BASEMENT

Postprocessing of *BASEMENT* 2D results

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BASEMENT Anwendertreffen

24. Januar 2019

Laboratory of Hydraulics,
Hydrology and Glaciology

2D Visualization using QGIS

BASEMENT 2.8

QGIS 2.18

Crayfish 2.7

BASEMENT 3.x

QGIS 3.x

(Crayfish 3.x)

Current status

QGIS 2.18 & *BASEMENT* 2.8

BASEMENT 2.8
- nds /els *.sol
- 2dm (nds)

nds: node centred
els: element centred

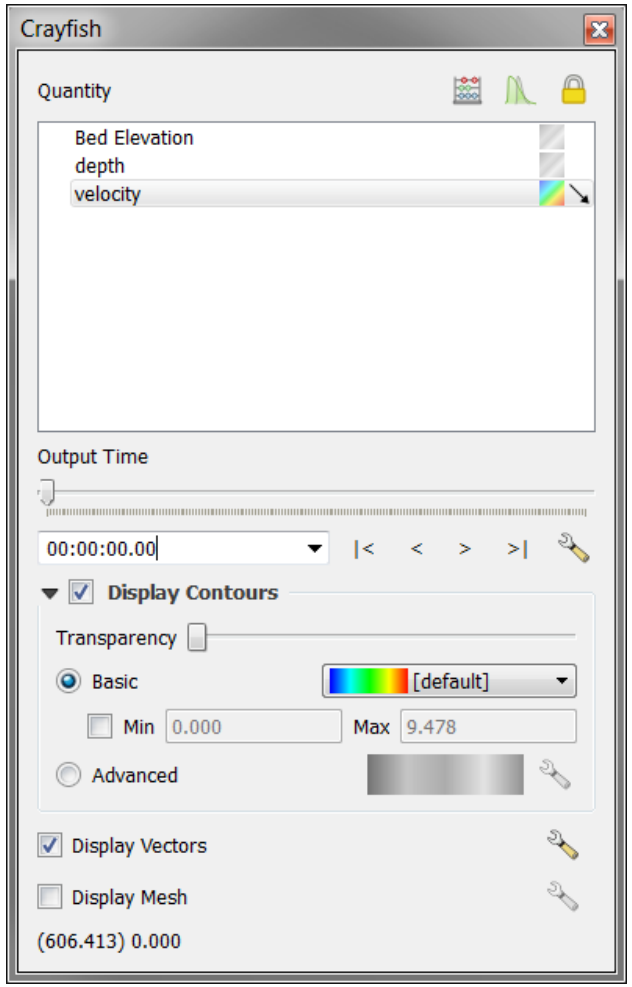
- QGIS 2.x & Crayfish 2.x all features as QGIS's plugin layer
- Rendering and format reading in C++ language
- Crayfish 2 shipped as C++ library and QGIS python plugin

QGIS 2.18

Crayfish 2.7
- 2dm (Bed elevation)
- nds / els results (*.sol)
- plot/animation
- export (raster)
- grid calculator

Current status

QGIS 2.18 & *BASEMENT* 2.8



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QGIS 2.18

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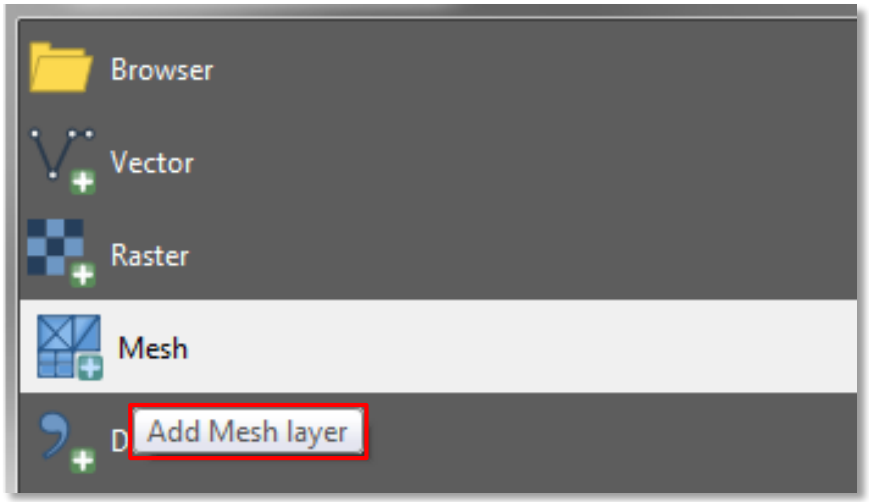
Current status
QGIS 3.4



