

# **What is missing from the EIA report**

- Realistic Economic Feasibility and Acceptable Risk Analyses
- Water Treatment Costs in Economic Downturns and Perpetuity
- Environmental Stewardship Obligations Re: Polluted Pit Lake
- Clear Disaster Model– Likely Worst Case Scenario
- The Failure of Governmental Regulation

*Compiled by Lawrence Wuest, a resident of the Upper Nashwaak, and presented in Stanley to the Expert Review Panel on the EIA of the Sisson Mine, 22 June, 2015*

**This new “Briklin”/“Atcon” adventure epitomizes  
“Why we are Where we are as a Province”.**

# Economic Feasibility NOT

Due to falling metal prices since 2013, this mine has gone from being marginally feasible to being an outright economic disaster.

Politicians and the public are in denial.

22.5.3 Post-Tax IRR Sensitivity Table – Metal Prices

The results of metal price sensitivity analysis for APT (US\$/mtu) and molybdenum (US\$/lb) on the Sisson Project's Post-tax IRR are summarized in Table 22.11.

Table 22.11 Post-Tax IRR Sensitivity – Metal Prices												
Molybdenum Price	Tungsten Price											
	250	275	300	325	350	375	400	425	450	475	500	
	12.0	6.0%	8.7%	11.0%	13.1%	15.0%	16.8%	18.5%	20.2%	21.8%	23.3%	24.8%
	12.5	6.3%	9.0%	11.3%	13.3%	15.2%	17.0%	18.7%	20.4%	22.0%	23.5%	25.0%
	13.0	6.7%	9.3%	11.5%	13.5%	15.4%	17.2%	18.9%	20.6%	22.2%	23.7%	25.1%
	13.5	7.0%	9.6%	11.8%	13.8%	15.7%	17.4%	19.1%	20.8%	22.3%	23.8%	25.3%
	14.0	7.4%	9.9%	12.0%	14.0%	15.9%	17.6%	19.3%	20.9%	22.5%	24.0%	25.5%
	14.5	7.7%	10.2%	12.3%	14.2%	16.1%	17.8%	19.5%	21.1%	22.7%	24.2%	25.6%
	15.0	8.0%	10.4%	12.5%	14.5%	16.3%	18.0%	19.7%	21.3%	22.9%	24.4%	25.8%
	15.5	8.4%	10.7%	12.8%	14.7%	16.5%	18.2%	19.9%	21.5%	23.0%	24.5%	26.0%
	16.0	8.7%	11.0%	13.0%	14.9%	16.7%	18.4%	20.1%	21.7%	23.2%	24.7%	26.1%
	16.5	9.0%	11.2%	13.3%	15.1%	16.9%	18.6%	20.3%	21.9%	23.4%	24.9%	26.3%
	17.0	9.3%	11.5%	13.5%	15.4%	17.1%	18.8%	20.5%	22.0%	23.6%	25.0%	26.5%
	17.5	9.6%	11.8%	13.7%	15.6%	17.3%	19.0%	20.6%	22.2%	23.7%	25.2%	26.6%
	18.0	9.9%	12.0%	14.0%	15.8%	17.5%	19.2%	20.8%	22.4%	23.9%	25.4%	26.8%

22.5.4 Post-Tax NPV Sensitivity Table – Metal Prices

The results of metal price sensitivity analysis for APT and molybdenum on the Sisson Project's Post-tax NPV are summarized in Table 22.12.

Tungsten Price												
	250	275	300	325	350	375	400	425	450	475	500	
12.0	84	30	137	240	341	441	540	638	734	830	926	
12.5	70	43	150	253	354	454	552	650	747	842	938	
13.0	55	57	163	265	367	466	565	662	759	854	950	
13.5	41	71	177	278	379	479	577	674	771	867	962	
14.0	26	85	190	291	392	491	590	687	783	879	974	
14.5	12	98	203	304	405	504	602	699	795	891	986	
15.0	2	112	216	317	418	516	614	711	807	903	998	
15.5	17	125	229	330	430	529	626	723	819	915	1,010	
16.0	31	138	242	343	443	541	639	736	831	927	1,022	
16.5	45	152	255	356	455	554	651	748	844	939	1,035	
17.0	59	165	268	368	468	566	663	760	856	951	1,047	
17.5	72	178	281	381	480	578	676	772	868	963	1,059	
18.0	86	192	293	394	493	591	688	784	880	975	1,071	

Source: Samuel Engineering. 2013 CANADIAN NATIONAL INSTRUMENT 43-101 TECHNICAL REPORT ON THE Sisson Project New Brunswick, Canada Effective Date: January 22, 2013. Accessed at <http://www.sissonpartnership.com/i/seiar/4-Other-Documents/02-Sisson-43-101-Technical-Report-Final-Jan13.pdf> on 14 May, 2015.

## •Economic Feasibility, Economic Reality and Acceptable Risk

Since Last Sisson Economic Feasibility March 2013 by Samuel Engr.,

	Price of Tungsten	Price of Molybdenum
March, 2013	\$350/mtu	\$15/lb.
June, 2015	\$232/mtu	\$ 8/lb

From Samuel's price sensitivity analysis


•Net Present Value shrunk from \$418 Million to a net **negative value of -\$300 Million**

Under these metal prices there can be

- **NO metallic mineral taxes** generated by this mine.
- **NO acceptable level of economic, environmental or health risk**

The 104 year history of metal prices shows that this mine will likely spend nearly ½ its life in unprofitable bust cycles, accompanied by mine closures and drains on the provincial budget for water treatment and social assistance.

Net Present Value (NPV) range at <104 yr. median prices for tungsten and moly from USGS data



**Tungsten Price 2015 US\$/mtu**

	225	250	275	300	325	350	375	400	425	450	475	500
Molybdenum Price 2015 US\$/lb	-345	-210	-81	20	124	224	334	423	526	626	722	816
7.5	-329	-196	-74	33	137	237	347	436	539	638	734	828
8.0	-313	-182	-61	46	150	250	360	449	552	650	746	840
8.5	-297	-168	-48	59	163	263	373	462	565	662	758	852
9.0	-281	-154	-35	72	176	276	376	475	578	674	770	864
9.5	-265	-140	-22	85	189	289	389	488	590	686	782	876
10.0	-249	-126	-9	98	202	302	402	501	602	698	794	888
10.5	-233	-112	4	111	215	315	415	514	614	710	806	902
11.0	-217	-98	17	124	228	328	428	527	626	722	818	914
11.5	-201	-84	30	137	240	341	441	540	638	734	830	926
12.0	-185	-70	43	150	253	354	454	552	650	747	842	938
12.5	-169	-55	57	163	265	367	466	565	662	759	854	950
13.0	-153	-41	71	177	278	379	479	577	674	771	867	962
13.5	-137	-26	85	190	291	392	491	590	687	783	879	974
14.0	-120	-12	98	203	304	405	504	602	699	795	891	986
14.5	-108	2	112	216	317	418	516	614	711	807	903	998
15.0	-91	17	125	229	330	430	529	626	723	819	915	1,010
15.5	-76	31	138	242	343	443	541	639	736	831	927	1,022
16.0	-62	45	152	255	356	455	554	651	748	844	939	1,035
16.5	-47	59	165	268	368	468	566	663	760	856	951	1,047
17.0	-34	72	178	281	381	480	578	676	772	868	963	1,059
17.5	-20	86	192	293	394	493	591	688	784	880	975	1,071
18.0												

Net Present Value extrapolated from Samuels Engr.2013 Feasibility Study. Extrapolated values in red

## **Economic Reality and Acceptable Risk**

1. **Yes**, metal prices fluctuate.
2. **Yes**, there will be long periods when this mine will be unprofitable to operate and maintain. This would be the case today had the previous owner GEODEX successfully opened this mine in 2008.
3. **Yes**, rain will fall during dormancy and the tailing pond will overtop if water is not released.
4. **Yes**, water treatment costs of \$12 Million per year will be required to effectively treat the released water.
5. **Yes**, the \$22 million set aside for a \$11 Million water treatment plant AND \$11 Million for water treatment for perpetuity will be quickly gone.
6. **Yes**, fiscal realities will force the NB Government to allow contaminated mine water into the Napadogan Brook and the Nashwaak Stream.

***Your Taxes will be subsidizing this unprofitable mine***

# **WHY is it not feasible??..... Because the ore is so poor.**

Company	tonnage	%WO3				
<b>Wolf Minerals</b>	35.7	0.18		64260		<i>Commissioning Hemerdon</i>
<b>Carbine Tungsten</b>				0		<i>Resources only, treating</i>
<b>Almonty</b>	3.9	0.28		10920		<i>Producer —Los Santos,</i>
<b>Ormonde</b>	8.7	0.30		26100		<i>Seeking funding solution</i>
<b>King Island Scheelite</b>				0		<i>Resources only</i>
<b>Woulfe Mining</b>	13.3	0.43		57190		<i>Seeking funding solution</i>
<b>W Resources</b>				0		<i>Resources only</i>
<b>Northcliff</b>	334.0	0.07		233800		<i>Undertaking studies</i>
<b>Vital Metals</b>	21.3	0.15		31950		<i>Seeking funding solution</i>
<b>North American Tungsten</b>	12.6	1.13		142380		<i>Mining Cantung, Canada</i>
<b>Tungsten Mining</b>						<i>Resources only</i>

*From: 29 April 2015 Wolf Minerals Investor Presentation. Russell Clark, Managing Director  
Edison Tungsten Sector Report December 2014, 2. Metal Pages April 24th 2015*

**Sisson ore is less than 1/2 the richness of its nearest competitor and less than 1/16<sup>th</sup> the richness of the proposed Cantung mine extension**

# Environmental Stewardship and a Polluted Pit Lake

The government is allowing the proponent to empty the contaminated tailings pond directly into the open-pit at closure. The Shale Gas industry is not permitted to dispose of waste-water in this manner and neither should the Sisson mine.

The proponent seeks to avoid \$150 Million in water treatment costs by this sleight of hand. The government is letting them get away with it.

***This is another classic case of leaving a mess for future generations.***

# **Disaster Model– Likely Worst Case Scenario**

STANTEC says that risk of tailing dam failure is not a credible concern. The U.S. EPA and the expert Panel Report on the Mount Polley Mine failure seem to disagree

STANTEC does not like historical data as a basis for predictive modeling, however, every dam that ever failed was designed to engineering standards that said failure was not likely to happen

***Show us a peer reviewed Model***





Toxic waste flows through the breached wall of the tailings pond at Imperial Metals' Mount Polley gold-copper mine, 140 km southeast of Quesnel, B.C. Credit: screenshot from Cariboo Regional District video.

## Mount Polley dam

- Centreline design
- Built on glacial till
- Poorly maintained
- Poorly regulated

***All of the above will similarly apply to Sisson***



Source unknown



Source unknown

# **Appendix II**

## **Model**

### **Tailing Storage Facility Failure**

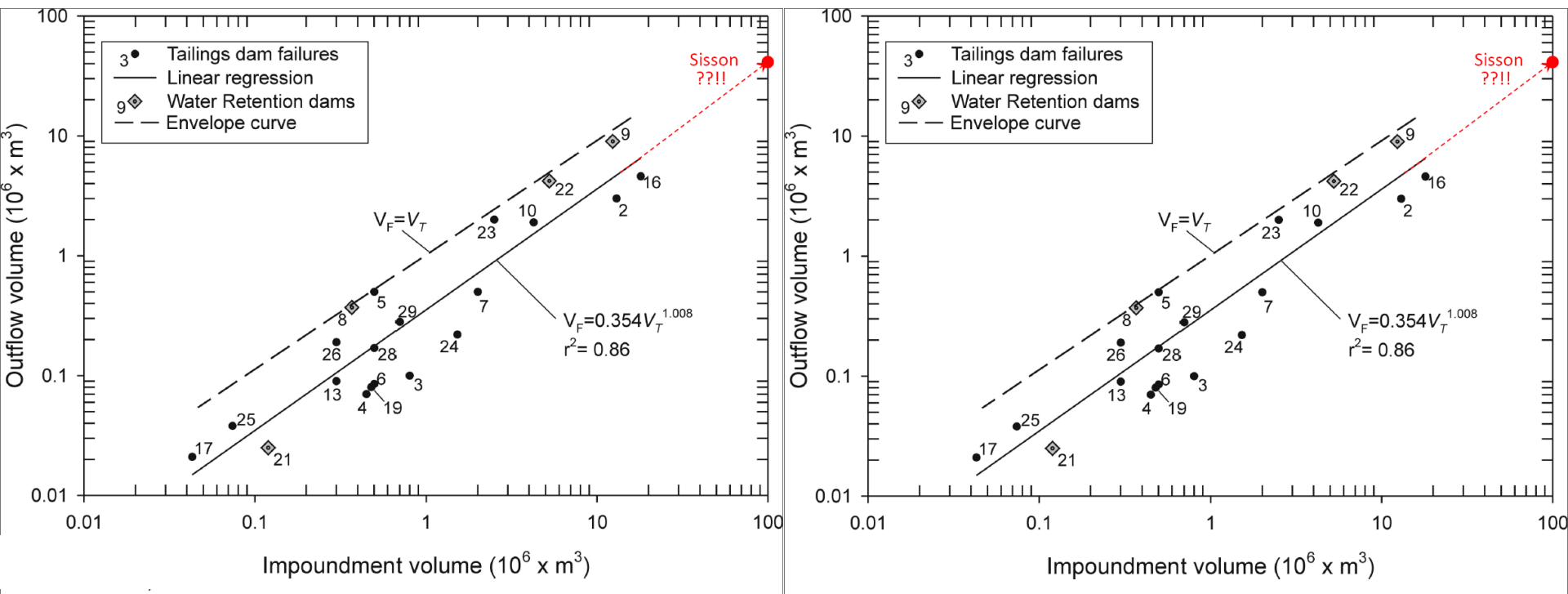
**Based on assumptions derived from historical findings in Rico et al (2007).**

*Rico, M. Benito, G., Díez-Herrero. 2008. Floods from tailings dam failures. J Hazard Material. 154(1-3):79-87. Epub 2007 Oct 2. <http://www.ncbi.nlm.nih.gov/pubmed/18096316> Accessed 25 May, 2015.*

**DEM: Service New Brunswick**  
**Aerial Photo: Service New Brunswick**  
**Model Software**

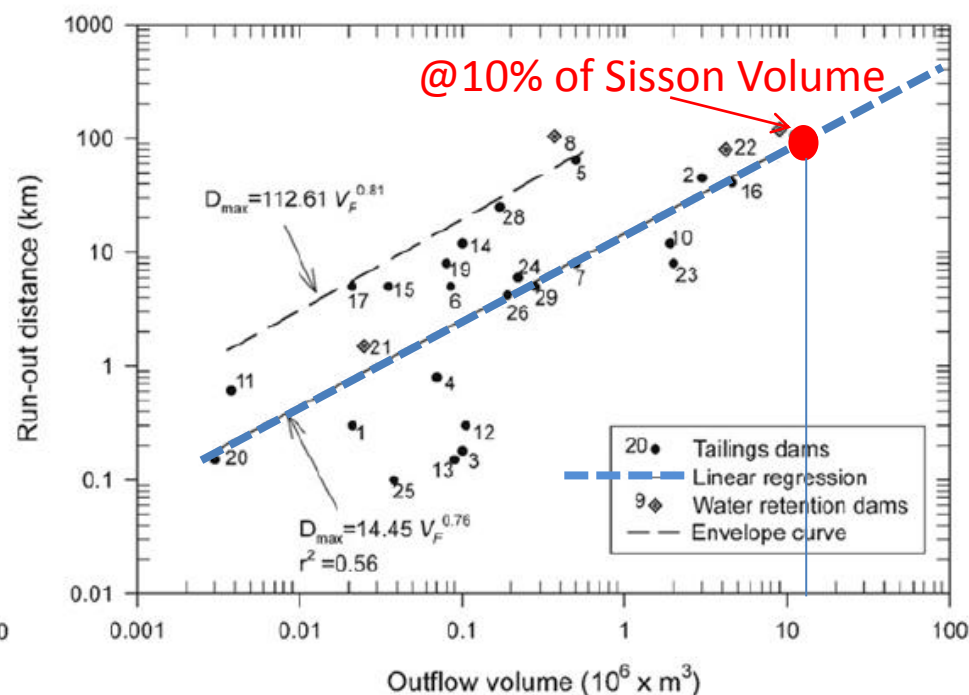
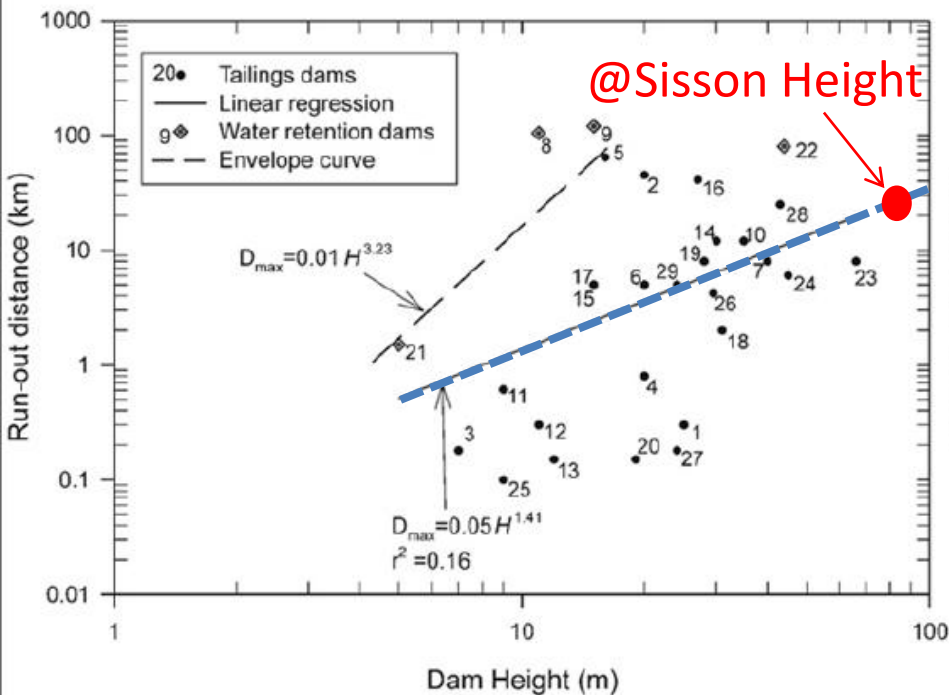
*National Center for Computational Hydroscience and Engineering CCHE2D:Two-dimensional Hydrodynamic and Sediment Transport Model For Unsteady Open Channel Flows Over Loose Bed Technical Report No. NCCHE-TR-2001-1 Feb. 30 ,2001 Yafei Jia and Sam S.Y. Wang. School of Engineering The University of Mississippi, MS 38677*

**Model compiled by Lawrence Wuest**



***Historical data and the proponent's own EIA report show that a failure at Sisson will likely result in an outflow of tens of millions of cubic metres of water plus eroded tailings at over twice the severity of Mount Polley.***

Graphs From: Rico, M. Benito, G., Díez-Herrero. 2008. Floods from tailings dam failures. *J Hazard Material*. 154(1-3):79-87. Epub 2007 Oct 2. <http://www.ncbi.nlm.nih.gov/pubmed/18096316> Accessed 25 May, 2015.



