

Modelling as a tool for Coastal Flood Risk Assessment

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UNIVERSITY OF
LIVERPOOL

Adaptation and Resilience of Coastal Energy Supply

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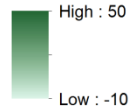
Adaptation and Resilience of Coastal Energy Supply

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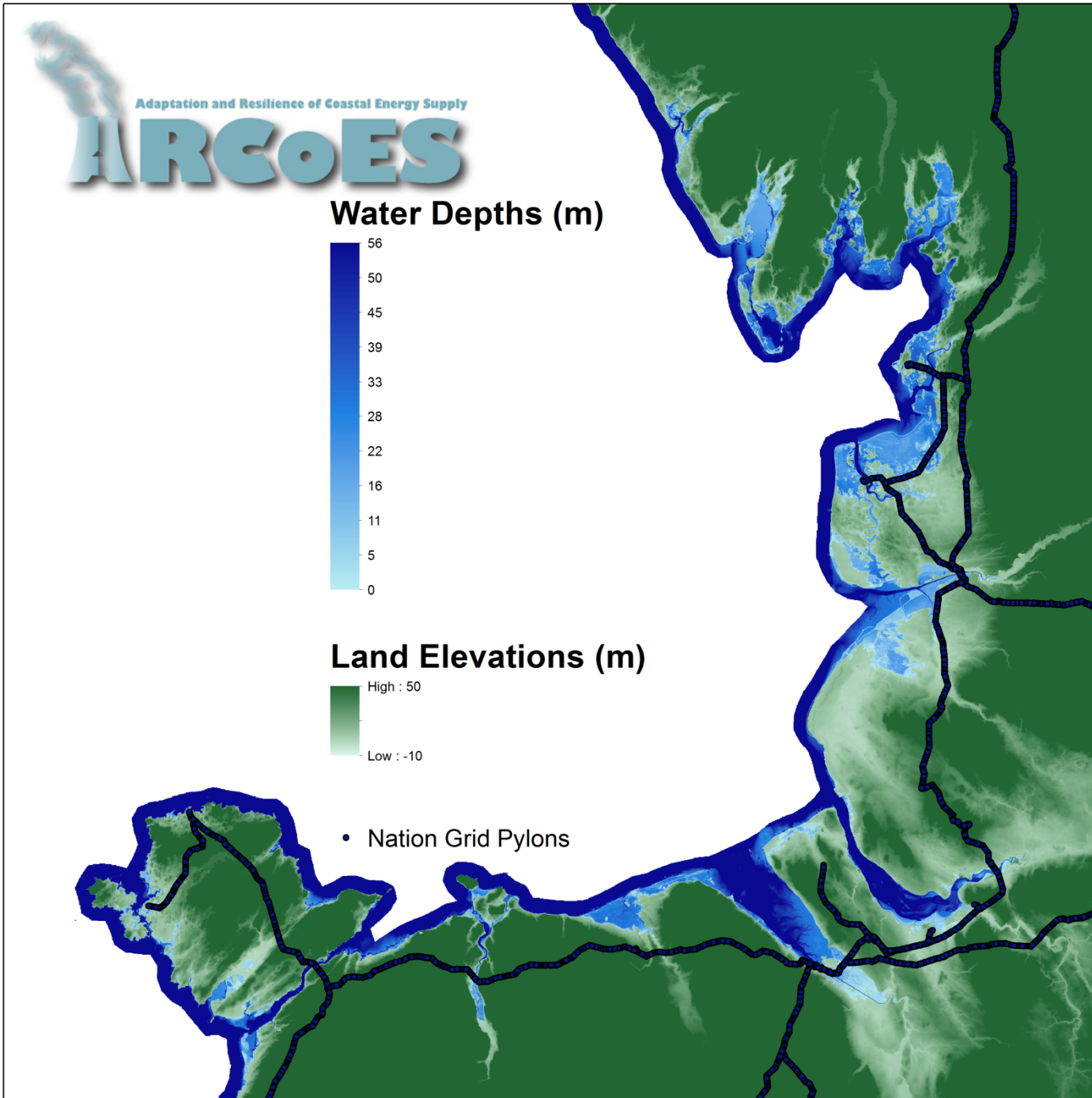
Water Depths (m)