QGIS Enhancement:
Unstructured Mesh Layer

- 2dm files
- simulation results

- QGIS 3.4 & Crayfish 3.0, C++ library replaced by MDAL*
- Crayfish simple python plugin (no platform specific libraries)
- Make use of QGIS Unstructured Mesh Layer

QGIS 3.4

- 2dm (bed elevation)
- results

Crayfish 3.0

- plot/animation
- export (raster)

*Mesh Data Abstraction Library

Future development

QGIS 3.x & *BASEMENT* 2.8.x

BASEMENT 2.8.x
- nds /els *.dat
- 2dm (nds)

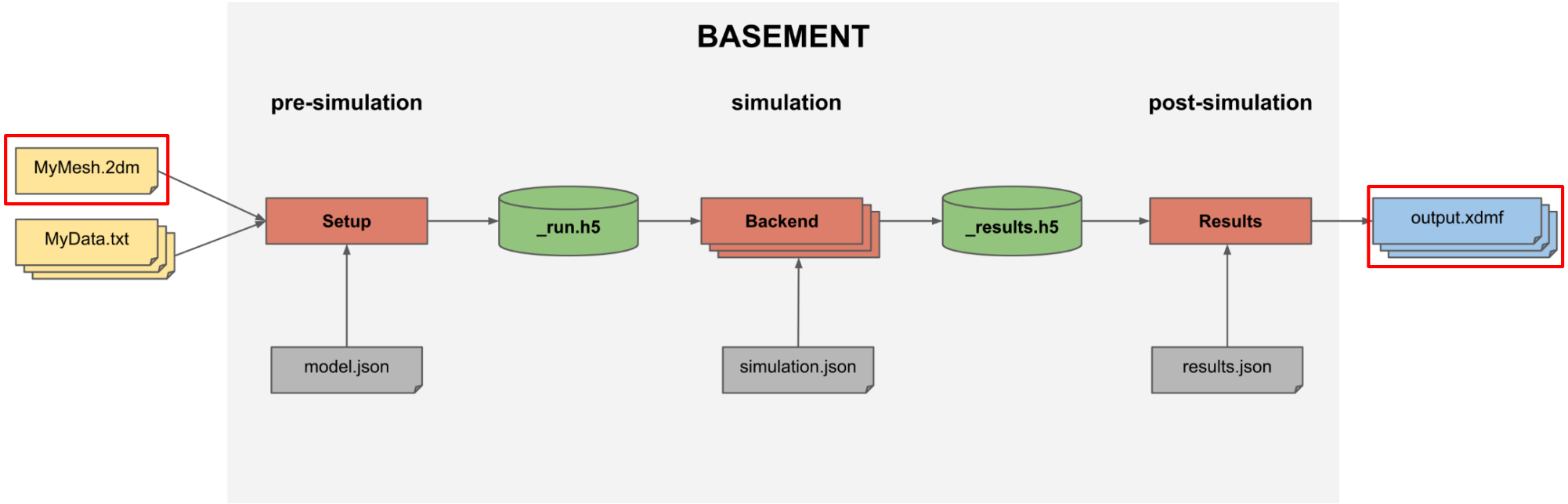
- QGIS 3.x & Crayfish 3.x, C++ library replaced by MDAL
- Crayfish simple python plugin (no platform specific libraries)
- Make use of QGIS Unstructured Mesh Layer