**Historical data and the proponent's own EIA report show that a failure at Sisson will likely run out tens of kilometres down the Nashwaak Watershed.**

Graphs From: Rico, M. Benito, G., Díez-Herrero. 2008. Floods from tailings dam failures. J Hazard Materials. 154(1-3):79-87. Epub 2007 Oct 2. <http://www.ncbi.nlm.nih.gov/pubmed/18096316> Accessed 25 May, 2015.





0 hr 00 min



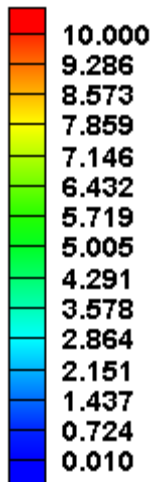


Model Credit: National Center for Computational Hydroscience and Engineering CCHE2D:Two-dimensional Hydrodynamic and Sediment Transport Model For Unsteady Open Channel Flows Over Loose Bed Technical Report No. NCCHE-TR-2001-1 Feb. 30 ,2001 Yafei Jia and Sam S.Y. Wang. School of Engineering The University of Mississippi, MS 38677



## LEGEND

Water Depth m.



Flood reaches the Nashwaak at 51 minutes  
Downstream is a narrow valley  
Upstream is a level basin

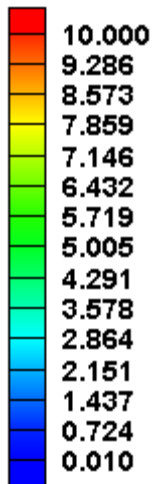
Time = 0(d): 0(h): 51(m): 48.3801(s)





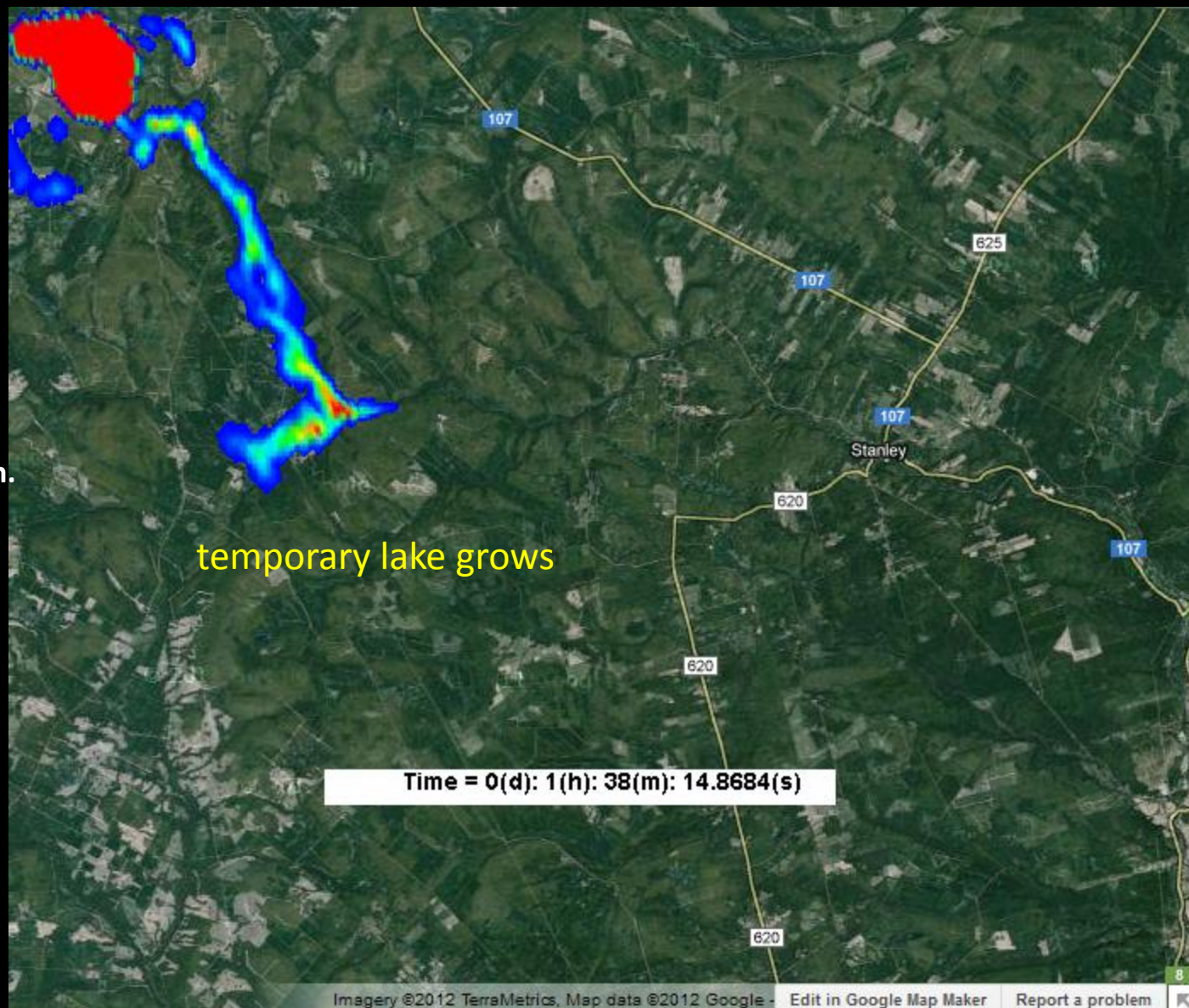
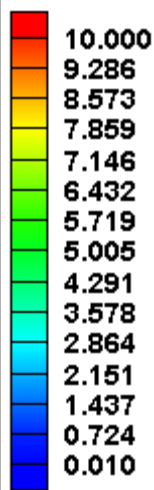
**LEGEND**

Water Depth m.



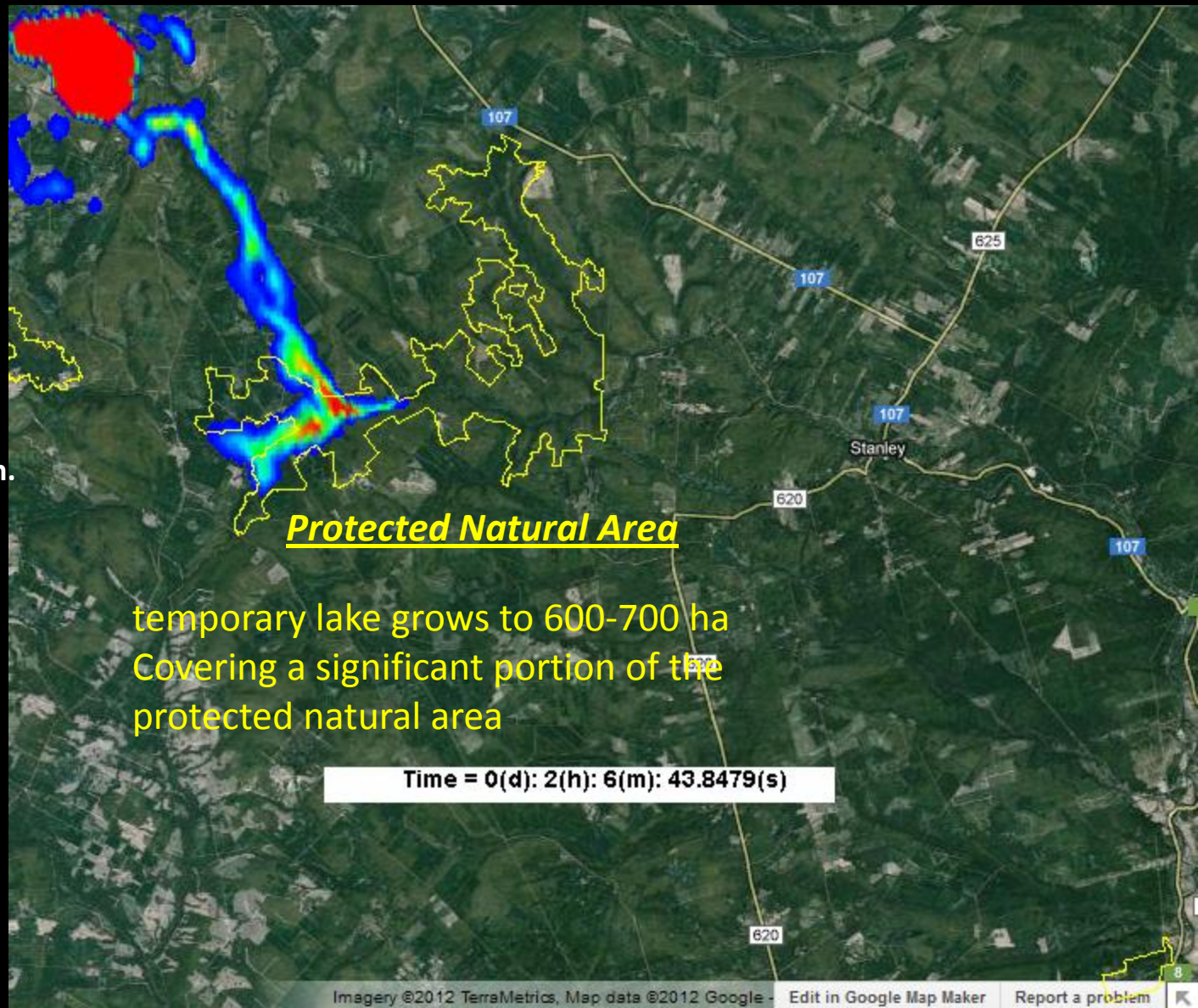
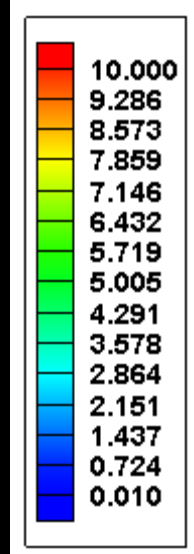


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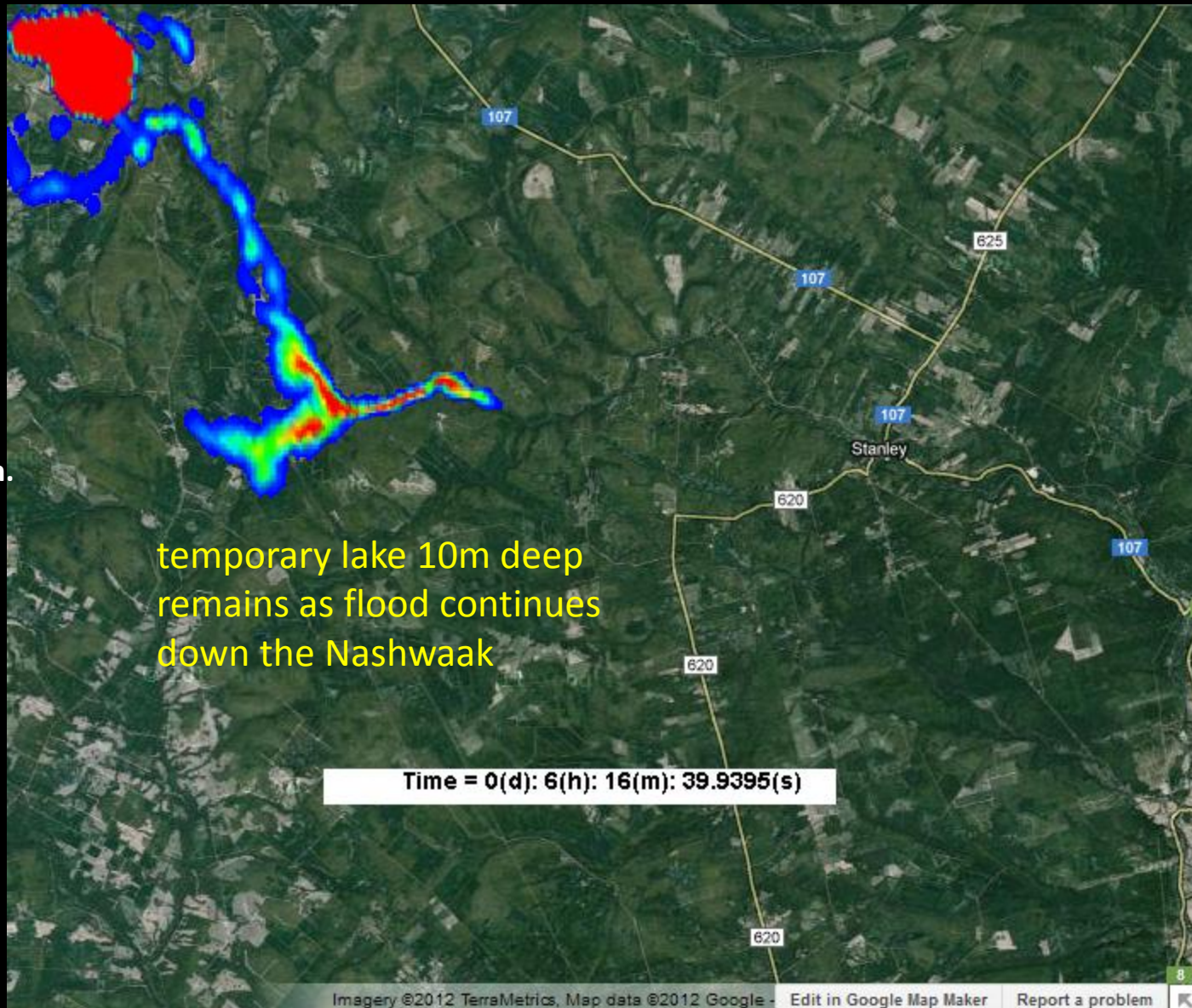




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Water Depth m.

