T2_CPU_30m_Q100_001.tsf	TSF File	31/05/2022 9:45 AM	5 KB
FMA_T2_CPU_30m_Q100_001.wor	MapInfo Workspace	31/05/2022 9:33 AM	2 KB
FMA_T2_CPU_30m_Q100_001_cla_run_stats.txt	Text Document	31/05/2022 9:45 AM	15 KB
FMA_T2_CPU_30m_Q100_001_messages.csv	Microsoft Excel Comma Separat...	31/05/2022 9:42 AM	9 KB
FMA_T2_CPU_30m_Q100_001_messages_P.dbf	DBF File	31/05/2022 9:45 AM	11 KB
FMA_T2_CPU_30m_Q100_001_messages_P.prj	Text Document	31/05/2022 9:33 AM	1 KB
FMA_T2_CPU_30m_Q100_001_messages_P.shp	SHP File	31/05/2022 9:45 AM	2 KB
FMA_T2_CPU_30m_Q100_001_messages_P.shx	SHX File	31/05/2022 9:45 AM	1 KB
FMA_T2_CPU_30m_Q100_001_start_stats.txt	Text Document	31/05/2022 9:34 AM	9 KB
FMA_T2_CPU_30m_Q100_002.qgs	QGIS Project	1/06/2022 6:19 AM	70 KB
FMA_T2_CPU_30m_Q100_002.tif	TLF File	1/06/2022 6:47 AM	1,732 KB
FMA_T2_CPU_30m_Q100_002.tsf	TSF File	31/05/2022 9:56 AM	5 KB
FMA_T2_CPU_30m_Q100_002.wor	MapInfo Workspace	31/05/2022 9:45 AM	2 KB
FMA_T2_CPU_30m_Q100_002_cla_run_stats.txt	Text Document	31/05/2022 9:56 AM	15 KB
FMA_T2_CPU_30m_Q100_002_messages.csv	Microsoft Excel Comma Separat...	31/05/2022 9:54 AM	10 KB
FMA_T2_CPU_30m_Q100_002_messages_P.dbf	DBF File	31/05/2022 9:56 AM	13 KB
FMA_T2_CPU_30m_Q100_002_messages_P.prj	Text Document	31/05/2022 9:45 AM	1 KB
FMA_T2_CPU_30m_Q100_002_messages_P.shp	SHP File	31/05/2022 9:56 AM	2 KB
FMA_T2_CPU_30m_Q100_002_messages_P.shx	SHX File	31/05/2022 9:56 AM	1 KB
FMA_T2_CPU_30m_Q100_002_start_stats.txt	Text Document	31/05/2022 9:45 AM	9 KB
FMA_T2_CPU_30m_Q100_003.qgs	QGIS Project	1/06/2022 6:19 AM	70 KB
FMA_T2_CPU_30m_Q100_003.tif	TLF File	1/06/2022 6:47 AM	1,733 KB
FMA_T2_CPU_30m_Q100_003.tsf	TSF File	31/05/2022 10:05 AM	5 KB
FMA_T2_CPU_30m_Q100_003.wor	MapInfo Workspace	31/05/2022 9:56 AM	2 KB
FMA_T2_CPU_30m_Q100_003_cla_run_stats.txt	Text Document	31/05/2022 10:05 AM	15 KB
FMA_T2_CPU_30m_Q100_003_messages.csv	Microsoft Excel Comma Separat...	31/05/2022 10:03 AM	7 KB
FMA_T2_CPU_30m_Q100_003_messages_P.dbf	DBF File	31/05/2022 10:05 AM	9 KB
FMA_T2_CPU_30m_Q100_003_messages_P.prj	Text Document	31/05/2022 9:56 AM	1 KB
FMA_T2_CPU_30m_Q100_003_messages_P.shp	SHP File	31/05/2022 10:05 AM	1 KB
FMA_T2_CPU_30m_Q100_003_messages_P.shx	SHX File	31/05/2022 10:05 AM	1 KB

66 items | 1 item selected 69.8 KB



Healthy Model TUFLOW Model Simulation Review Example

TUFLOW Build: 2022-05-QA-(2020 branch)-Beta-iSP-w64 Control File: FMA_T2_~s1~_~s2~_~e1~_001.tcf Simulation: FMA_T2_CPU_30m_Q100_001