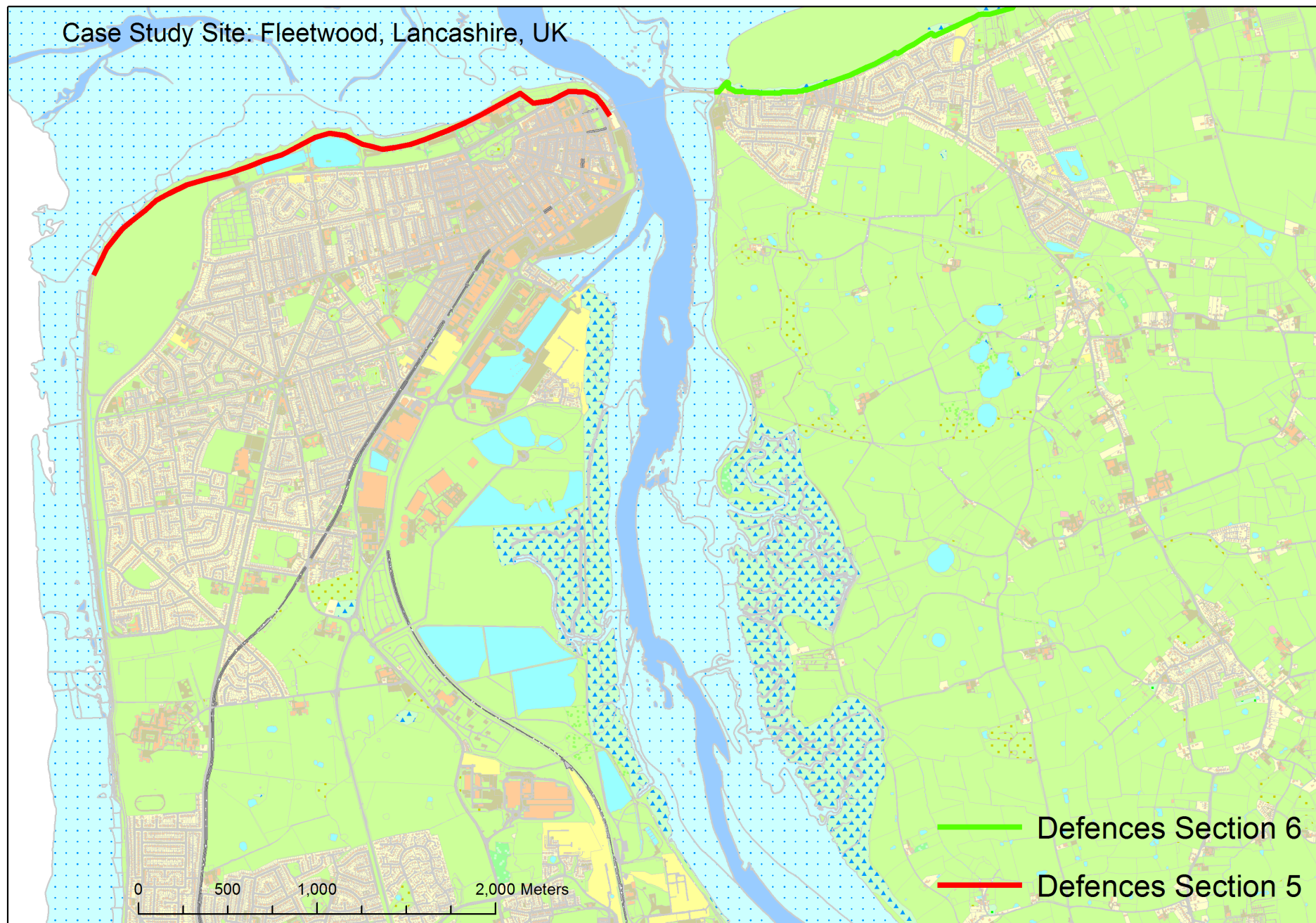
Land Elevations (m)