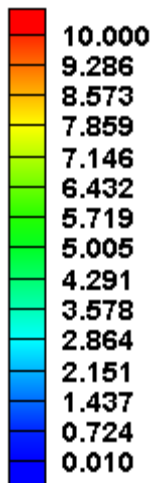






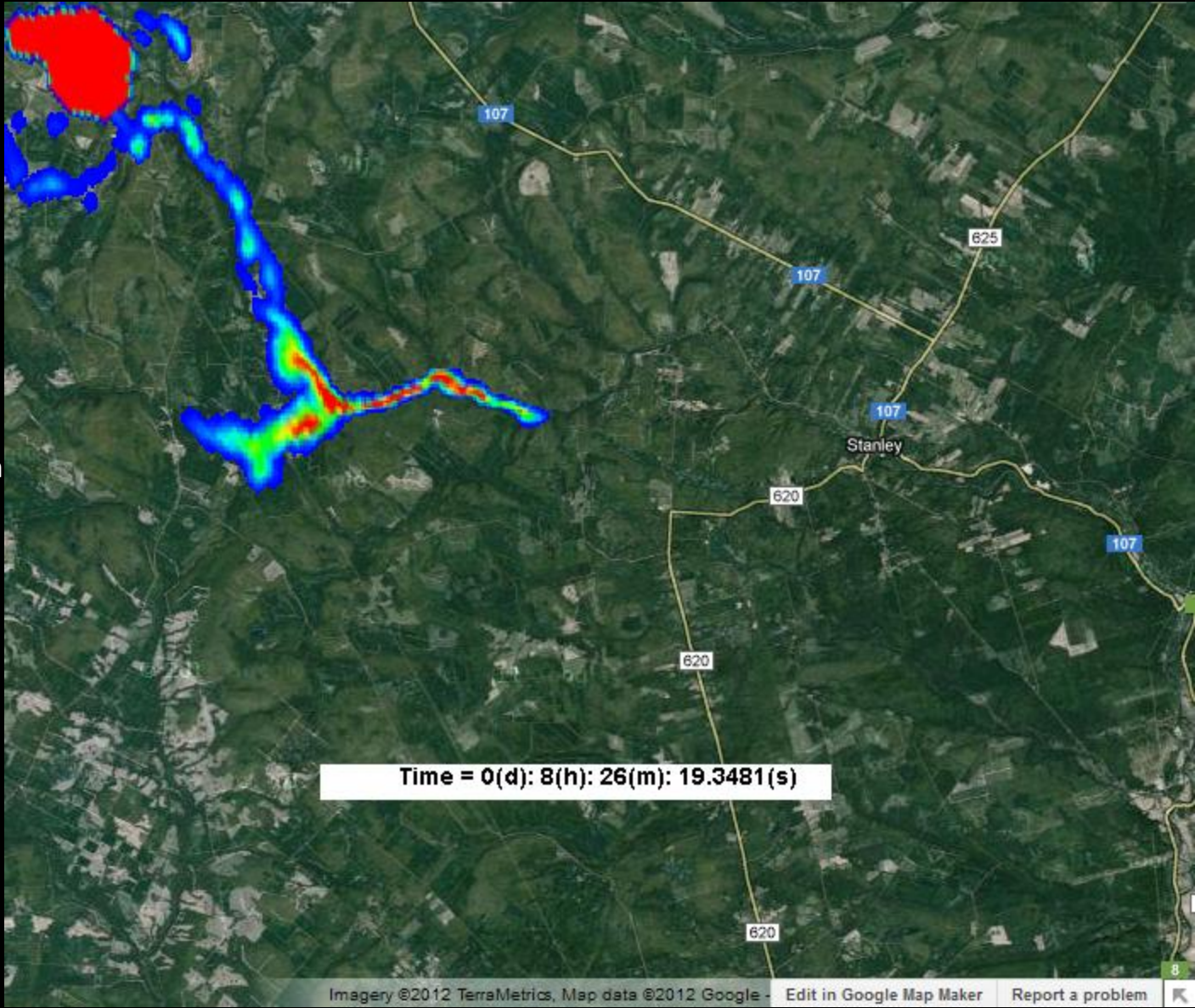
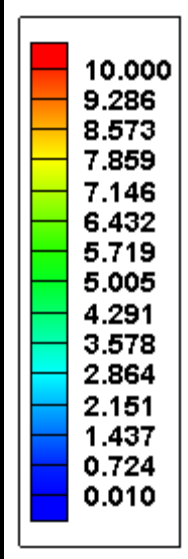
# LEGEND

Water Depth m.



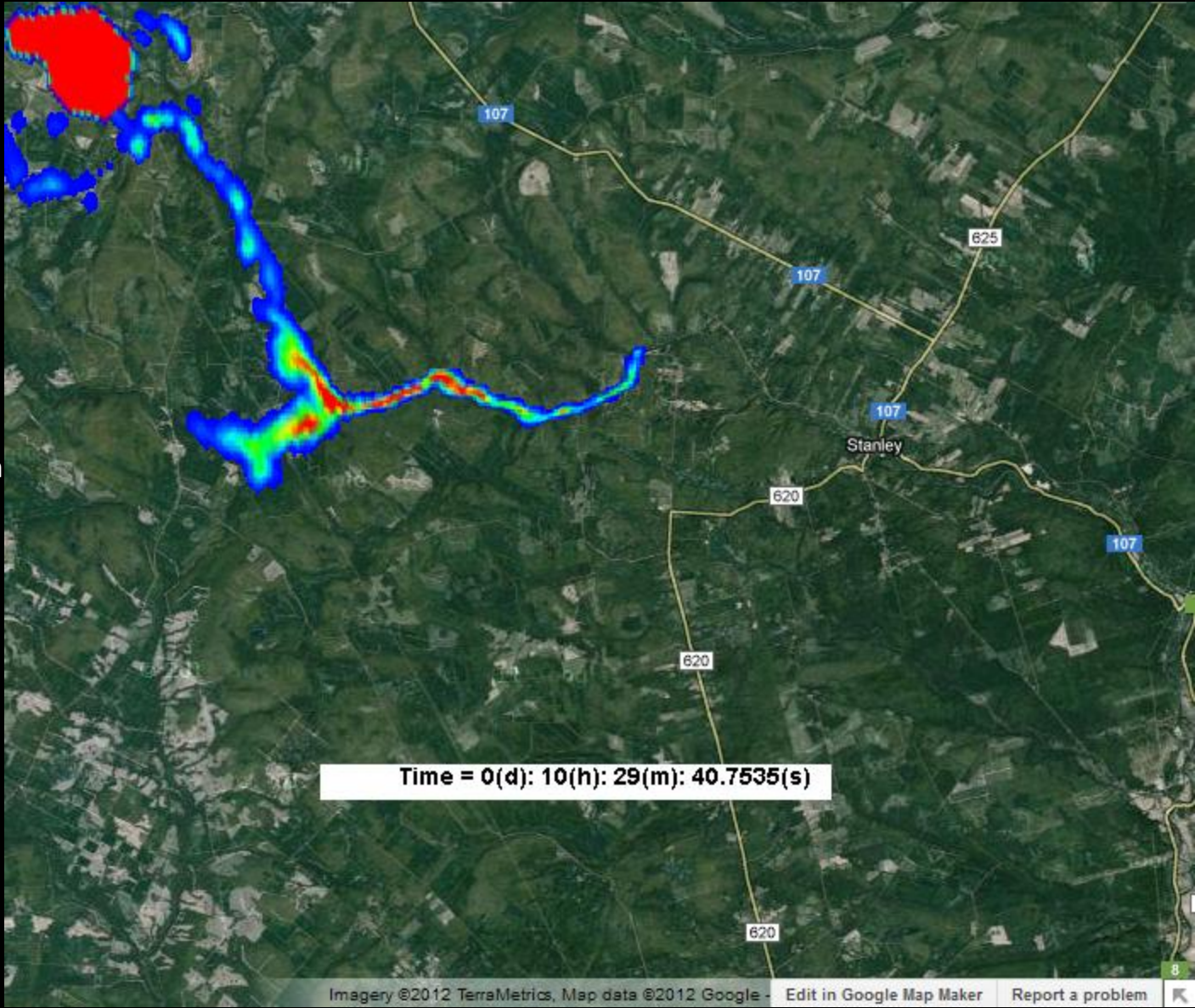
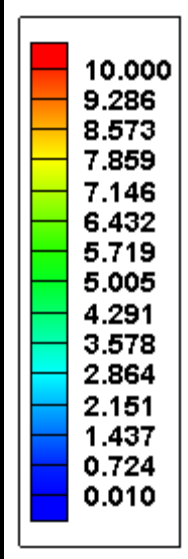


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Water Depth m



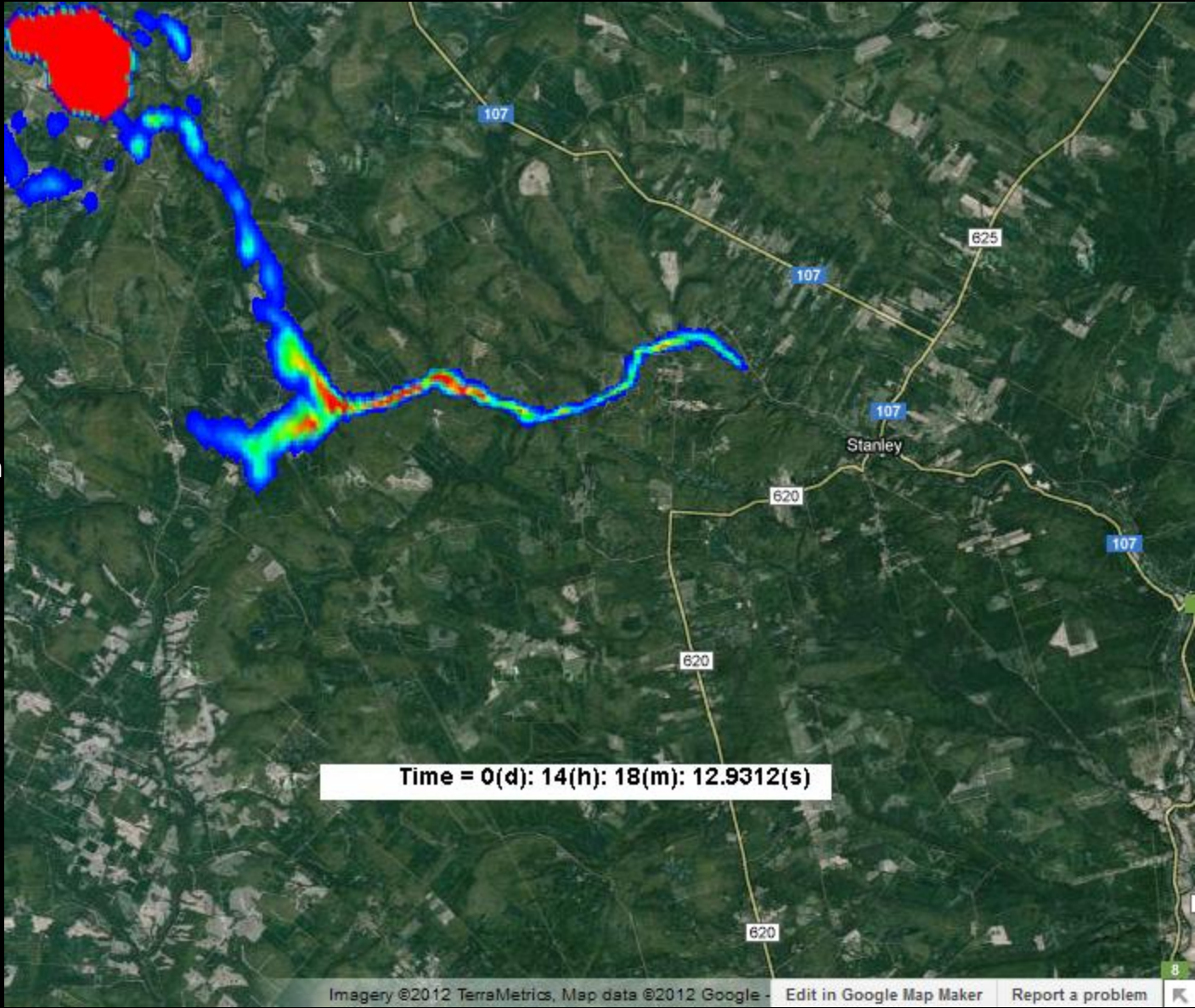
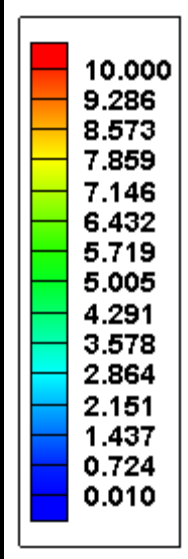


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Water Depth m



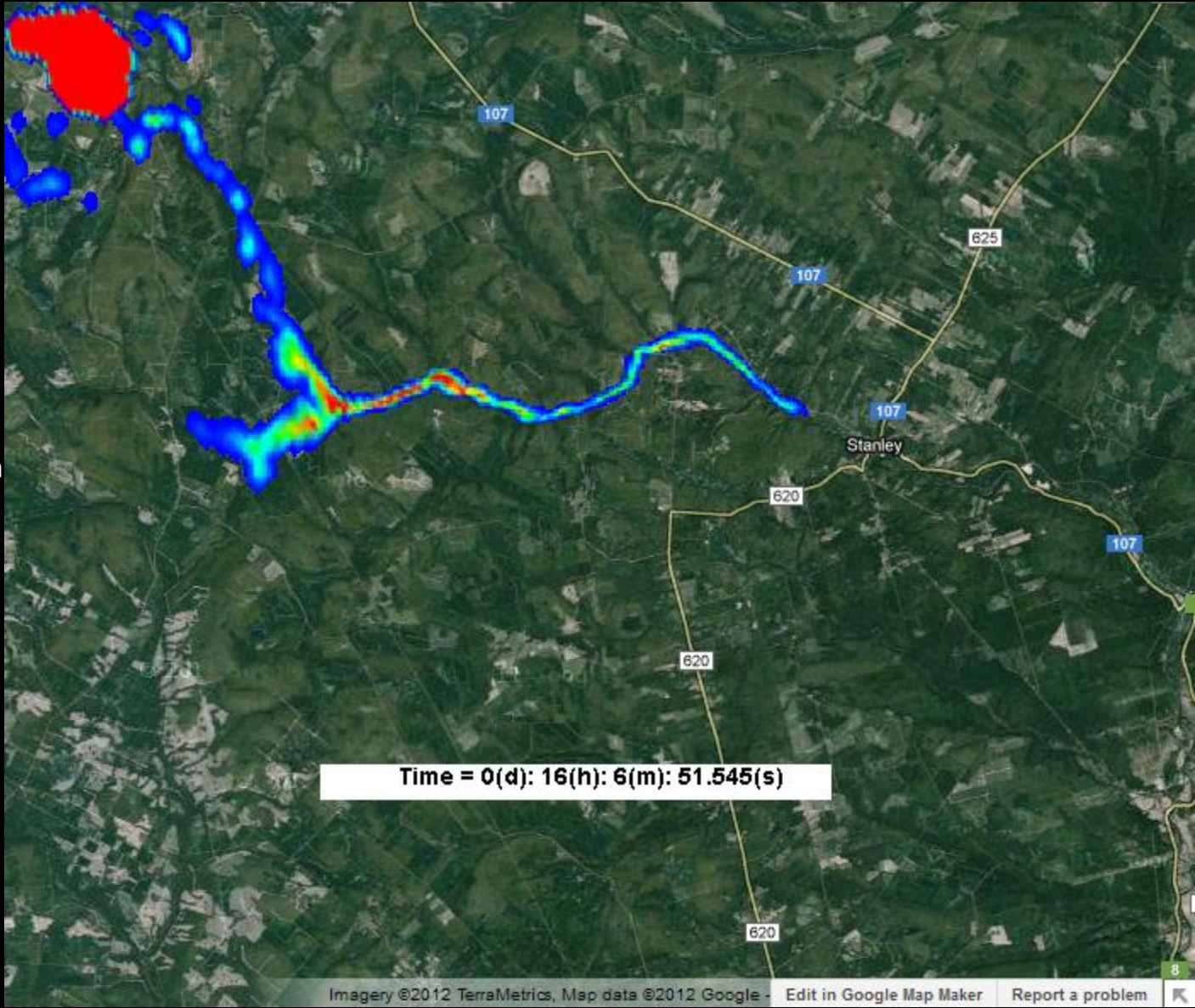
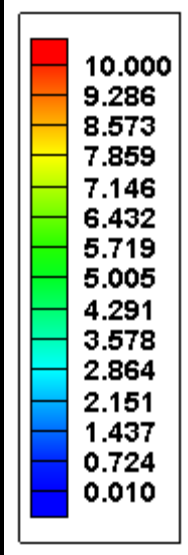