7115	15:48:40	-d	0	0	Wet	56034	CS	1035	205	CE	-2.6%	0.0%	-2.6%	Qi	6211	Qo	6978	dV	-9174	Mx	0	24	0.0
7116	15:48:48	-d	0	0	Wet	56038	CS	1037	200	CE	-2.6%	0.0%	-2.6%	Qi	6204	Qo	6966	dV	-9129	Mx	0	23	0.0
7117	15:48:56	-d	0	0	Wet	56035	CS	1036	197	CE	-2.6%	0.0%	-2.6%	Qi	6211	Qo	6958	dV	-9052	Mx	0	23	0.0
7118	15:49:04	-d	0	0	Wet	56044	CS	1050	193	CE	-2.6%	0.0%	-2.6%	Qi	6221	Qo	6972	dV	-9048	Mx	0	24	0.0
7119	15:49:12	-d	0	0	Wet	56051	CS	1048	198	CE	-2.6%	0.0%	-2.6%	Qi	6217	Qo	6982	dV	-9174	Mx	0	23	0.0
7120	15:49:20	-d	0	0	Wet	56053	CS	1040	192	CE	-2.6%	0.0%	-2.6%	Qi	6207	Qo	6971	dV	-9192	Mx	0	23	0.0
7121	15:49:28	-d	0	0	Wet	56059	CS	1040	202	CE	-2.6%	0.0%	-2.6%	Qi	6210	Qo	6966	dV	-9161	Mx	0	23	0.0
7122	15:49:36	-d	0	0	Wet	56062	CS	1050	195	CE	-2.6%	0.0%	-2.6%	Qi	6218	Qo	6980	dV	-9122	Mx	0	23	0.0
7123	15:49:44	-d	0	0	Wet	56067	CS	1033	191	CE	-2.6%	0.0%	-2.6%	Qi	6213	Qo	6990	dV	-9272	Mx	0	23	0.0
7124	15:49:52	-d	0	0	Wet	56073	CS	1055	190	CE	-2.6%	0.0%	-2.6%	Qi	6203	Qo	6983	dV	-9312	Mx	0	23	0.0
7125	15:50:00	-d	0	0	Wet	56073	CS	1044	195	CE	-2.6%	0.0%	-2.6%	Qi	6205	Qo	6980	dV	-9292	Mx	0	23	0.0
7126	15:50:08	-d	0	0	Wet	56075	CS	1027	186	CE	-2.6%	0.0%	-2.6%	Qi	6212	Qo	6998	dV	-9305	Mx	0	23	0.0
7127	15:50:16	-d	0	0	Wet	56084	CS	1026	190	CE	-2.6%	0.0%	-2.6%	Qi	6208	Qo	7011	dV	-9469	Mx	0	23	0.0
7128	15:50:24	-d	0	0	Wet	56090	CS	1040	185	CE	-2.6%	0.0%	-2.6%	Qi	6201	Qo	7001	dV	-9490	Mx	0	23	0.0
7129	15:50:32	-d	0	0	Wet	56092	CS	1017	185	CE	-2.6%	0.0%	-2.6%	Qi	6208	Qo	6990	dV	-9398	Mx	0	23	0.0
7130	15:50:40	-d	0	0	Wet	56096	CS	1015	183	CE	-2.6%	0.0%	-2.6%	Qi	6222	Qo	6995	dV	-9285	Mx	0	22	0.0
7131	15:50:48	-d	0	0	Wet	56107	CS	1015	195	CE	-2.6%	0.0%	-2.6%	Qi	6222	Qo	6994	dV	-9243	Mx	0	23	0.0
7132	15:50:56	-d	0	0	Wet	56108	CS	1023	184	CE	-2.6%	0.0%	-2.6%	Qi	6215	Qo	6973	dV	-9178	Mx	0	23	0.0
7133	15:51:04	-d	0	0	Wet	56119	CS	1029	178	CE	-2.6%	0.0%	-2.6%	Qi	6218	Qo	6958	dV	-9055	Mx	0	22	0.0
7134	15:51:12	-d	0	0	Wet	56120	CS	1028	194	CE	-2.6%	0.0%	-2.6%	Qi	6226	Qo	6965	dV	-8974	Mx	0	23	0.0
7135	15:51:20	-d	0	0	Wet	56128	CS	1027	188	CE	-2.6%	0.0%	-2.6%	Qi	6225	Qo	6974	dV	-9037	Mx	0	23	0.0
7136	15:51:28	-d	0	0	Wet	56134	CS	1028	185	CE	-2.6%	0.0%	-2.6%	Qi	6221	Qo	6968	dV	-9056	Mx	0	23	0.0
7137	15:51:36	-d	0	0	Wet	56139	CS	1014	190	CE	-2.6%	0.0%	-2.6%	Qi	6228	Qo	6964	dV	-9018	Mx	0	22	0.0
7138	15:51:44	-d	0	0	Wet	56143	CS	1022	188	CE	-2.6%	0.0%	-2.6%	Qi	6237	Qo	6977	dV	-9001	Mx	0	22	0.0
7139	15:51:52	-d	0	0	Wet	56147	CS	1020	189	CE	-2.6%	0.0%	-2.6%	Qi	6232	Qo	6987	dV	-9112	Mx	0	22	0.0
7140	15:52:00	-d	0	0	Wet	56149	CS	1019	188	CE	-2.6%	0.0%	-2.6%	Qi	6222	Qo	6978	dV	-9111	Mx	0	22	0.0
7141	15:52:08	-d	0	0	Wet	56155	CS	1009	189	CE	-2.6%	0.0%	-2.6%	Qi	6224	Qo	6970	dV	-9099	Mx	0	22	0.0
7142	15:52:16	-d	0	0	Wet	56155	CS	1007	184	CE	-2.6%	0.0%	-2.6%	Qi	6233	Qo	6981	dV	-9080	Mx	0	22	0.0
7143	15:52:24	-d	0	0	Wet	56160	CS	1001	197	CE	-2.6%	0.0%	-2.6%	Qi	6229	Qo	6993	dV	-9168	Mx	0	22	0.0
7144	15:52:32	-d	0	0	Wet	56167	CS	1005	186	CE	-2.6%	0.0%	-2.6%	Qi	6219	Qo	6988	dV	-9207	Mx	0	22	0.0
7145	15:52:40	-d	0	0	Wet	56172	CS	1005	191	CE	-2.6%	0.0%	-2.6%	Qi	6222	Qo	6981	dV	-9199	Mx	0	22	0.0