QGIS 3.x
- 2dm (bed elevation)
- nds / els results
  - *.dat
- grid calculator
- 3D view

Crayfish 3.x
- plot/animation
- export (raster)

Future development

QGIS 3.x & *BASEMENT* 3.x



Future development

QGIS 3.x & *BASEMENT* 3.x

BASEMENT 3.x
- els *.xdmf
- 2dm (els)

Implementation of:
- xdmf support for unstructured mesh layer
- els 2dm

Lutra CONSULTING

- QGIS 3.4 & Crayfish 3.x, C++ library replaced by MDAL
- Crayfish simple python plugin (no platform specific libraries)
- Make use of QGIS Unstructured Mesh Layer

QGIS 3.x
- 2dm (Bed elevation)
- els results
  - *.xdmf
- grid calculator
- 3D view

Crayfish 3.x
- plot/animation
- export (raster)

Future development

Summary QGIS visualization

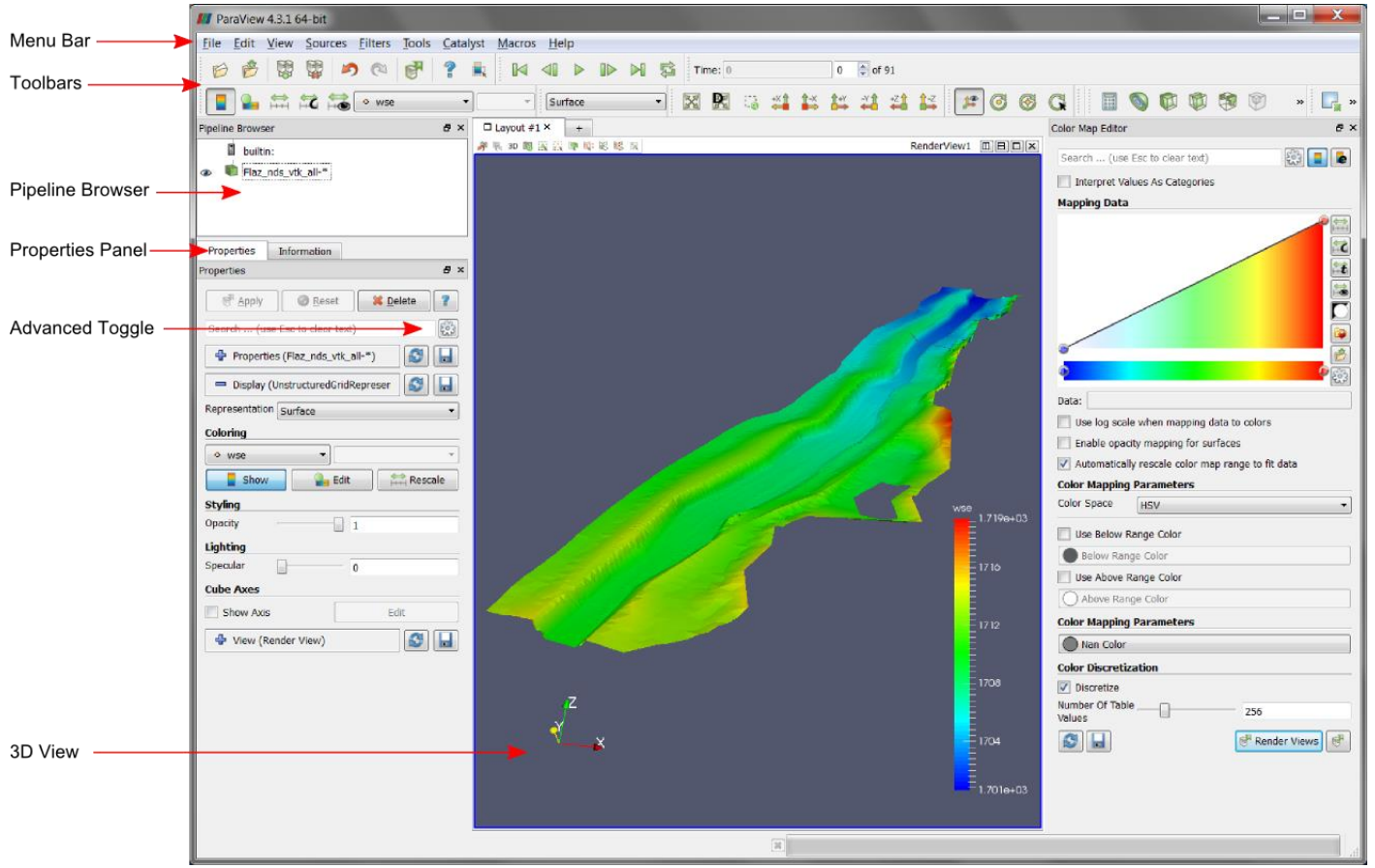
	QGIS 2.18 (Crayfish)	QGIS 3.x (MDAL)
BASEMENT 2.8	• 2dm (nds) • nds/els (*.sol) ✓	• 2dm (nds) ✓
BASEMENT 2.8.x	• 2dm (nds) • nds/els (*.sol)	• 2dm (nds) • nds/els (*.dat)
BASEMENT 3.x	**(X)**	• 2dm (els) • els (*.xdmf)