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Water Depth m



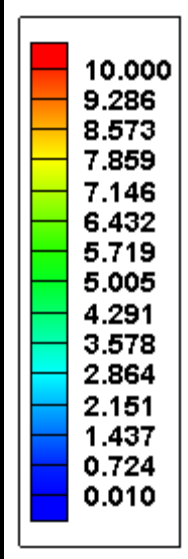


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Water Depth m





**LEGEND**  
Water Depth m



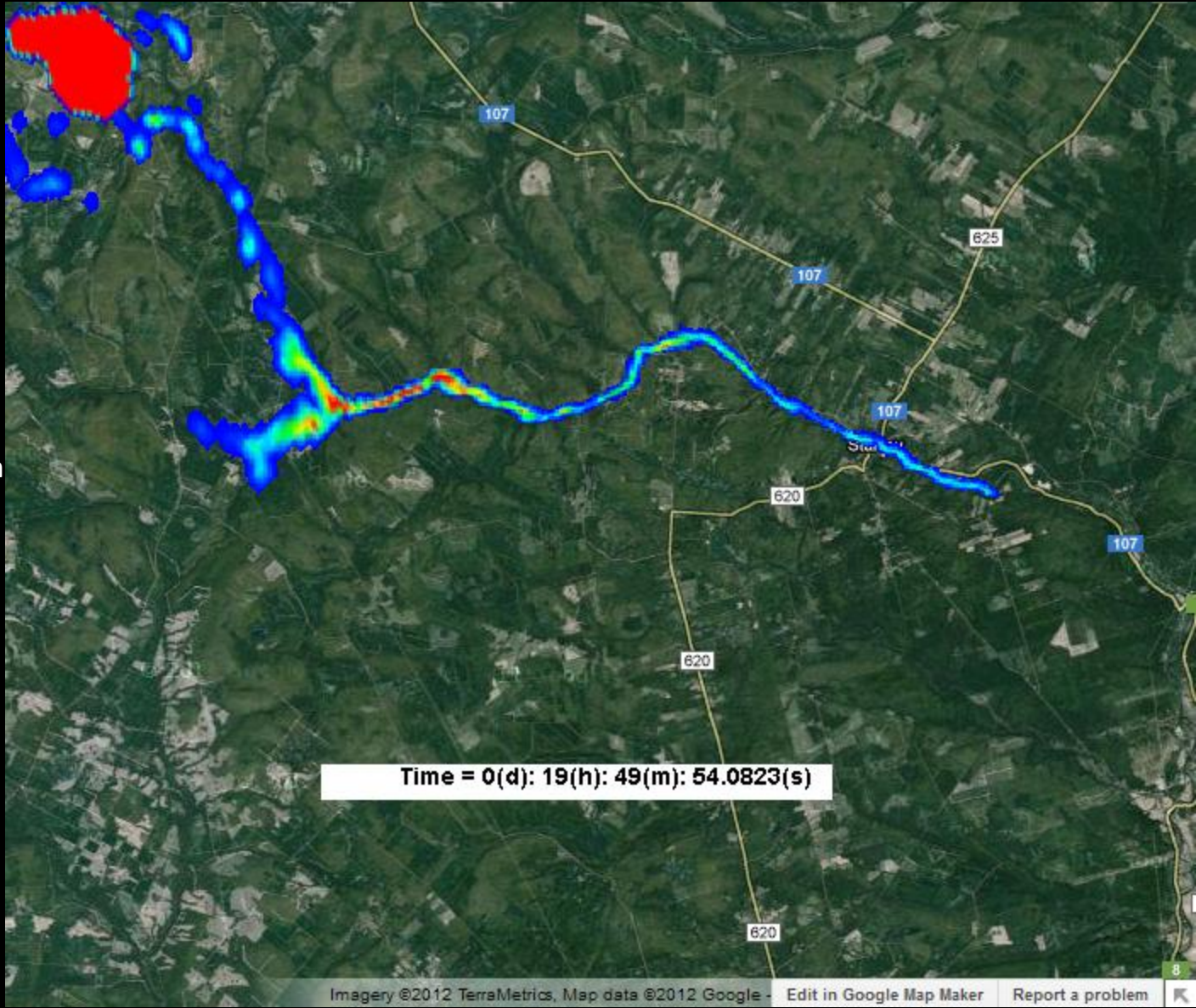
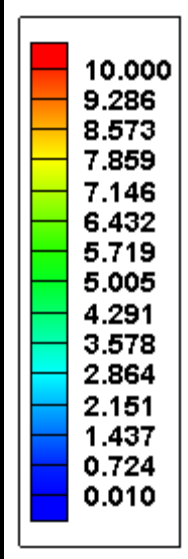
Flood reaches Stanley in 18hrs  
2-3m deep at this stage

Time = 0(d): 17(h): 56(m): 42.4006(s)



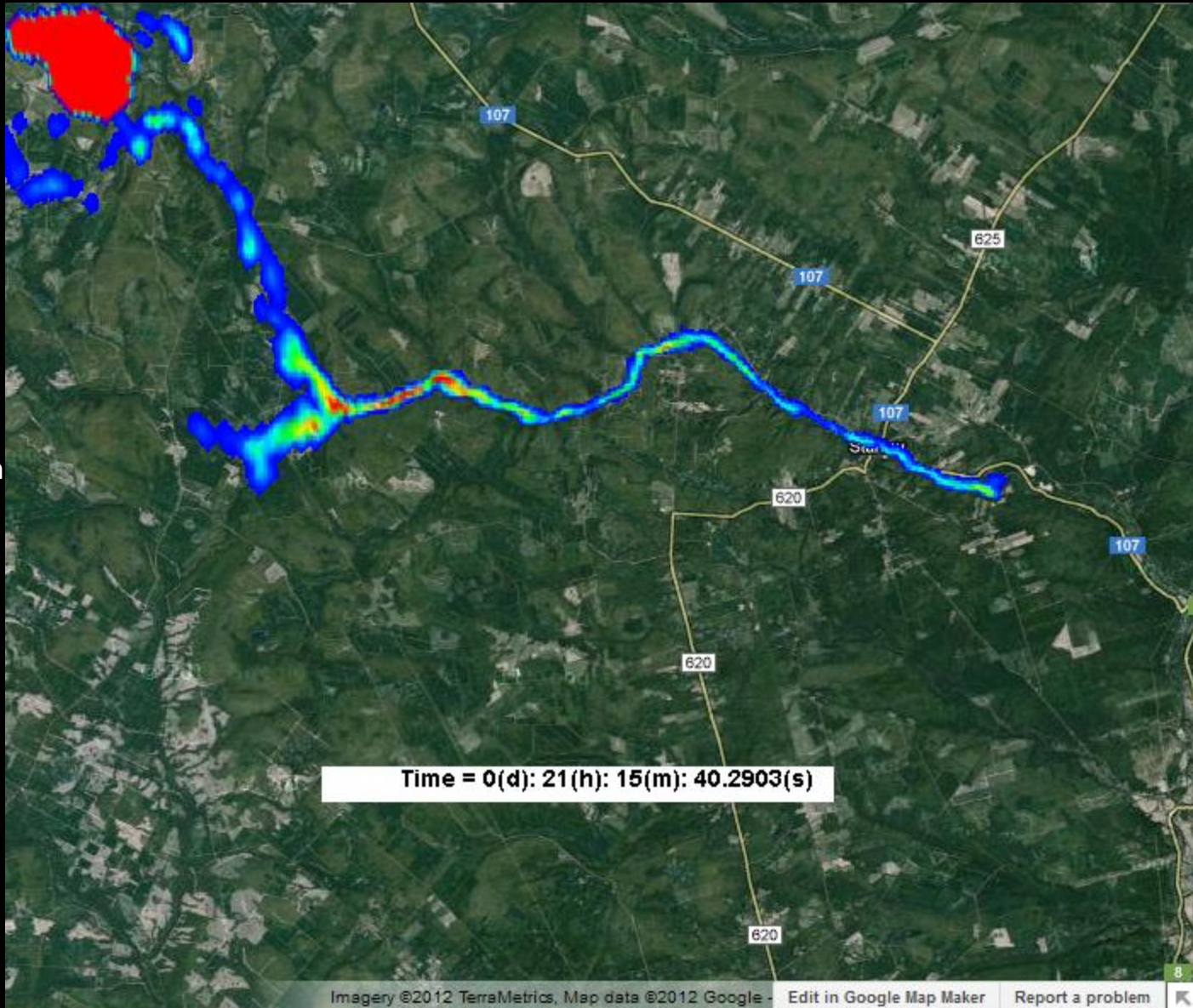
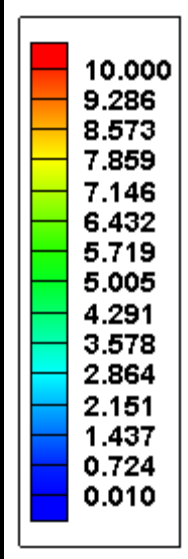


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Water Depth m



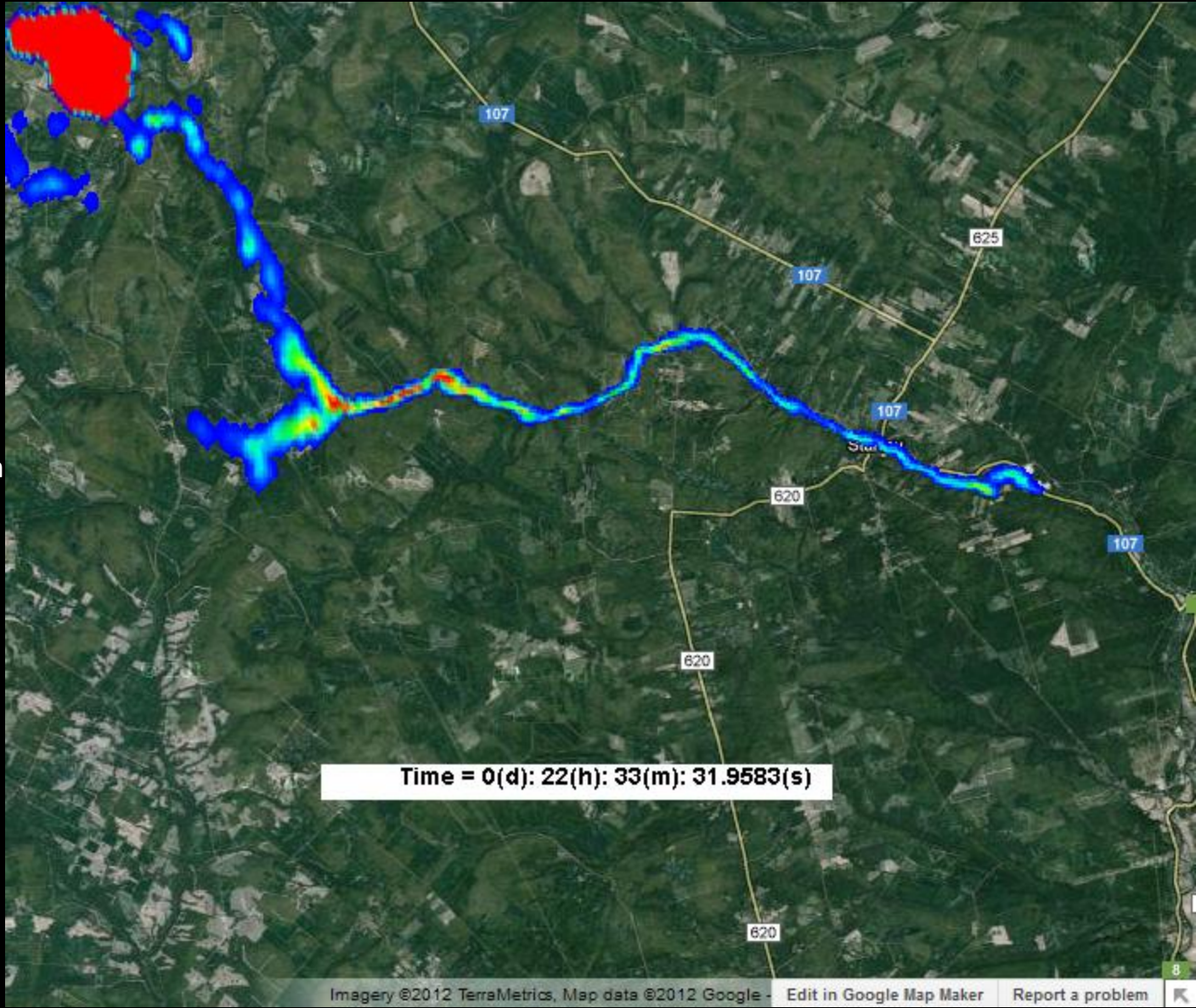
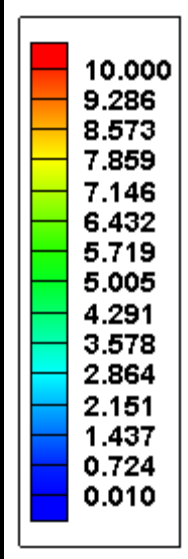


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Water Depth m



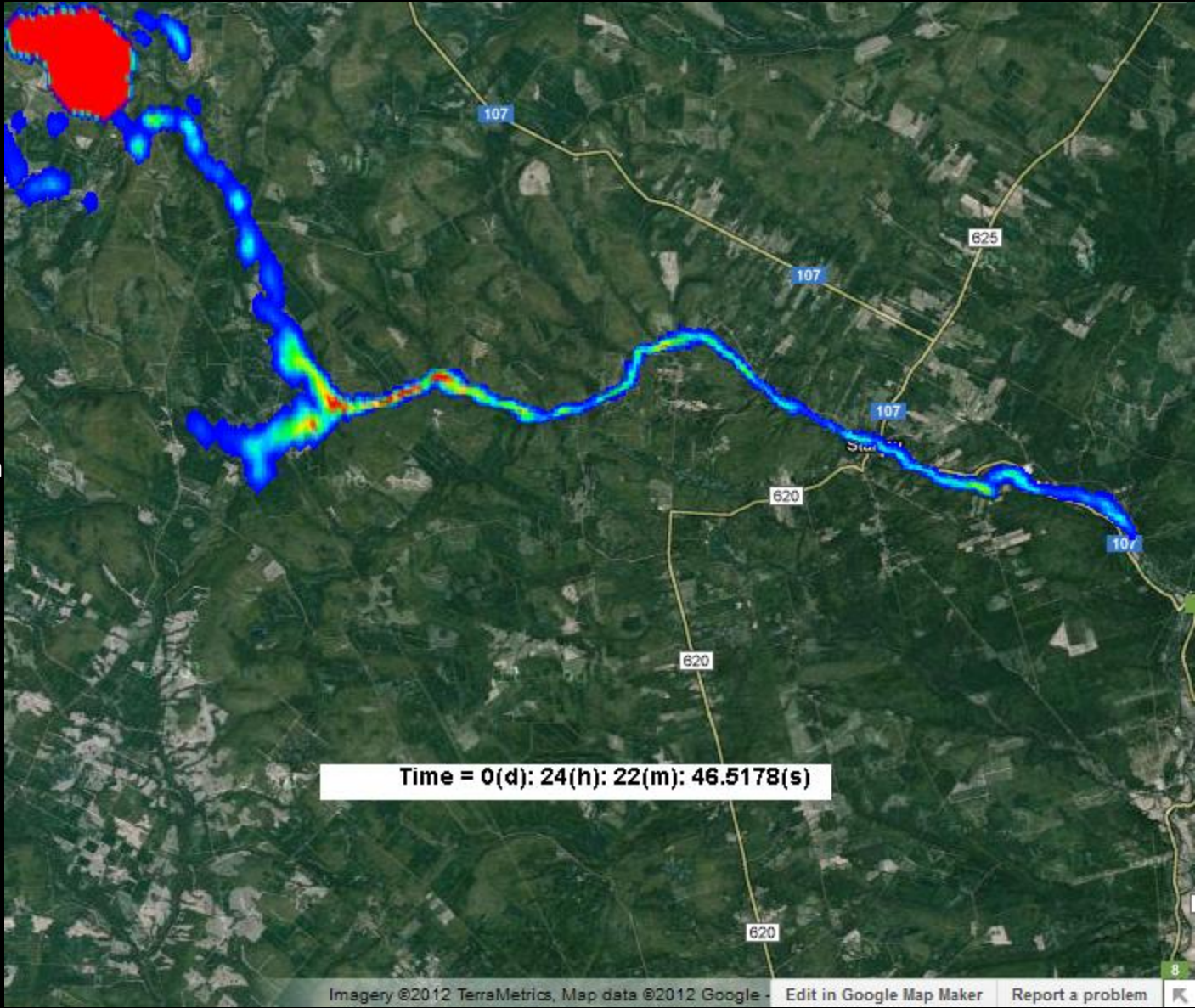
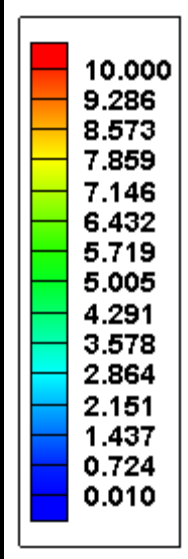