Healthy Model

TUFLOW Model Simulation Review Example

Different software + solution schemes require different health review techniques

TUFLOW Classic (Finite Difference Implicit Scheme)

- User defined timestep
- Solution can over/under shoot exact answer producing mass error
- Target mass error $< \pm 1\%$, model will crash if it is very unhealthy

TUFLOW HPC (Finite Volume Explicit Scheme)

- Automatic adaptive timestep
- Solver calculates appropriate timestep to maintain stable solution (Diffusion, Celerity and Courant Control Numbers)
- 100% 2D mass conservation, unconditionally stable
unhealthy models will however reduce to a small timestep



Healthy Model TUFLOW Model Simulation Review Example

DOS
or
<<simulation name>>.tlf

7123	15:49:44	-d	0	0	Wet	56067	CS	1033	205	CE	-2.6%	0.0%	-2.6%	Q	6211	Qo	6978	dV	-9174	Mx	0	24	0.0
7124	15:49:52	-d	0	0	Wet	56073	CS	1055	200	CE	-2.6%	0.0%	-2.6%	Q	6204	Qo	6966	dV	-9129	Mx	0	23	0.0
7125	15:50:00	-d	0	0	Wet	56073	CS	1044	197	CE	-2.6%	0.0%	-2.6%	Q	6211	Qo	6958	dV	-9052	Mx	0	23	0.0
7126	15:50:08	-d	0	0	Wet	56075	CS	1027	193	CE	-2.6%	0.0%	-2.6%	Q	6221	Qo	6972	dV	-9048	Mx	0	24	0.0
7127	15:50:16	-d	0	0	Wet	56084	CS	1026	198	CE	-2.6%	0.0%	-2.6%	Q	6217	Qo	6982	dV	-9174	Mx	0	23	0.0
7128	15:50:24	-d	0	0	Wet	56090	CS	1040	192	CE	-2.6%	0.0%	-2.6%	Q	6207	Qo	6971	dV	-9192	Mx	0	23	0.0
7129	15:50:32	-d	0	0	Wet	56092	CS	1017	202	CE	-2.6%	0.0%	-2.6%	Q	6210	Qo	6966	dV	-9161	Mx	0	23	0.0
7130	15:50:40	-d	0	0	Wet	56096	CS	1015	195	CE	-2.6%	0.0%	-2.6%	Q	6218	Qo	6980	dV	-9122	Mx	0	23	0.0
7131	15:50:48	-d	0	0	Wet	56107	CS	1015	191	CE	-2.6%	0.0%	-2.6%	Q	6213	Qo	6990	dV	-9272	Mx	0	23	0.0
7132	15:50:56	-d	0	0	Wet	56108	CS	1023	190	CE	-2.6%	0.0%	-2.6%	Q	6203	Qo	6983	dV	-9312	Mx	0	23	0.0
7133	15:51:04	-d	0	0	Wet	56119	CS	1029	195	CE	-2.6%	0.0%	-2.6%	Q	6205	Qo	6980	dV	-9292	Mx	0	23	0.0
7134	15:51:12	-d	0	0	Wet	56120	CS	1028	186	CE	-2.6%	0.0%	-2.6%	Q	6212	Qo	6998	dV	-9305	Mx	0	23	0.0
7135	15:51:20	-d	0	0	Wet	56128	CS	1027	190	CE	-2.6%	0.0%	-2.6%	Q	6208	Qo	7011	dV	-9469	Mx	0	23	0.0
7136	15:51:28	-d	0	0	Wet	56134	CS	1028	185	CE	-2.6%	0.0%	-2.6%	Q	6201	Qo	7001	dV	-9490	Mx	0	23	0.0
7137	15:51:36	-d	0	0	Wet	56139	CS	1014	185	CE	-2.6%	0.0%	-2.6%	Q	6208	Qo	6990	dV	-9398	Mx	0	23	0.0