QGIS v3.7 (July 2019)

QGIS alternatives

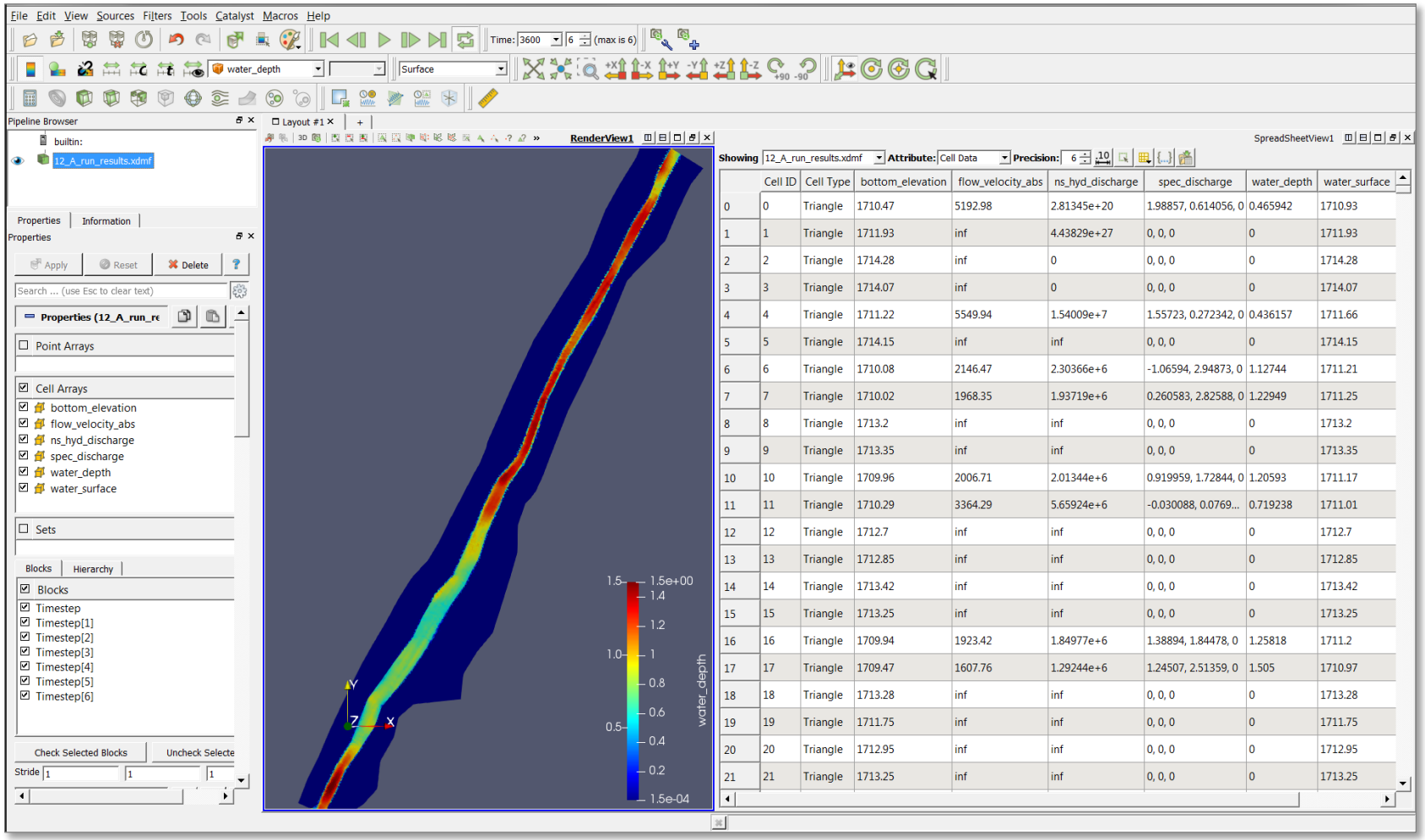
Paraview visualization (*.xdmf)