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Water Depth m



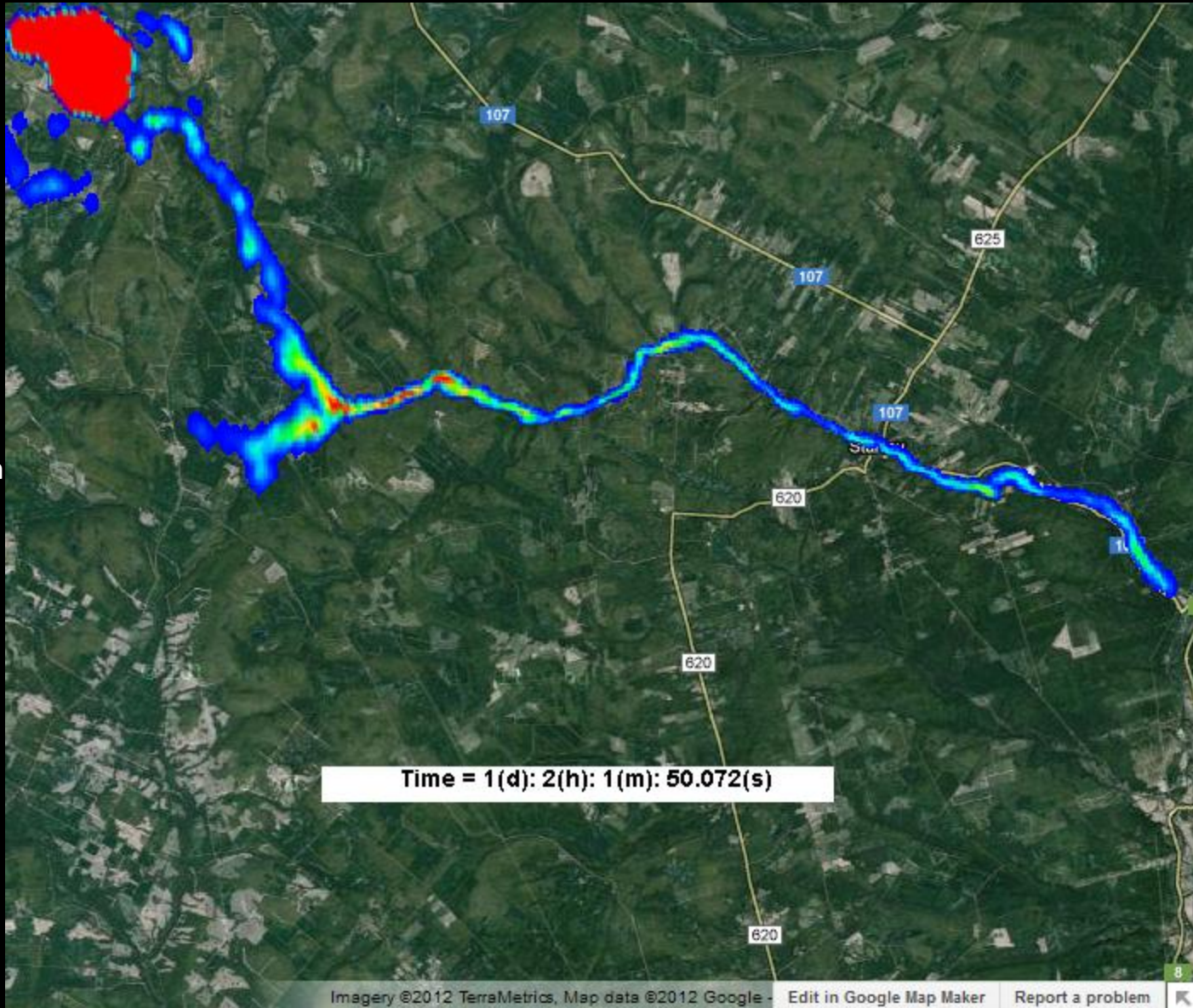
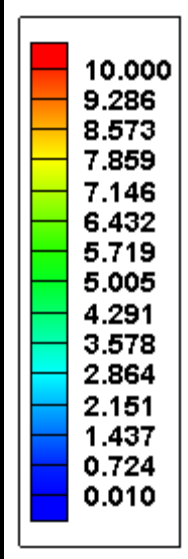


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Water Depth m



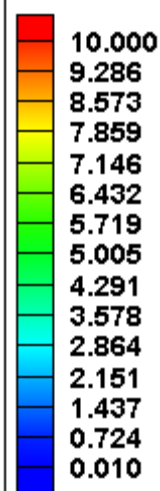


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Water Depth m



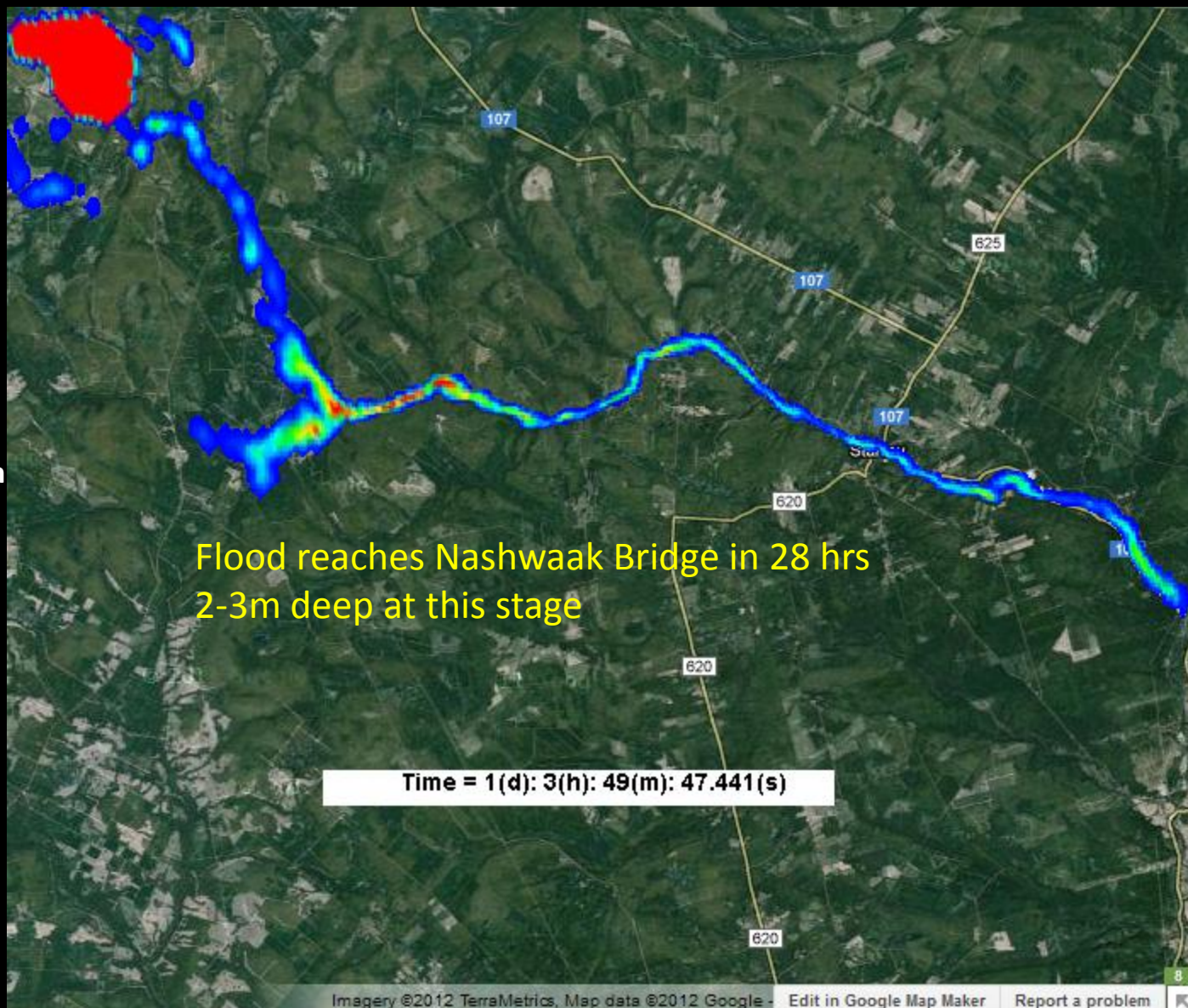


**LEGEND**  
Water Depth m



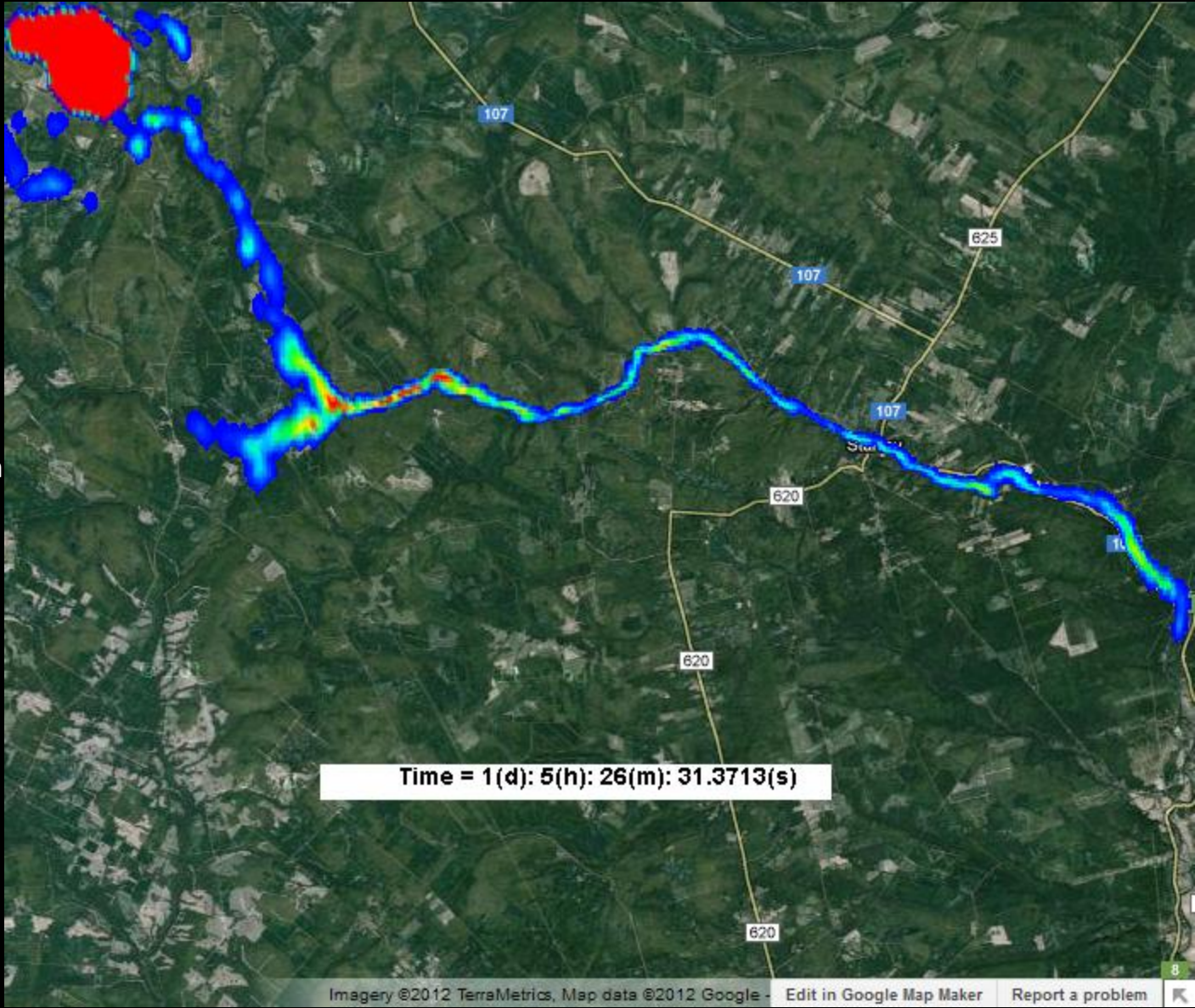
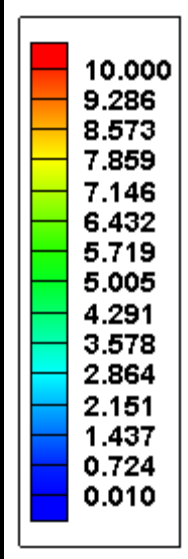
Flood reaches Nashwaak Bridge in 28 hrs  
2-3m deep at this stage

Time = 1(d): 3(h): 49(m): 47.441(s)



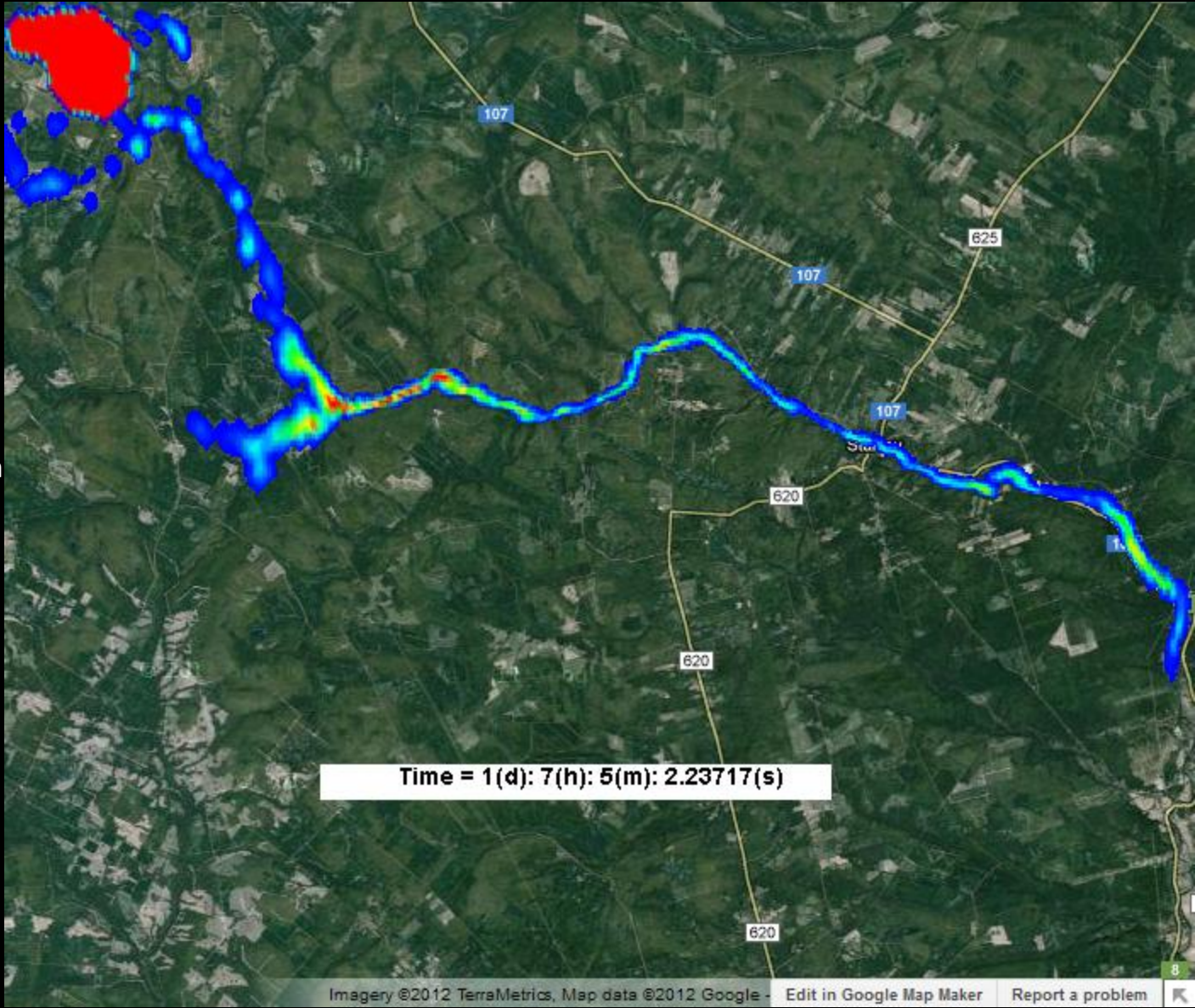
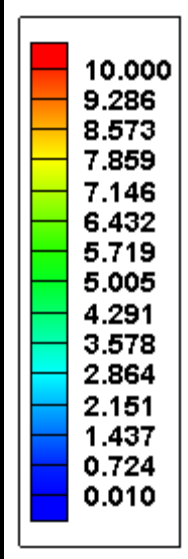