7138	15:51:44	-d	0	0	Wet	56143	CS	1022	183	CE	-2.6%	0.0%	-2.6%	Q	6222	Qo	6995	dV	-9285	Mx	0	22	0.0
7139	15:51:52	-d	0	0	Wet	56147	CS	1020	195	CE	-2.6%	0.0%	-2.6%	Q	6222	Qo	6994	dV	-9243	Mx	0	23	0.0
7140	15:52:00	-d	0	0	Wet	56149	CS	1019	184	CE	-2.6%	0.0%	-2.6%	Q	6215	Qo	6973	dV	-9178	Mx	0	23	0.0
7141	15:52:08	-d	0	0	Wet	56155	CS	1009	178	CE	-2.6%	0.0%	-2.6%	Q	6218	Qo	6958	dV	-9055	Mx	0	22	0.0
7142	15:52:16	-d	0	0	Wet	56155	CS	1007	194	CE	-2.6%	0.0%	-2.6%	Q	6226	Qo	6965	dV	-8974	Mx	0	23	0.0
7143	15:52:24	-d	0	0	Wet	56160	CS	1001	188	CE	-2.6%	0.0%	-2.6%	Q	6225	Qo	6974	dV	-9037	Mx	0	23	0.0
7144	15:52:32	-d	0	0	Wet	56167	CS	1005	185	CE	-2.6%	0.0%	-2.6%	Q	6221	Qo	6968	dV	-9056	Mx	0	23	0.0
7145	15:52:40	-d	0	0	Wet	56172	CS	1005	190	CE	-2.6%	0.0%	-2.6%	Q	6228	Qo	6964	dV	-9018	Mx	0	22	0.0
									188	CE	-2.6%	0.0%	-2.6%	Q	6237	Qo	6977	dV	-9001	Mx	0	22	0.0
									189	CE	-2.6%	0.0%	-2.6%	Q	6232	Qo	6987	dV	-9112	Mx	0	22	0.0
									188	CE	-2.6%	0.0%	-2.6%	Q	6222	Qo	6978	dV	-9111	Mx	0	22	0.0
									189	CE	-2.6%	0.0%	-2.6%	Q	6224	Qo	6970	dV	-9099	Mx	0	22	0.0
									184	CE	-2.6%	0.0%	-2.6%	Q	6233	Qo	6981	dV	-9080	Mx	0	22	0.0
									197	CE	-2.6%	0.0%	-2.6%	Q	6229	Qo	6993	dV	-9168	Mx	0	22	0.0
									186	CE	-2.6%	0.0%	-2.6%	Q	6219	Qo	6988	dV	-9207	Mx	0	22	0.0
									191	CE	-2.6%	0.0%	-2.6%	Q	6222	Qo	6981	dV	-9199	Mx	0	22	0.0

```
<<Simulation name>>.tlf

Start Time (h): 0.
End Time (h): 30.
Computational Steps (based on largest 2D timestep): 13500
CPU Time: 0:16:59 [0.2831 h]
Clock Time: 0:17:12 [0.2867 h]

Simulation FINISHED

Classic 1D Negative Depths: 0
Classic 2D Negative Depths: 31

WARNINGS prior to simulation: 11 [0 not in _messages layer]
WARNINGS during simulation: 31 [0 not in _messages layer]
CHECKS prior to simulation: 0 [0 not in _messages layer]
CHECKS during simulation: 0 [0 not in _messages layer]

Peak Flow In (m3/s): 7654.5 at Time 23.39
Peak Flow Out (m3/s): 7157.2 at Time 14.97
Volume at Start (m3): 166452564
Volume at End (m3): 194609878
Total Volume In (m3): 489309700
Total Volume Out (m3): 436780499
Volume Error (m3): -24371886 or -2.6% of Volume In + Out
Final Cumulative ME: -2.63%
```