• Nation Grid Pylons

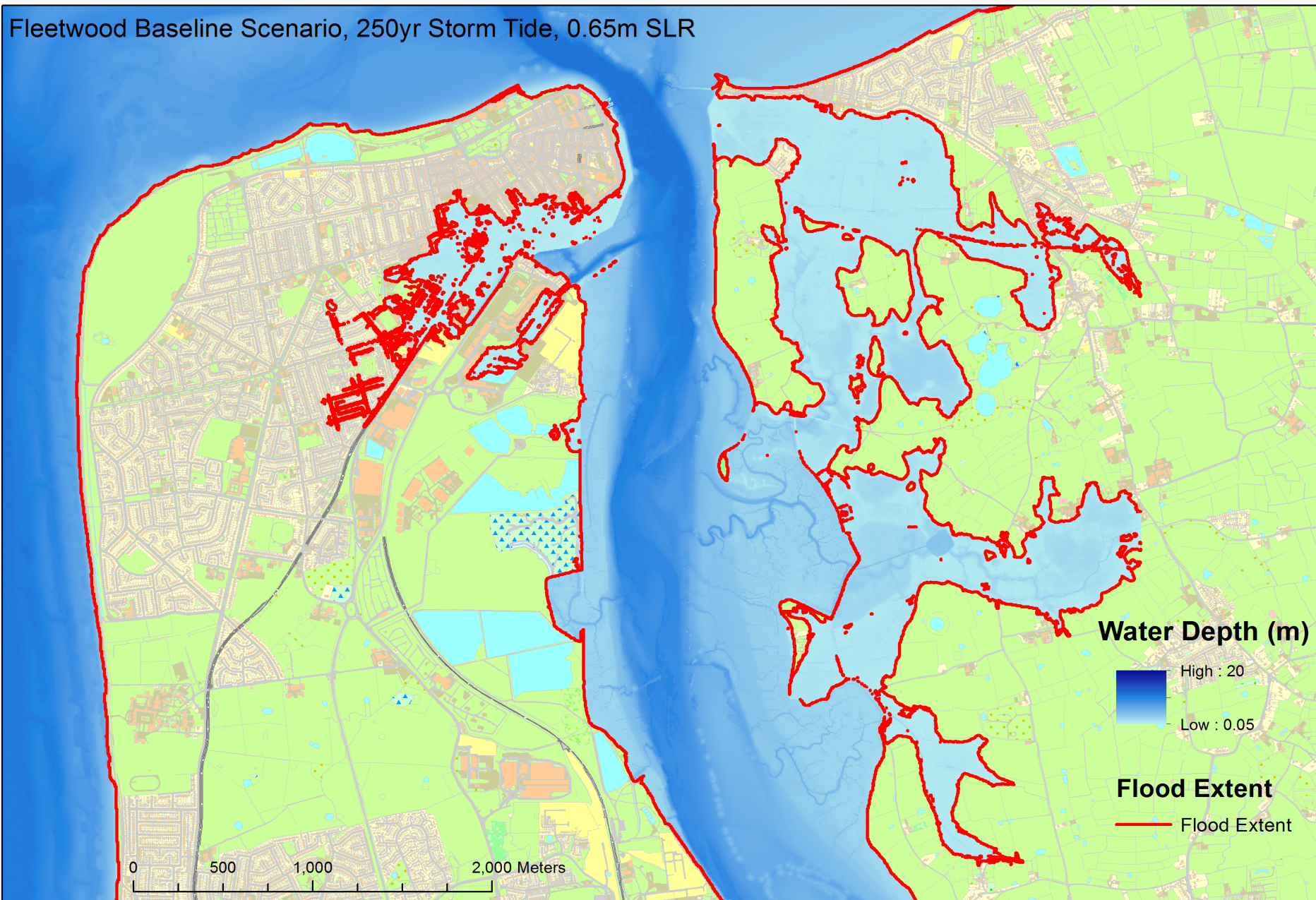


Case Study Site: Fleetwood, Lancashire, UK



Case Study Site: Fleetwood in Lancashire

Fleetwood Baseline Scenario, 250yr Storm Tide, 0.65m SLR

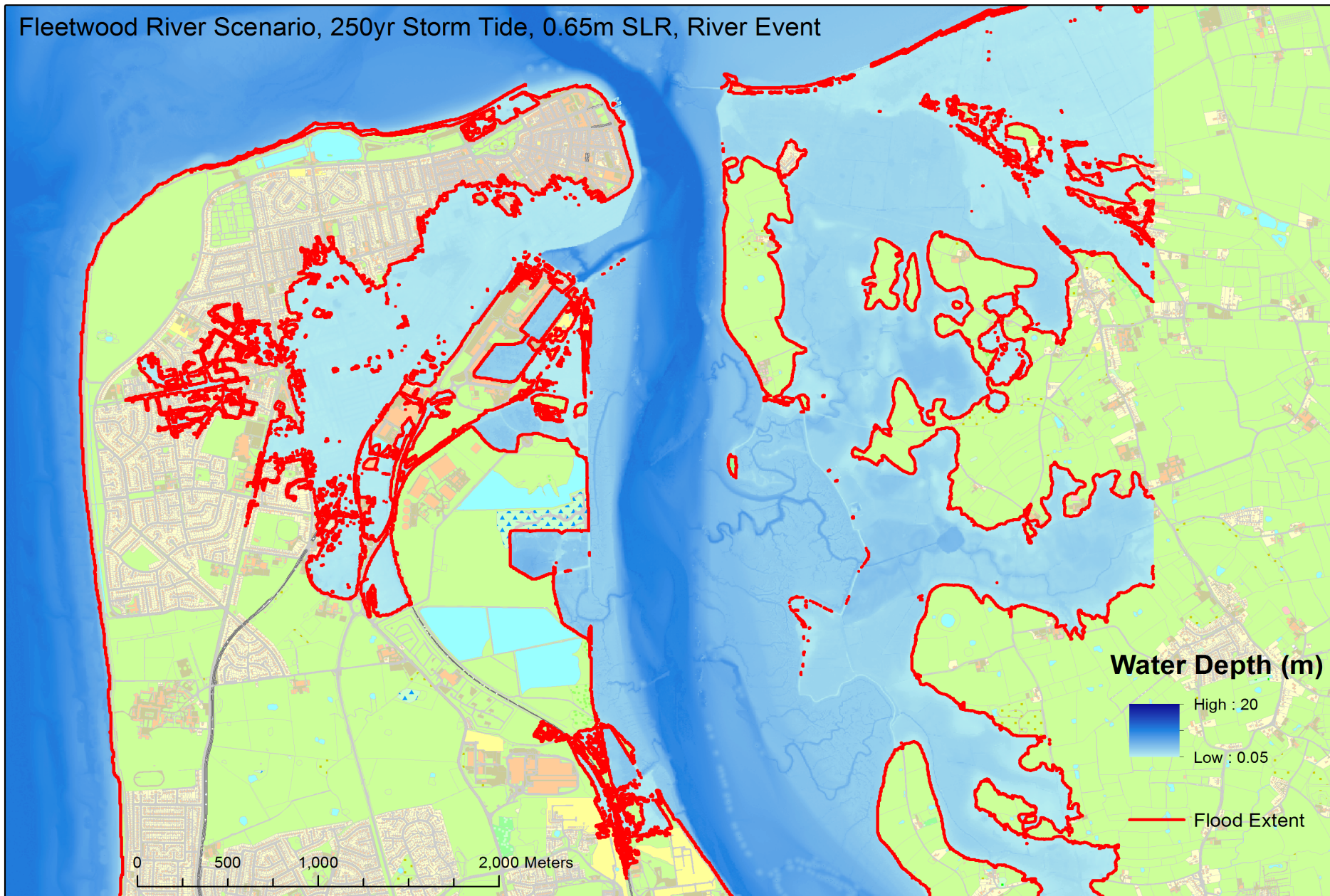


Topography [GML2 geospatial data], Scale 1:1250, Tiles: GB, Updated: March 2013, Ordnance Survey (GB), Using: EDINA Digimap Ordnance Survey Service, <<http://digimap.edina.ac.uk>>, Downloaded: Tue Nov 19 08:20:31 GMT 2013

✗ River forcing ✗ Wave overtopping

• 4.26Mm² of inundation
• 4.6Mm³ of Flood Water

Fleetwood River Scenario, 250yr Storm Tide, 0.65m SLR, River Event



Topography [GML2 geospatial data], Scale 1:1250, Tiles: GB, Updated: March 2013, Ordnance Survey (GB), Using: EDINA Digimap Ordnance Survey Service, <<http://digimap.edina.ac.uk>>, Downloaded: Tue Nov 19 08:20:31 GMT 2013