**LEGEND**  
Water Depth m



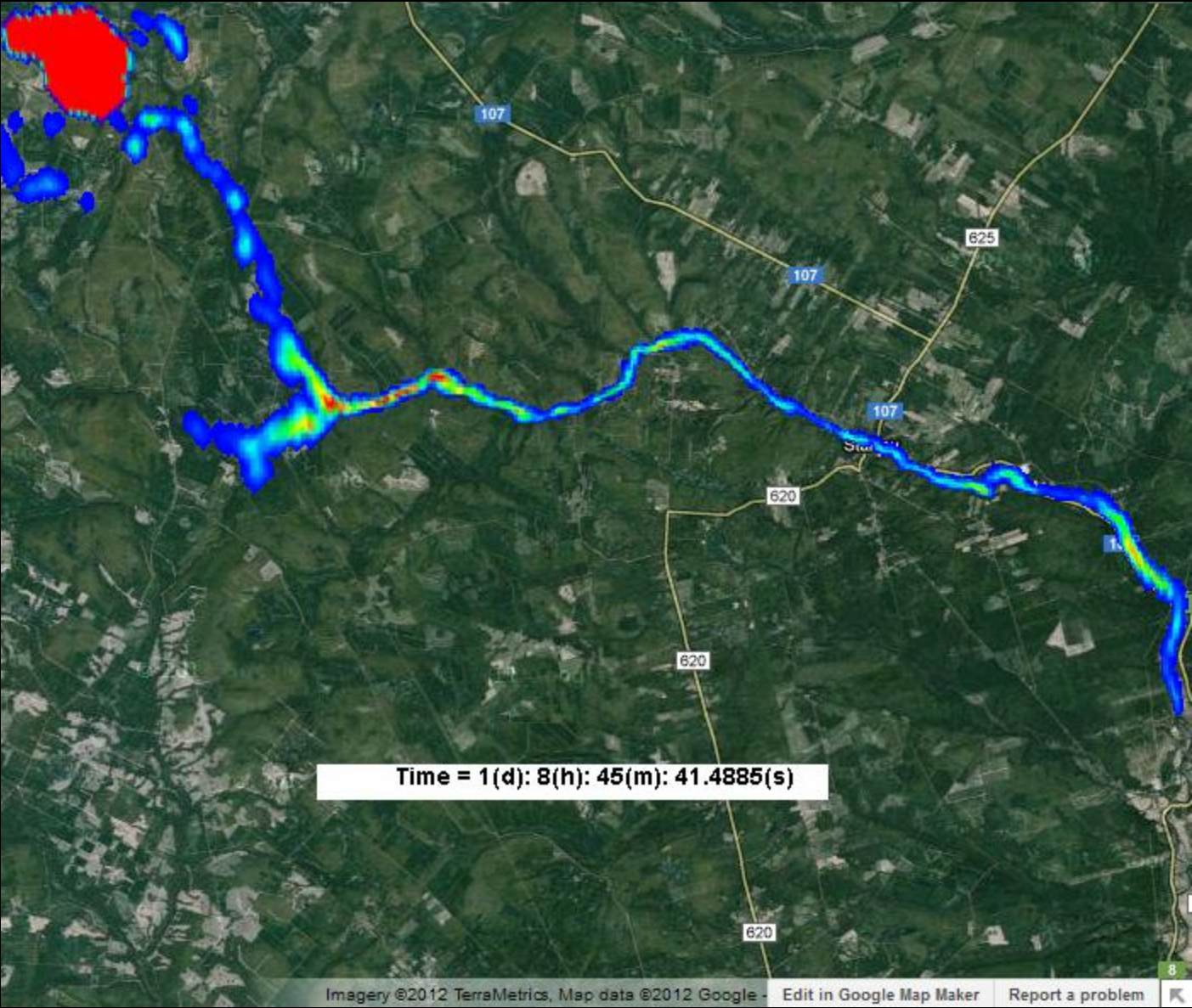
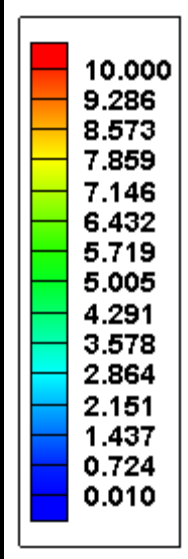


**LEGEND**  
Water Depth m



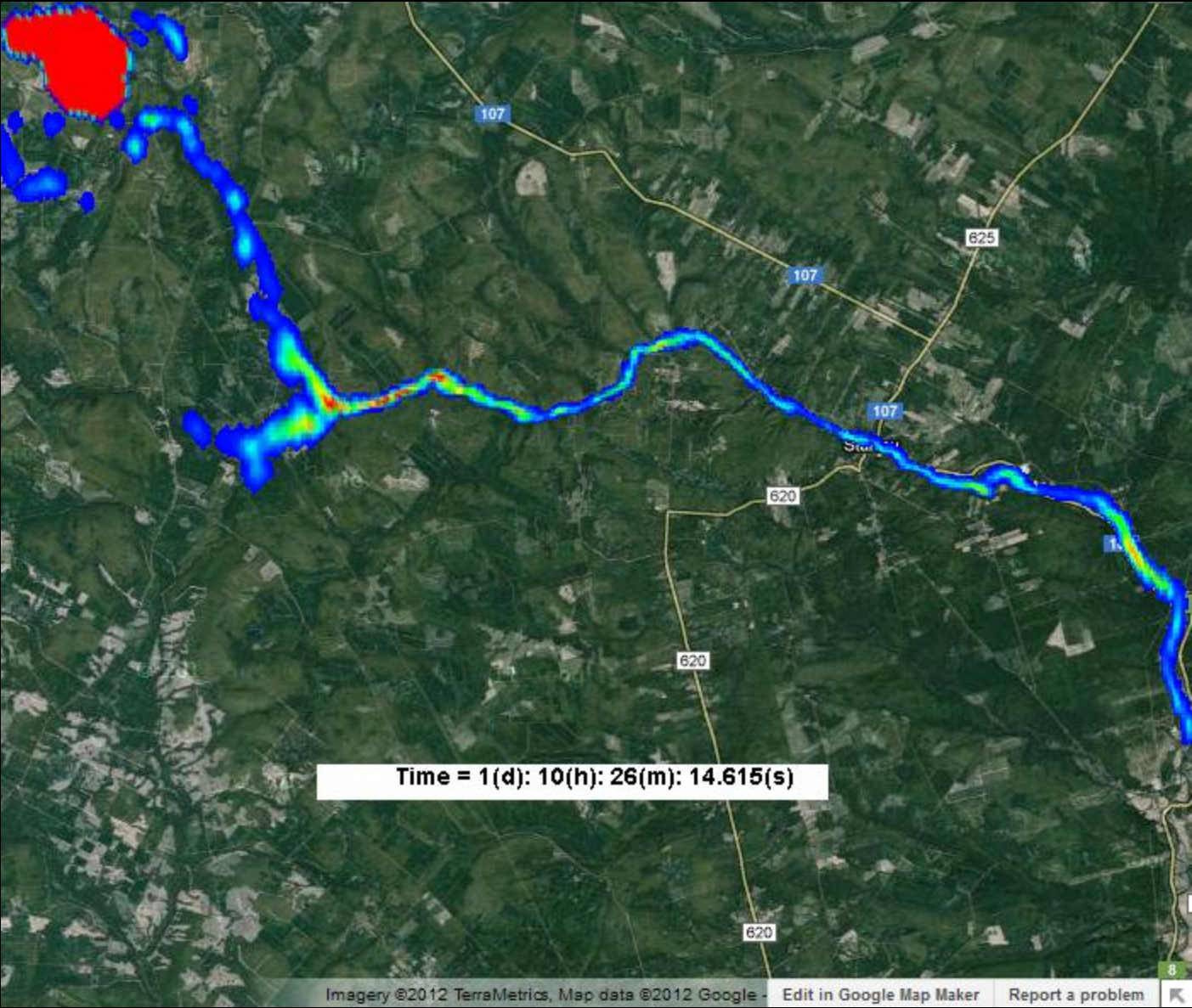
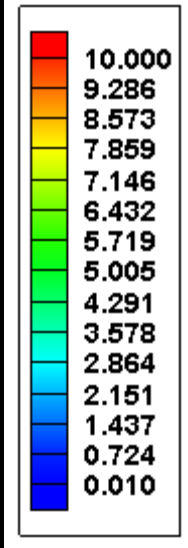


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Water Depth m



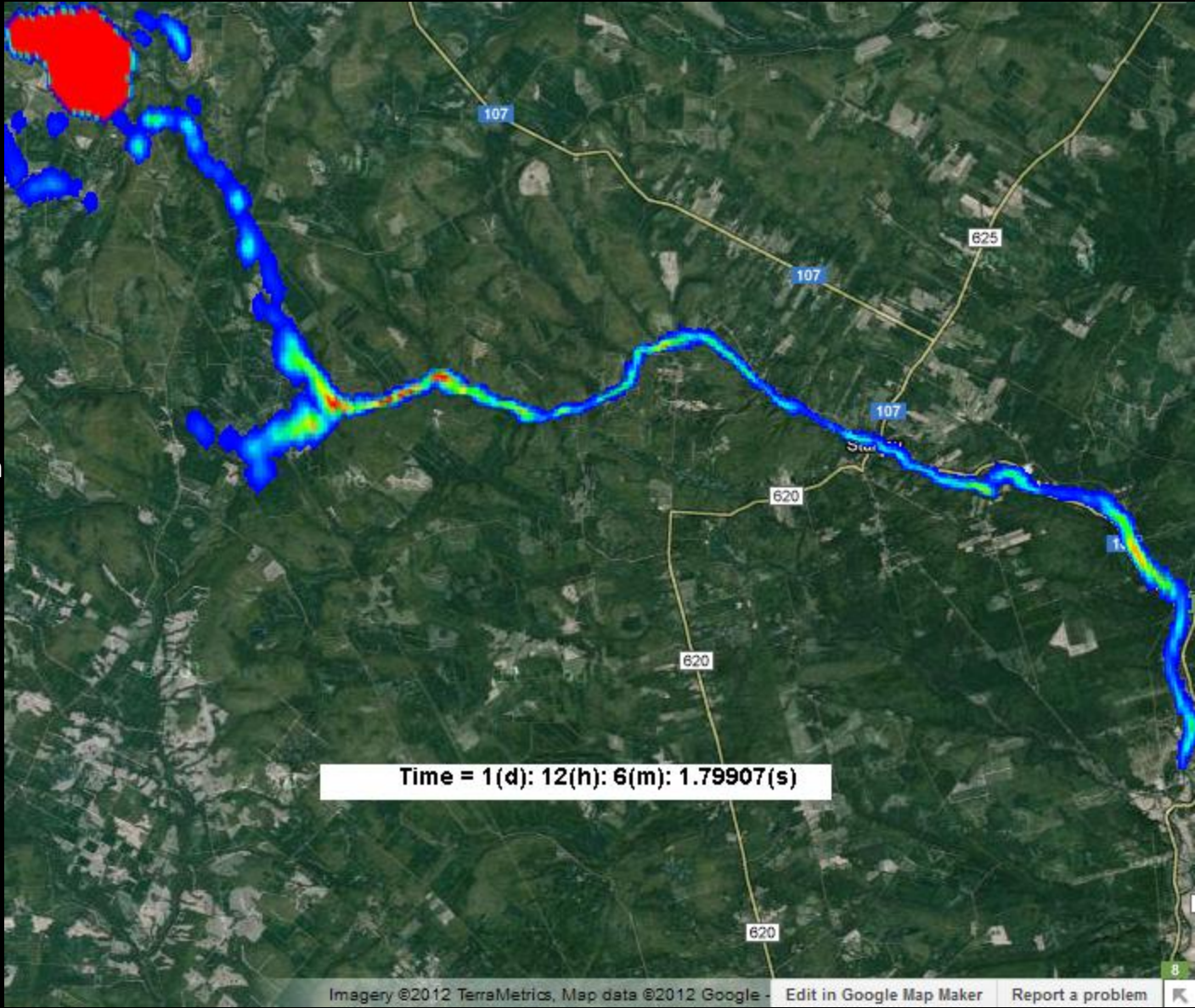
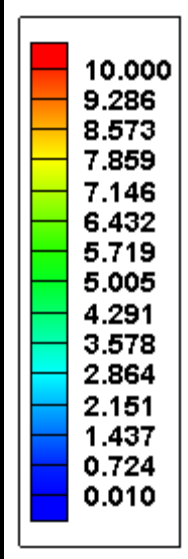


**LEGEND**  
Water Depth m



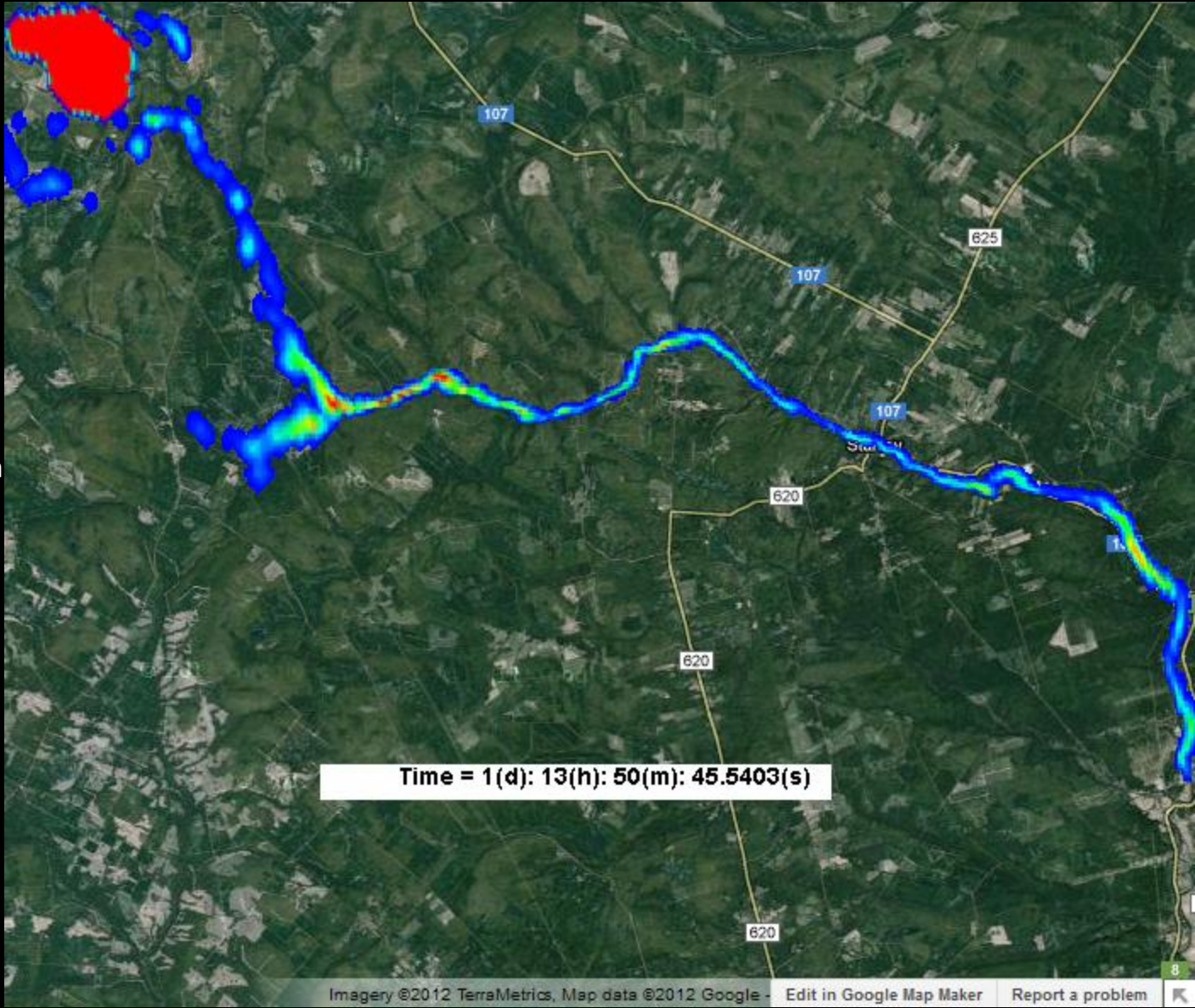
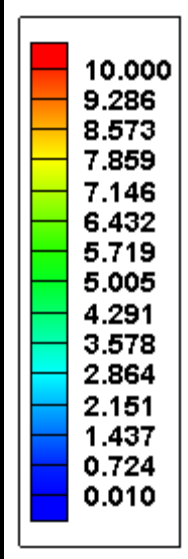