	Whole Simulation	Qi+Qo > 5%
Peak +ve dV (m3):	24181.8 at 9.57h	24181.8 at 9.57h
Peak -ve dV (m3):	-24458.5 at 28.19h	-24458.5 at 28.19h
Peak ddV over one timestep:	-1845.1 at 23.73h	1765.1 at 26.53h
Peak ddV as a % of peak dV:	7.5%	7.2%
Peak Cumulative ME:	-2.95% at 20.98h	-2.63% at 30.00h

Is the Cumulative Mass Error $\lt; \pm 1\%$

TUFLOW Control File Command: *Map Output Data Types == h V q d MB1 MB2*



*C:\TUFLOW\Training\TT154_Model_Health\TUFLOW\runs\log\CPU\FMA_T2_CPU_30m_Q100_001 — QGIS

Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help

Layers

- Input Layers
- Output Layers
- FMA_T2_CPU_10m_Q100_001**
 - Bed Elevation
 - 103.922
 - 16.292
- orthophoto
- FMA_T2_CPU_5m_BASE_000_DEM_Z

TUFLOW Viewer

Open Results

FMA_T2_CPU_10m_Q100_001

Map Output Plotting

From Map

Result Type

- Map Outputs
 - Bed Elevation
 - Depth
 - MB1
 - MB2
 - Unit Flow
 - Vector Unit Flow
 - Vector Velocity
 - Velocity
 - Water Level
 - Time of Peak V
 - Time of Peak h
- Time Series
 - None

X: Y: Z:

Show Current Time Show as dates

00:00:00.00

TUFLOW Viewer Browser

Type to locate (Ctrl+K)

Coordinate 5150,11675 Scale 1:43169 Magnifier 100% Rotation 0.0° Render EPSG:3309