- Tutorials *BASEMENT* 2.8



QGIS alternatives

Paraview visualization (*.xdmf) – export to QGIS



	Cell ID	Cell Type	bottom_elevation	flow_velocity_abs	ns_hyd_discharge	spec_discharge	water_depth	water_surface
0	0	Triangle	1710.47	5192.98	2.81345e+20	1.98857, 0.614056, 0	0.465942	1710.93
1	1	Triangle	1711.93	inf	4.43829e+27	0, 0, 0	0	1711.93
2	2	Triangle	1714.28	inf	0	0, 0, 0	0	1714.28
3	3	Triangle	1714.07	inf	0	0, 0, 0	0	1714.07
4	4	Triangle	1711.22	5549.94	1.54009e+7	1.55723, 0.272342, 0	0.436157	1711.66
5	5	Triangle	1714.15	inf	inf	0, 0, 0	0	1714.15
6	6	Triangle	1710.08	2146.47	2.30366e+6	-1.06594, 2.94873, 0	1.12744	1711.21
7	7	Triangle	1710.02	1968.35	1.93719e+6	0.260583, 2.82588, 0	1.22949	1711.25
8	8	Triangle	1713.2	inf	inf	0, 0, 0	0	1713.2
9	9	Triangle	1713.35	inf	inf	0, 0, 0	0	1713.35
10	10	Triangle	1709.96	2006.71	2.01344e+6	0.919959, 1.72844, 0	1.20593	1711.17
11	11	Triangle	1710.29	3364.29	5.65924e+6	-0.030088, 0.0769...	0.719238	1711.01
12	12	Triangle	1712.7	inf	inf	0, 0, 0	0	1712.7
13	13	Triangle	1712.85	inf	inf	0, 0, 0	0	1712.85
14	14	Triangle	1713.42	inf	inf	0, 0, 0	0	1713.42
15	15	Triangle	1713.25	inf	inf	0, 0, 0	0	1713.25
16	16	Triangle	1709.94	1923.42	1.84977e+6	1.38894, 1.84478, 0	1.25818	1711.2
17	17	Triangle	1709.47	1607.76	1.29244e+6	1.24507, 2.51359, 0	1.505	1710.97
18	18	Triangle	1713.28	inf	inf	0, 0, 0	0	1713.28
19	19	Triangle	1711.75	inf	inf	0, 0, 0	0	1711.75
20	20	Triangle	1712.95	inf	inf	0, 0, 0	0	1712.95
21	21	Triangle	1713.25	inf	inf	0, 0, 0	0	1713.25

Contact information

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