**LEGEND**  
Water Depth m



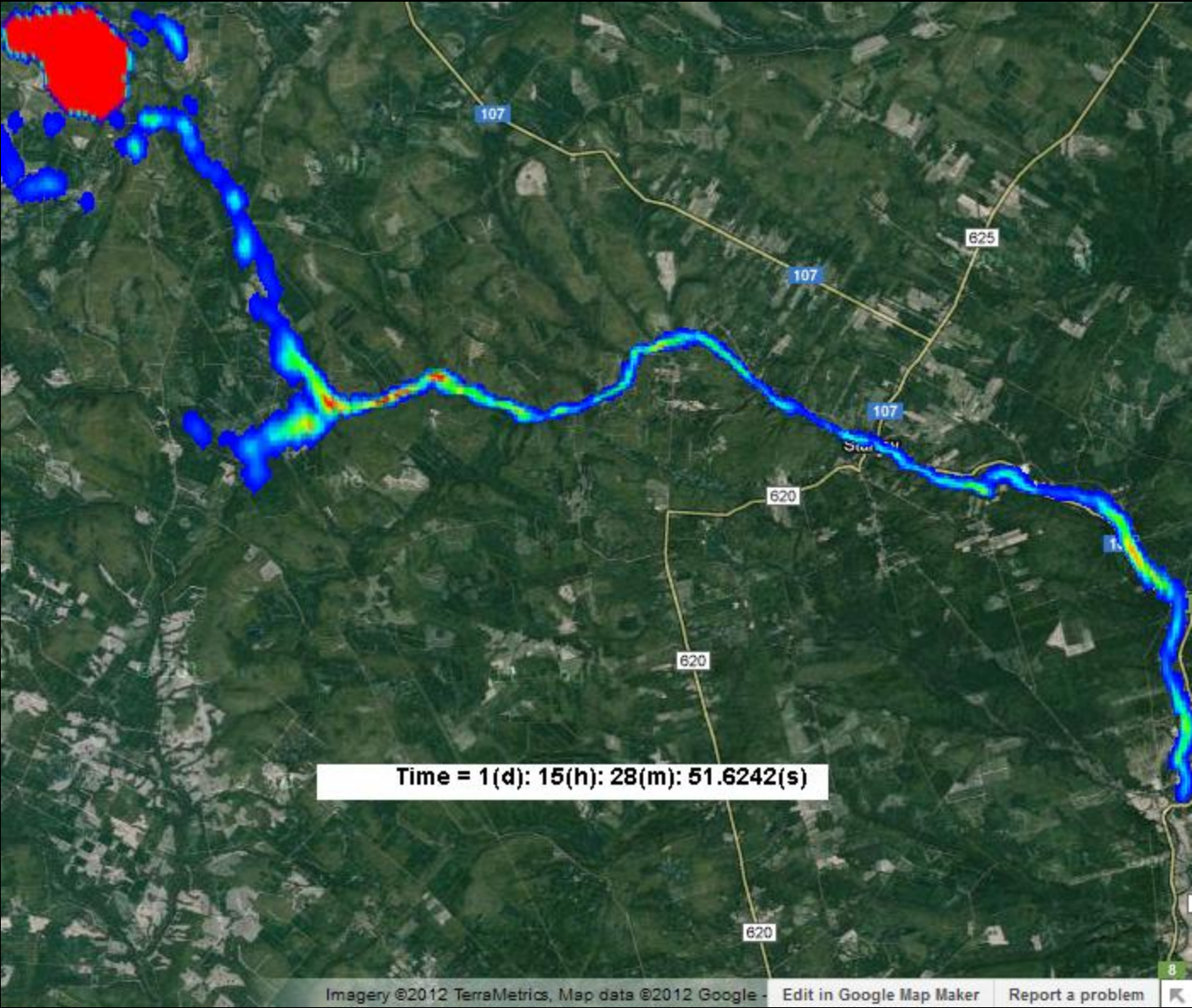
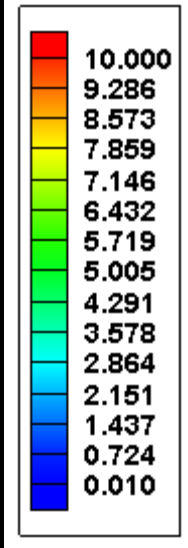


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Water Depth m



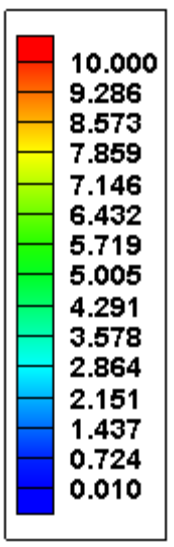


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Water Depth m



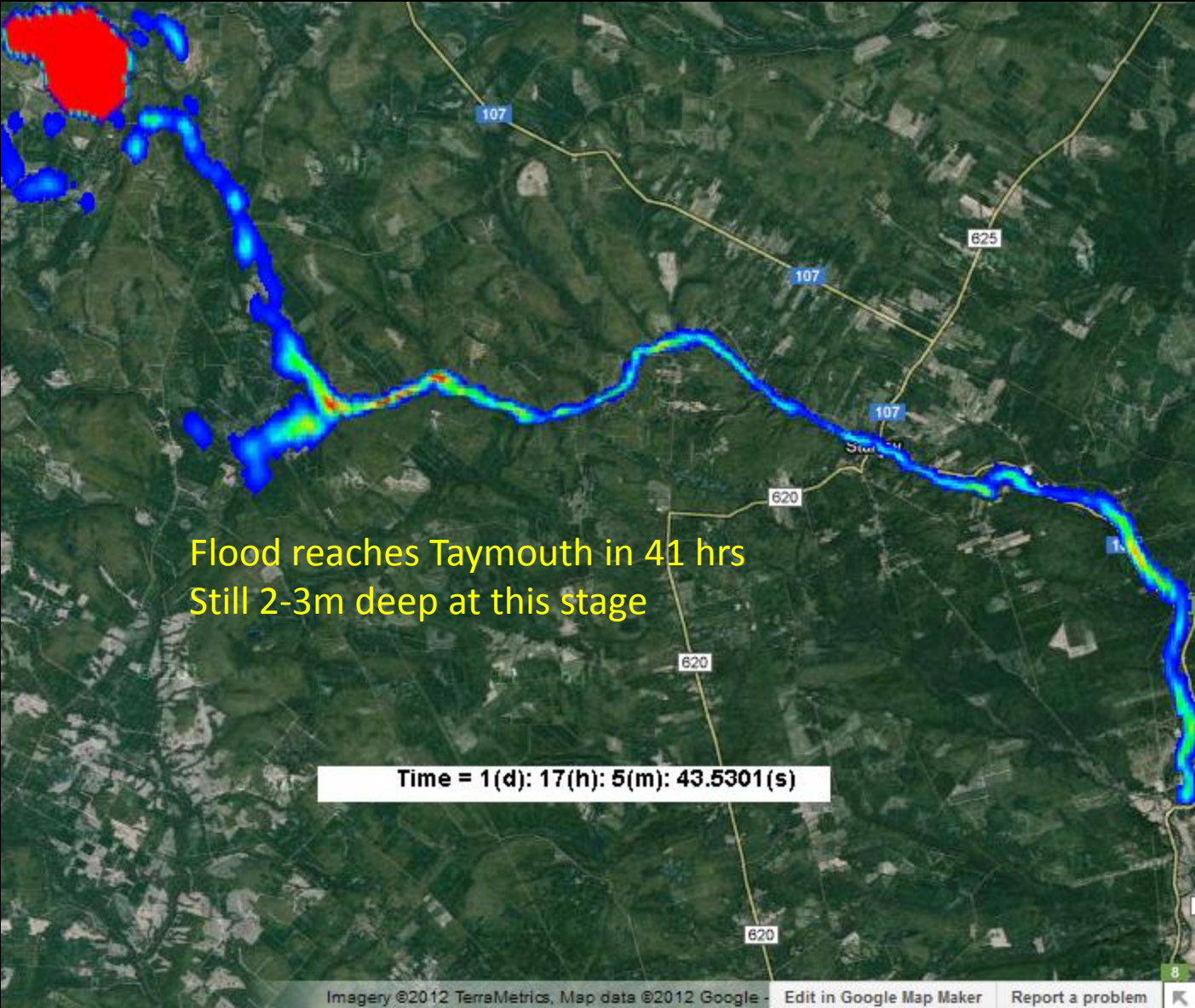


**LEGEND**  
Water Depth m



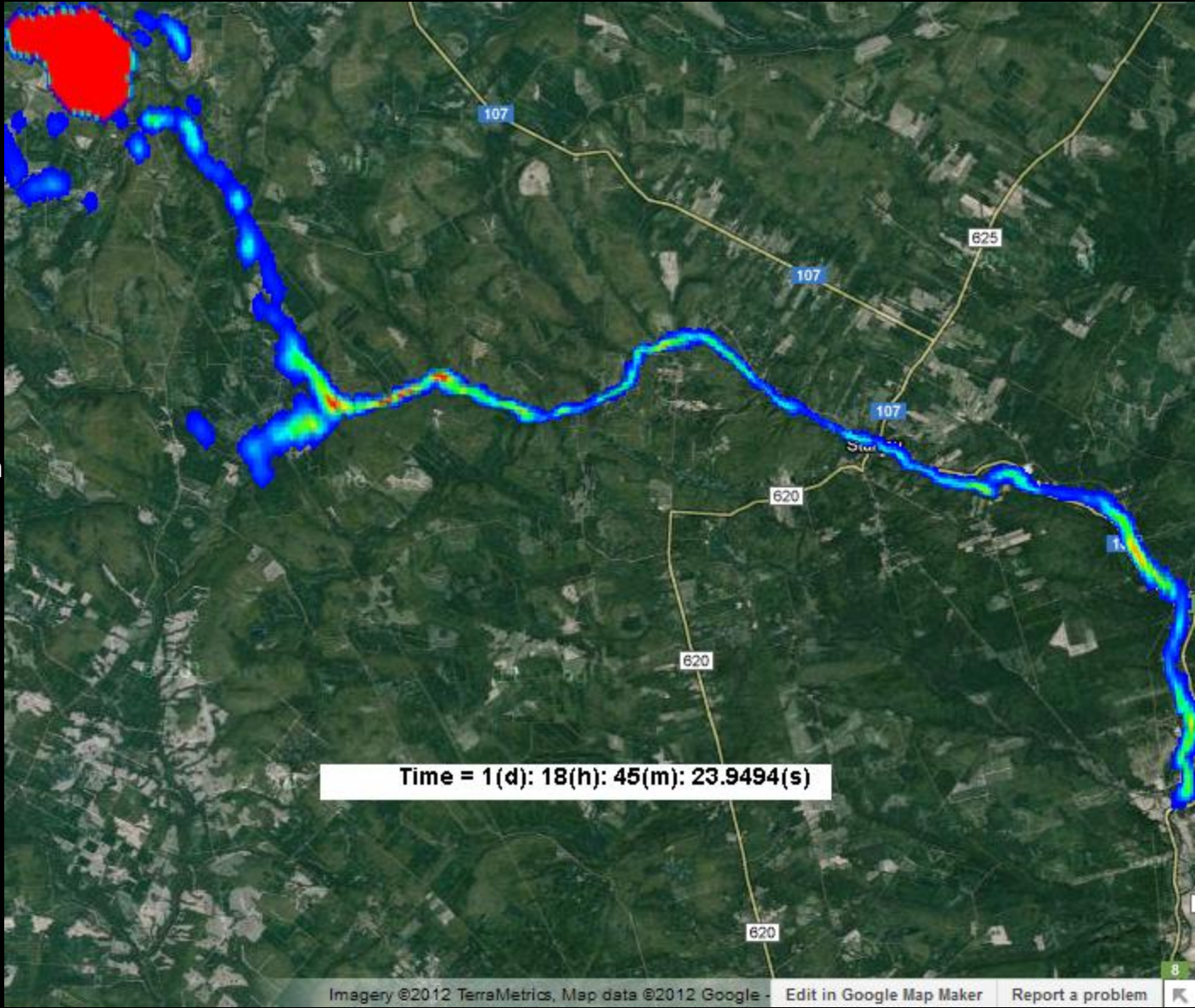
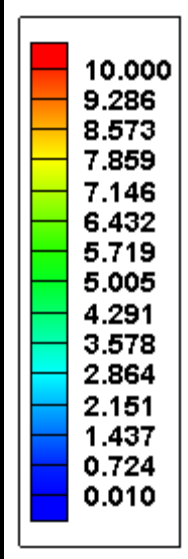
Flood reaches Taymouth in 41 hrs  
Still 2-3m deep at this stage

Time = 1(d): 17(h): 5(m): 43.5301(s)



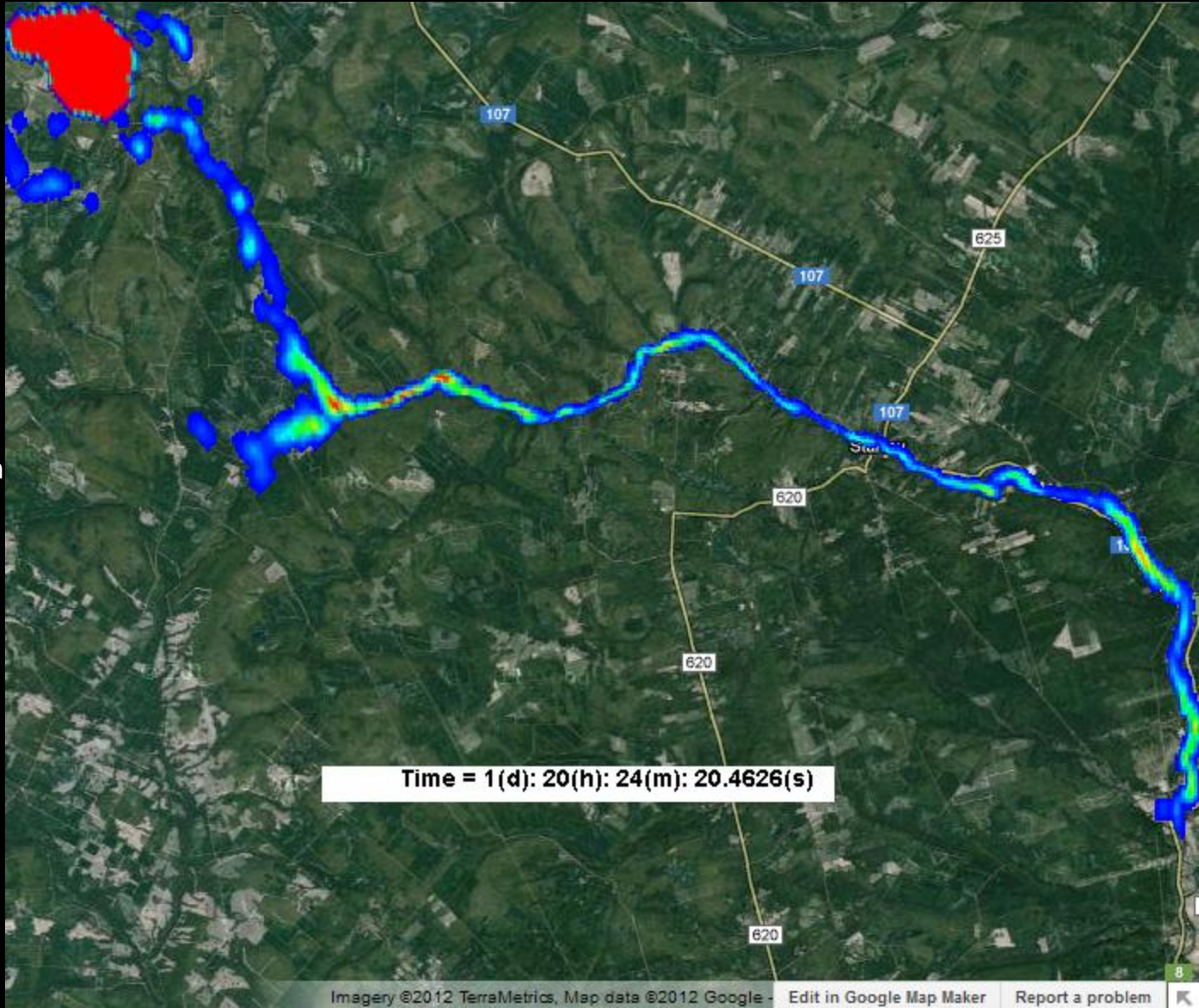
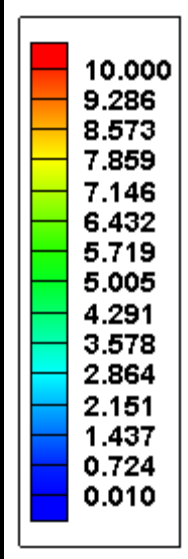