Healthy Model

TUFLOW Model Simulation Review Example

Different solution schemes require different simulation health review techniques

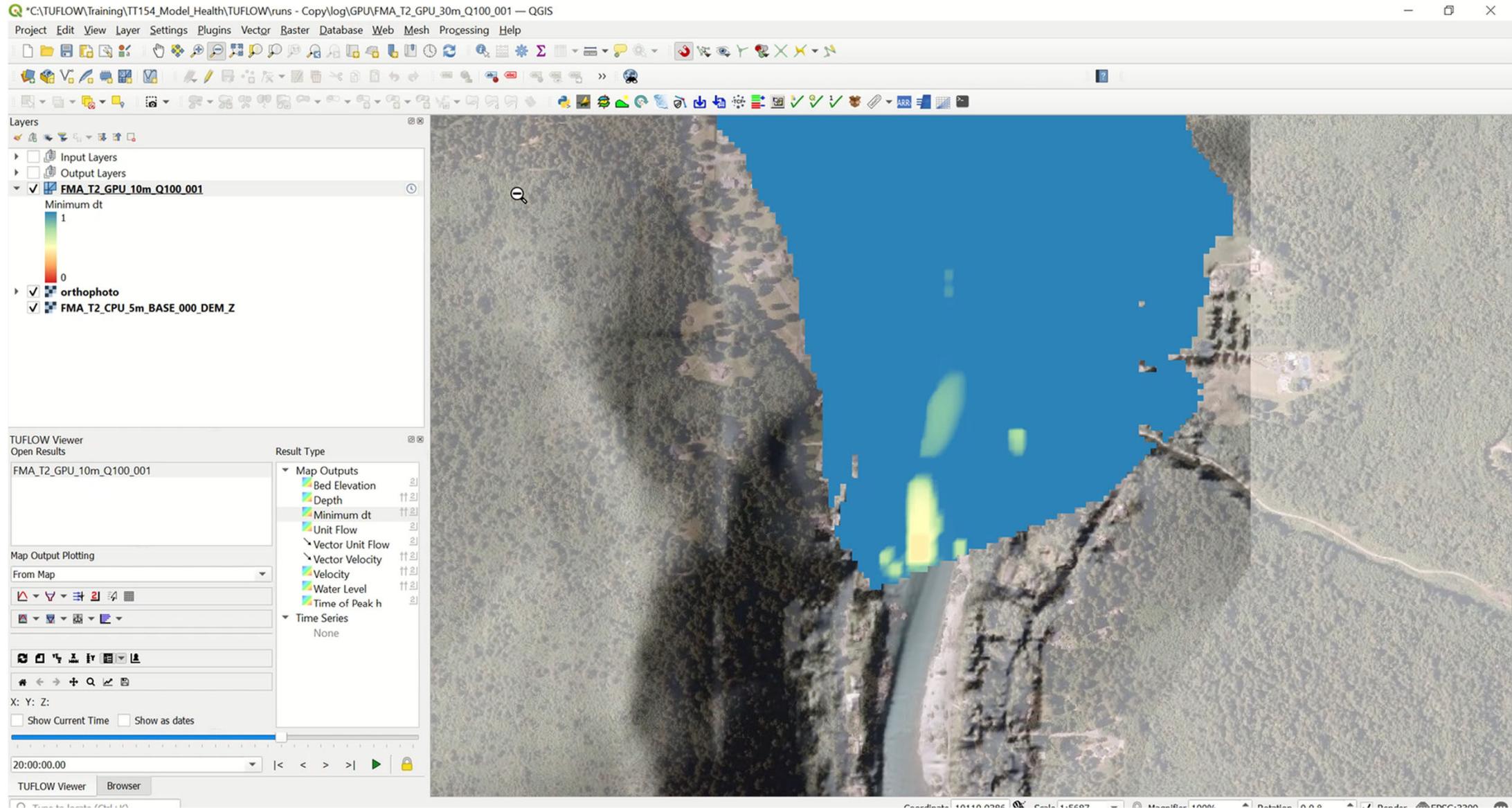
TUFLOW Classic (Finite Difference Implicit Scheme)

- User defined timestep
- Solution can over/under shoot exact answer producing mass error
- Target mass error $< \pm 1\%$, model will crash if it is very unhealthy

TUFLOW HPC (Finite Volume Explicit Scheme)

- Automatic adaptive timestep
- Solver calculates appropriate timestep to maintain stable solution (Diffusion, Celerity and Courant Control Numbers)
- 100% 2D mass conservation, unconditionally stable
unhealthy models will however reduce to a small timestep





https://wiki.tuflow.com/index.php?title=HPC_Adaptive_Timestepping

The screenshot displays the TUFLOW software interface. The top menu bar includes Project, Edit, View, Layer, Settings, Plugins, Vector, Raster, Database, Web, Mesh, Processing, and Help. The Layers panel on the left lists various model outputs, with 'FMA_T2_CPU_10m_Q100_001_DEM_Z' selected. The TUFLOW Viewer panel shows 'Open Results' for 'FMA_T2_CPU_10m_Q100_001', 'FMA_T2_GPU_10m_Q100_001', and 'FMA_T2_GPU_10m_Q100_006'. The 'Result Type' panel is expanded to show 'Map Outputs' including Bed Elevation, Depth, Minimum dt, Unit Flow, Vector Unit Flow, Vector Velocity, Velocity, Water Level, and Time of Peak h. The 'Time Series' section is set to 'None'. The main map area shows a topographic map with a blue overlay representing a model output. A large pink text overlay in the center of the map asks: 'What was causing the model health issues in the two problem locations?'. The bottom status bar shows 'Coordinate: 10606 3 9042 0', 'Scale: 1:3308', 'Magnifier: 100%', 'Rotation: 0 0 °', 'Render', and 'FPS: 3300'.

*C:\TUFLOW\Training\TT154_Model_Health\TUFLOW\runs\log\CPU\FMA_T2_CPU_30m_Q100_001 — QGIS

Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help

Layers

- FMA_T2_CPU_30m_Q100_001_dom_check (R) {5}
- FMA_T2_CPU_30m_Q100_001_PLOT (P) {7}
- FMA_T2_CPU_30m_Q100_001_zsh_zpt_check (P) {10}
- FMA_T2_CPU_10m_Q100_001_DEM_Z
- FMA_T2_CPU_30m_Q100_001_DEM_Z
- FMA_T2_CPU_30m_Q100_001_sh_obj_check (R) {11}
- FMA_T2_CPU_30m_Q100_001_po_check (L) {18}
- FMA_T2_CPU_10m_Q100_006_bcc_check_R
- FMA_T2_CPU_10m_Q100_001_bcc_check_R
- FMA_T2_CPU_30m_Q100_001_bcc_check (R) {20}
- FMA_T2_CPU_30m_Q100_001_nwk_C_check (L) {21}
- FMA_T2_CPU_30m_Q100_001_nwk_N_check (P) {22}
- FMA_T2_CPU_30m_Q100_001_iwl_check (P) {23}
- FMA_T2_CPU_30m_Q100_001_inverts_check (P) {24}
- FMA_T2_CPU_30m_Q100_001_hydprop_check (L) {25}
- FMA_T2_CPU_30m_Q100_001_1d_to_2d_check (R) {27}
- FMA_T2_CPU_30m_Q100_001_grd_check (R) {28}
- FMA_T2_GPU_10m_Q100_006

TUFLOW Viewer

Open Results

FMA_T2_CPU_10m_Q100_001
FMA_T2_GPU_10m_Q100_001
FMA_T2_GPU_10m_Q100_006

Map Output Plotting

From Map

Result Type

- Map Outputs
 - Bed Elevation
 - Depth
 - Minimum dt
 - Unit Flow
 - Vector Unit Flow
 - Vector Velocity
 - Velocity
 - Water Level
 - Time of Peak h
- Time Series
 - None

X: Y: Z:

Show Current Time Show as dates

23:00:00.00

TUFLOW Viewer Browser

Model Health

TUFLOW Model Simulation Review Example

30 metre grid resolution flood model

TUFLOW Classic

- Initial Model: $CE \approx -2.63\%$ Simulation time = 30 min
- Updated Model: $CE \approx -0.18\%$ Simulation time = 30 min

TUFLOW HPC

- Initial Model: $dt \approx 0.3s$ Simulation time = 18 min
- Updated Model: $dt \approx 3.0s$ Simulation time = 3 min

Flood Modelling Quality Control

Software Suitability

Other TUFLOW AWS Webinars

Software Suitability



<https://www.tuflow.com/library/webinars/>

Flood Modelling Quality Control

Version Control, Documentation and Peer Review

Model Version Control Change Log Documentation

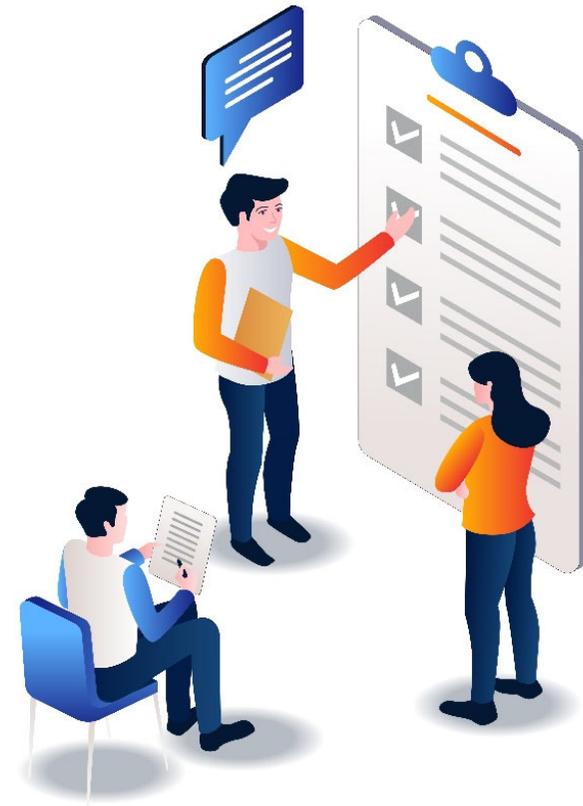
- Modelling Log (Excel or similar): File Download