**LEGEND**  
Water Depth m



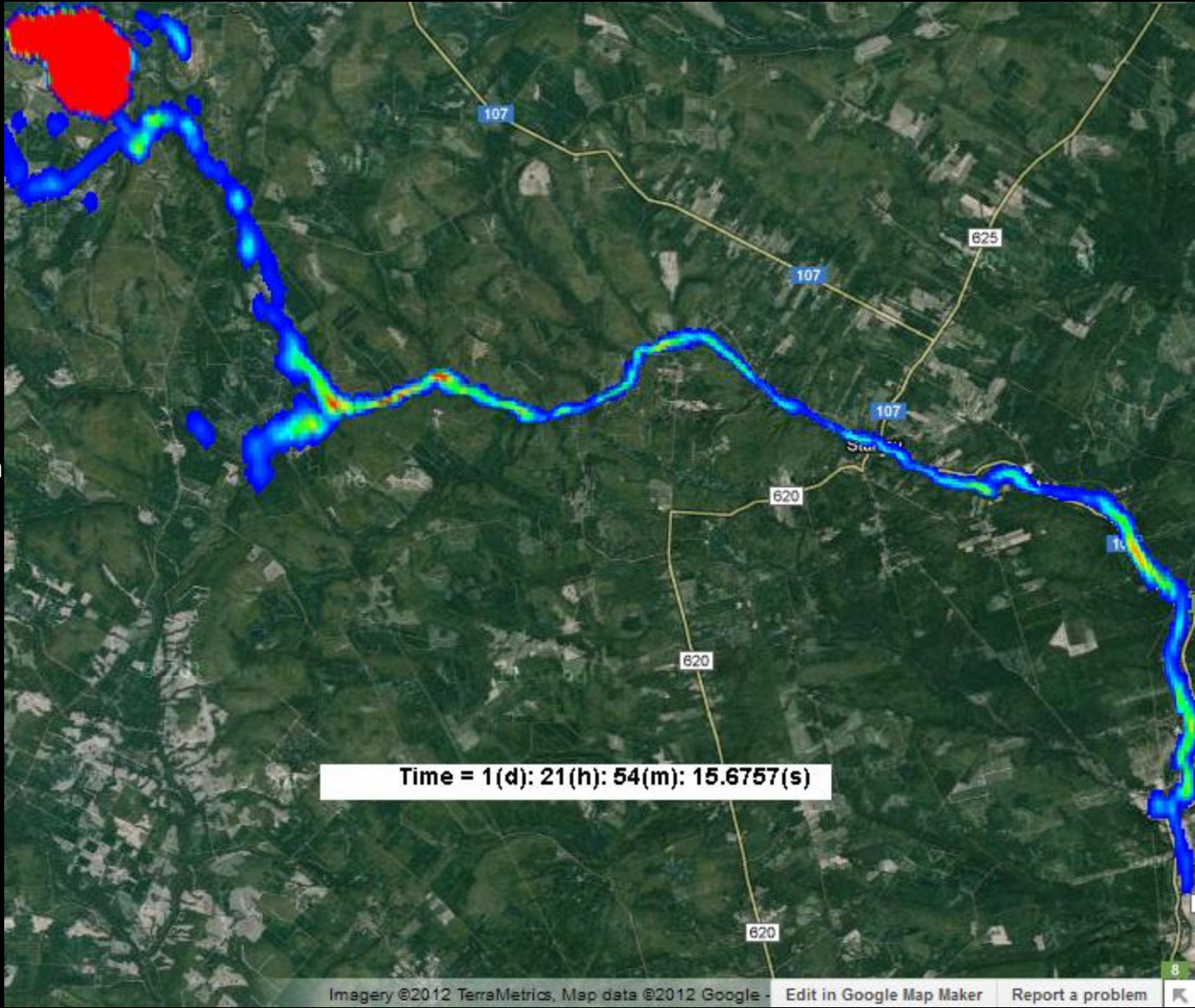
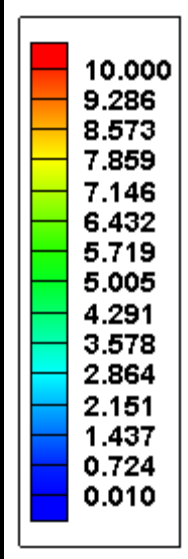


**LEGEND**  
Water Depth m



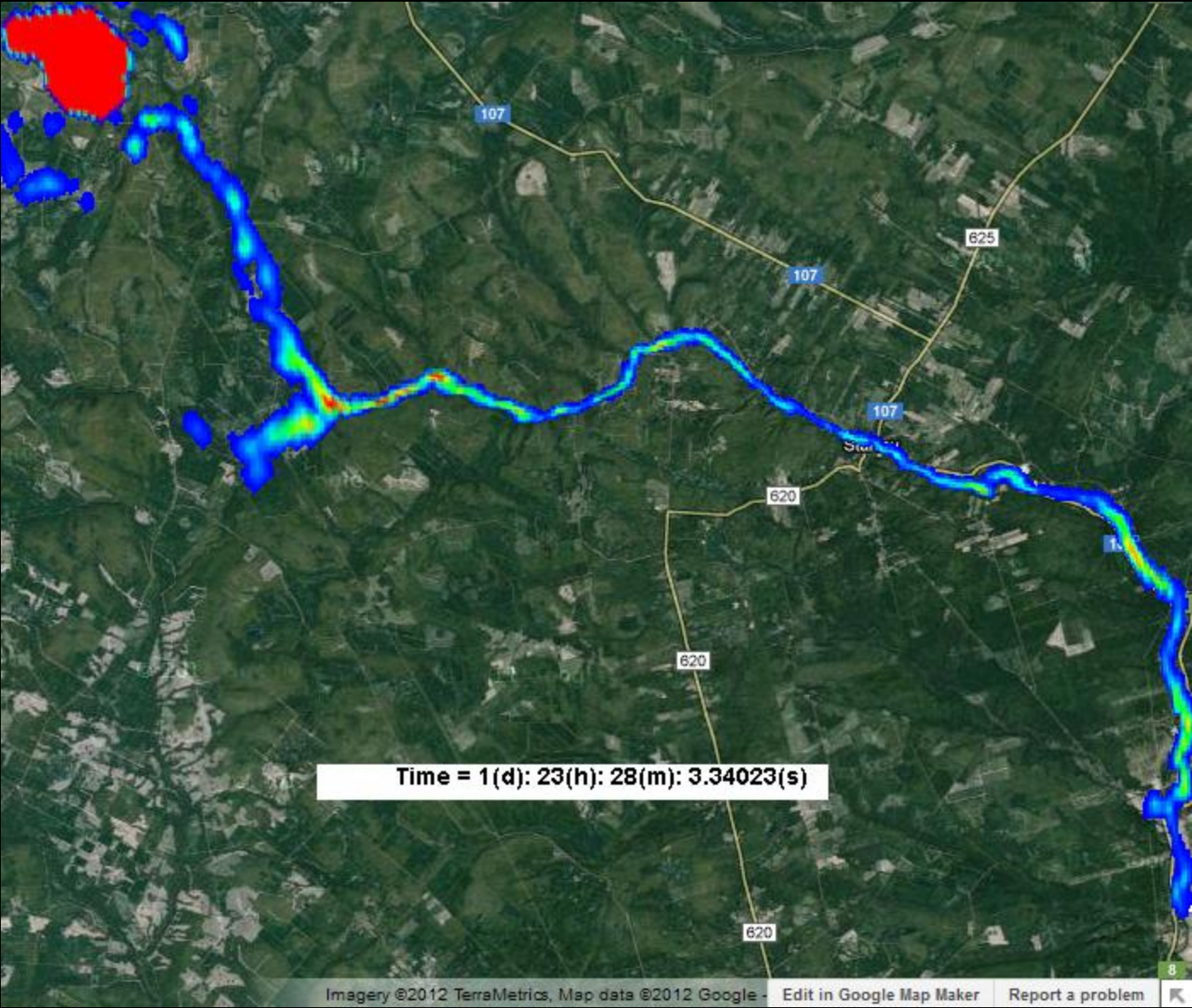
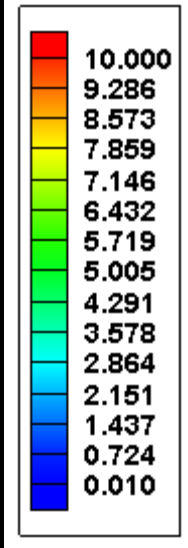


**LEGEND**  
Water Depth m

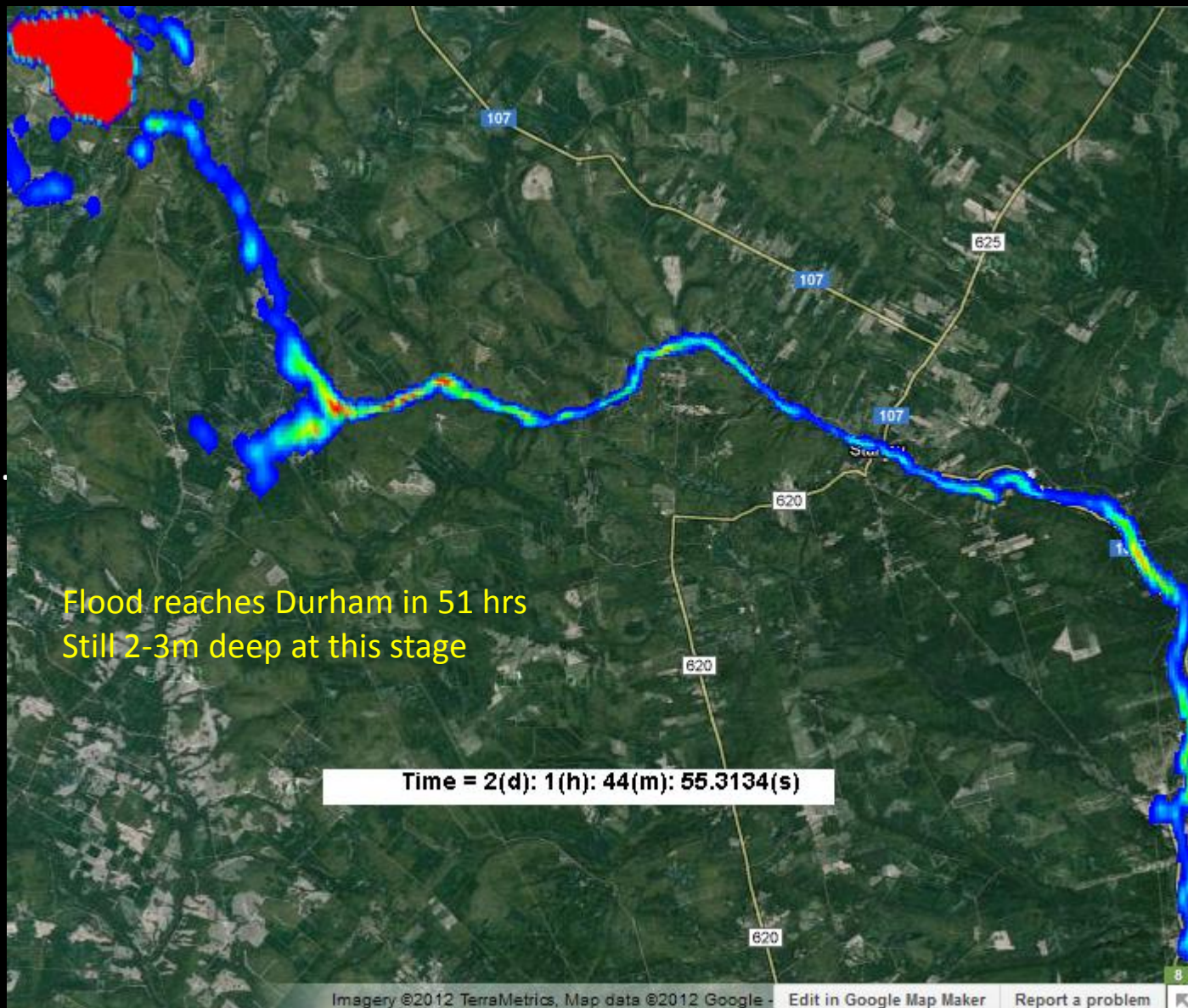




**LEGEND**  
Water Depth m

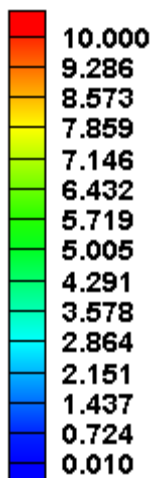






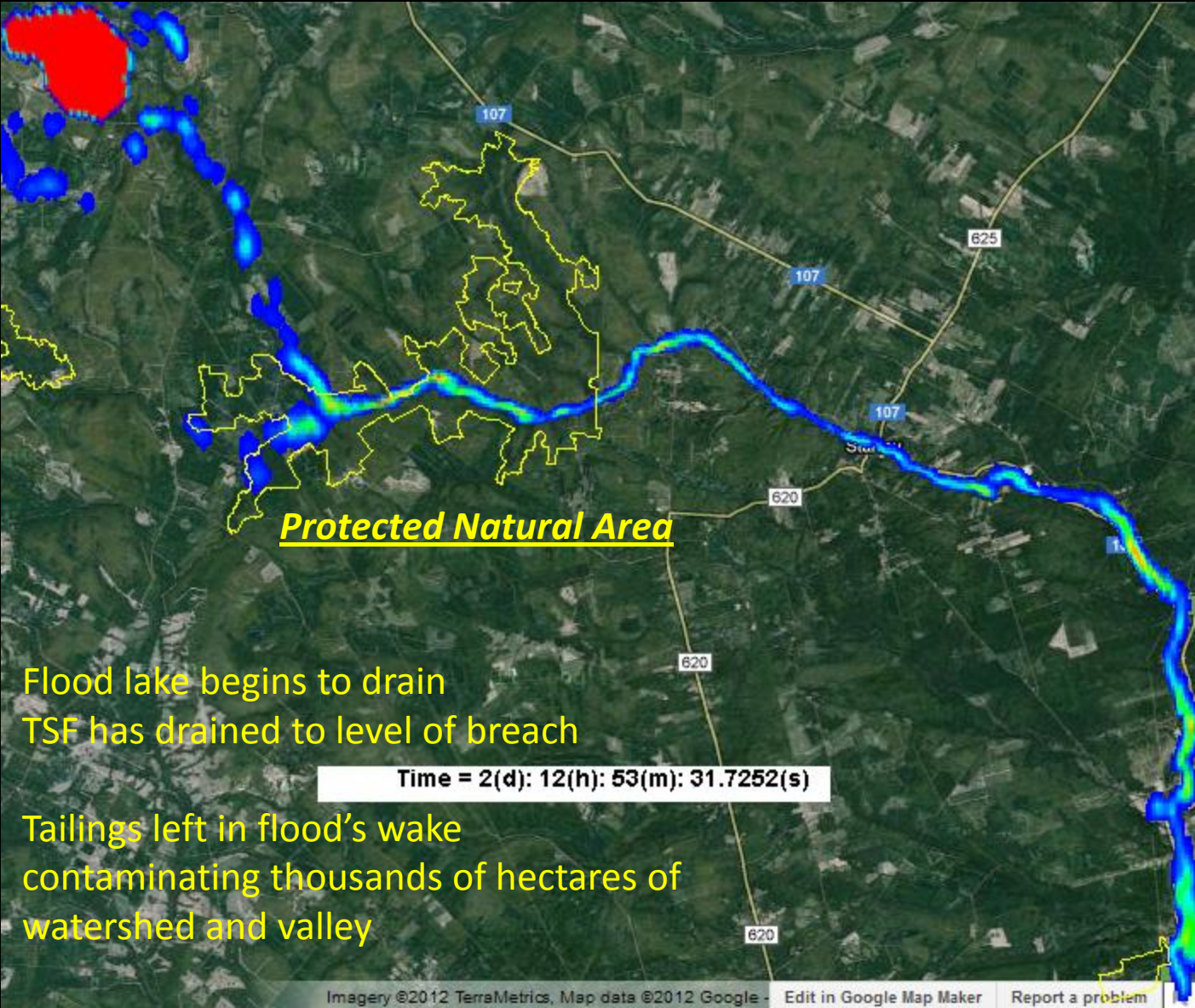
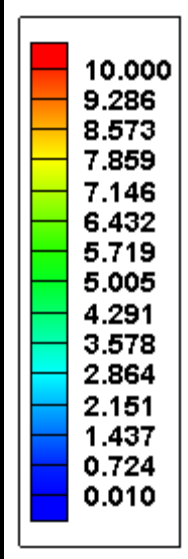
# LEGEND

Water Depth m.





**LEGEND**  
Water Depth m





## **In DENIAL**

The province maintains that it can regulate mining. However, for 13 years, successive governments of both stripes have flagrantly disregarded the **Classification Regulation** of the **Clean Water Act**.

The ombudsman has exposed the ridiculous façade that the government calls “**Water Classification**”. We shell out over \$20 million a year to a Department of Environment whose purpose is to create the illusion of environmental oversight.

If the Nashwaak had been **properly classified**, there could be no mine until the residents of the Nashwaak Watershed accepted **re-classification** based on the proponent’s business case for accepting the environmental and health risk

***We can begin to believe in Regulation when the government obeys its own laws and regulations.***

**This is why we are where we are as a province.**

**The province follows the Clean Water and Clean Air Acts UNTIL the acts interfere with their industrial agenda. Examples:**

- 1. Acceptance of erroneous rainfall data at Penobsquis, resulting in a 7 year delay in citizens of Penobsquis gaining justice and compensation for lost water**
- 2. Temporary adjustment of the geo-location of a fault line intersecting the proposed Picadilly Potash Mine at Penobsquis while the mine was undergoing EIA**
- 3. Re-definition of wetlands to relieve the necessity for an EIA of a proposed peat operation at Juniper**
- 4. Acceptance of inadequate water treatment at Sisson while simultaneously imposing more stringent conditions on a mine of similar contamination at Mount Pleasant**



# The Future

- *We already have the capacity to do directed drilling, e.g. shale gas*
- *We already have some capacity to do borehole mining targeting high concentrations of minerals<sup>1</sup>*
- *We already have robotics capable of extracting high grade ore in directed boreholes without archaic open pit mining.*

**Leave all this low-grade ore in the ground until these innovative technologies permit extraction in a sensible, environmentally and economically sound way.**

<sup>1</sup> <http://www.boreholemining.com/home/bhm-videos/main-page/bhm-publications>

# **In Summation**

- **Outside of any environmental, ecological or health considerations, this mine is not the way to move this province forward economically.**
- **This mine is asking the taxpayers of NB to subsidize corporate investment games, and corporate profits that will exit the province and leave NB to deal with an environmental mess.**
- **The province is laying waste to a pristine resource in desperation for short-term political gain**
- **History will ask how we could be so foolish as to pollute our most valuable resource, clean water, for 27 years of unprofitable, archaic open-pit mining**