Run ID	Date	Model Developer (Initials)	Peer Reviewed (No / Yes - Initials)	TUFLOW Exe Version	n/c = no change since prior model version					Change Description	Results / Comments
					TCF	ECF	TGC	TBC	Bc_dbase		
0	29/09/2022	CDH	No	2020-10-AE	AWS_~s1~_~s2~_~e1~_~e2~_~e3~_000	AWS_000	AWS_000	AWS_000	AWS_000	Initial model build	
1	30/09/2022	CDH	No	2020-10-AE	AWS_~s1~_~s2~_~e1~_~e2~_~e3~_001	n/c	AWS_001	n/c	n/c	Added road bridge breaklines	
2	1/10/2022	CDH	PAR	2020-10-AE	AWS_~s1~_~s2~_~e1~_~e2~_~e3~_002	n/c	AWS_002	n/c	n/c	Enabled SGS	Model Peer reviewed - refer to peer review O:\Projects\B23058_SBV\Peer_Review\AWS_~s1~_~s2~_~e1~_~e2~_~e3~_002
3	1/10/2022	CDH	No	2020-10-AE	AWS_~s1~_~s2~_~e1~_~e2~_~e3~_003	n/c	n/c	AWS_003	n/c	Addressed peer review comments	

https://downloads.tuflow.com/Training/Modelling_Log_and_Review_Template.xlsx

Peer Review

- **Necessary for all modelling projects**
- **Consider key project milestones where modelling mistakes may have a compounding effect later in a project:**
 - Calibration event modelling
 - Design event modelling
 - etc.
- **The peer review approach should match the scale and objectives of the project**
- **Task for suitably qualified person**



https://downloads.tuflow.com/Training/Modelling_Log_and_Review_Template.xlsx

Peer Review Spreadsheet

File Download

Severity	Issue Description			Modeller:								
1	NO ISSUE	<p>Note: Add/delete items as needed. The reporting level of detail should reflect the complexity of the modelling project</p>		Reviewer:								
2	MINOR ISSUE - Likely to have only a minor impact on results and is somewhat subjective - Consider fixing if model is being re-run for other reasons			Date:								
3	MODERATE ISSUE - Likely to have some impact on results (local or wider) - Strongly recommend fixing (definitely fix if re-running for other reasons)			Model Run ID:								
4	MAJOR ISSUE - An error or omission that will noticeably affect results (local or wider) - Must be fixed			GIS File Defining Location of Issue:								
Item ID	Review Item	Modeller Comment (Optional Clarification for Reviewer)	Is current setup appropriate? (Yes, No, N/A, Not Reviewed)	Severity of Issue (1, 2, 3, 4)	Reviewer Comment	Modeller Response	Review Sign Off (Resolved, Unresolved, N/A)					
11	Is sub-grid sampling (SGS) is used? Is yes, are unnecessary gully/min breaklines removed (the features are already implicitly represented by the SGS scheme)?		N/A	N/A			N/A					
12	If multiple topography input layers are used, is data layering of the layers correct (i.e. The order of the files with the TUFLOW Geometry Control File)? Note, bottom most layer takes precedence where datasets overlap.		Yes	1			N/A					
13	Are the Manning's n values appropriate?		No	3			Resolved					
14	Is / are the Materials Layer(s) delineation appropriate (relative to the model cell size)?		No	4			Unresolved					

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Presentation Summary

Flood Model Quality Control

1. Review input data suitability before use
2. Implement input data and design model in line with best practice
3. Review model health after simulation
4. Consider suitability of the software being used
5. Design the project structure to meet project objectives and facilitate error minimisation
 - Calibration / validation
 - Peer review hold points
 - Model documentation, version control etc.

Questions?