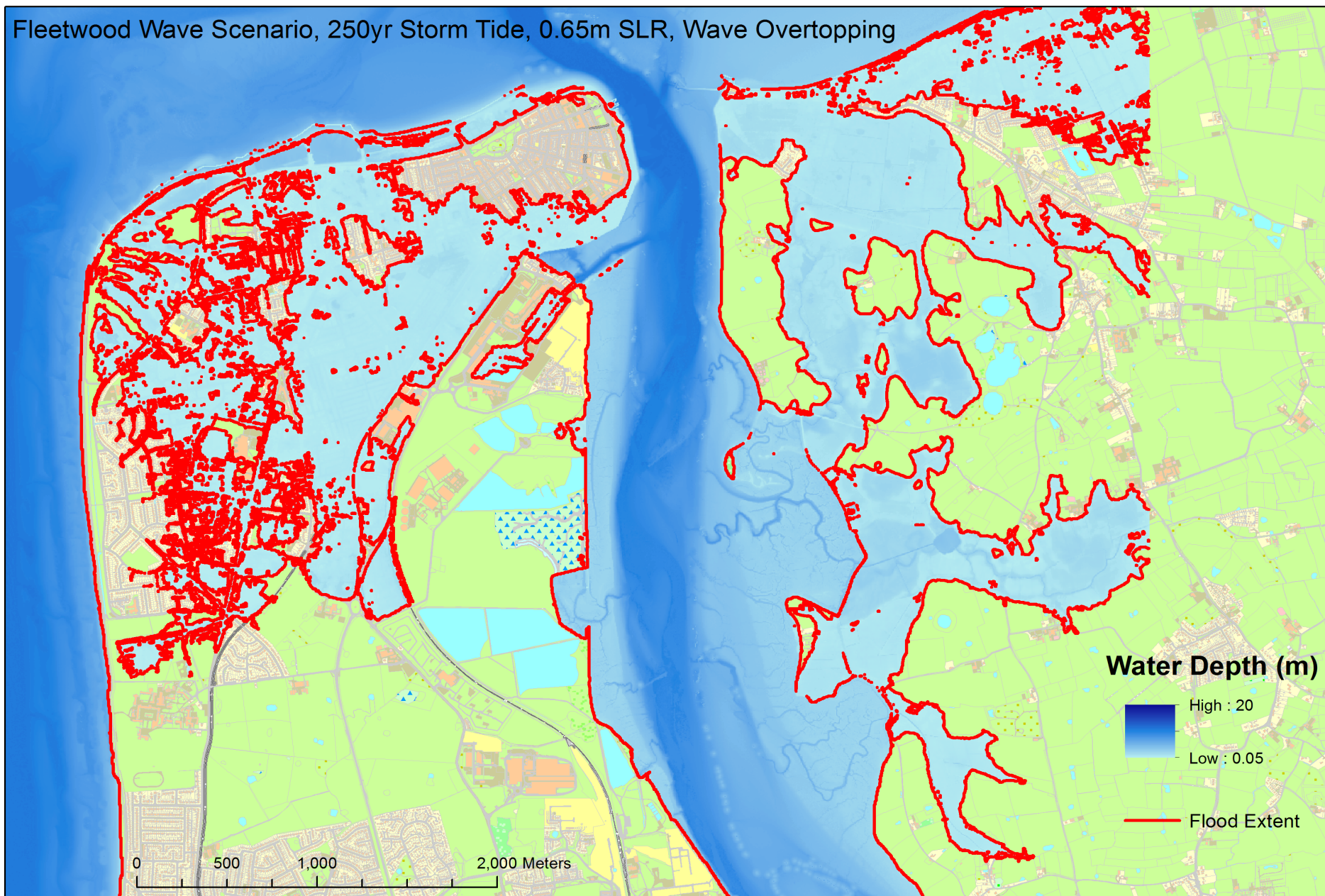
River forcing



Wave overtopping

- 9.68Mm² of Inundation
- 12.2Mm³ of Flood Water

Fleetwood Wave Scenario, 250yr Storm Tide, 0.65m SLR, Wave Overtopping



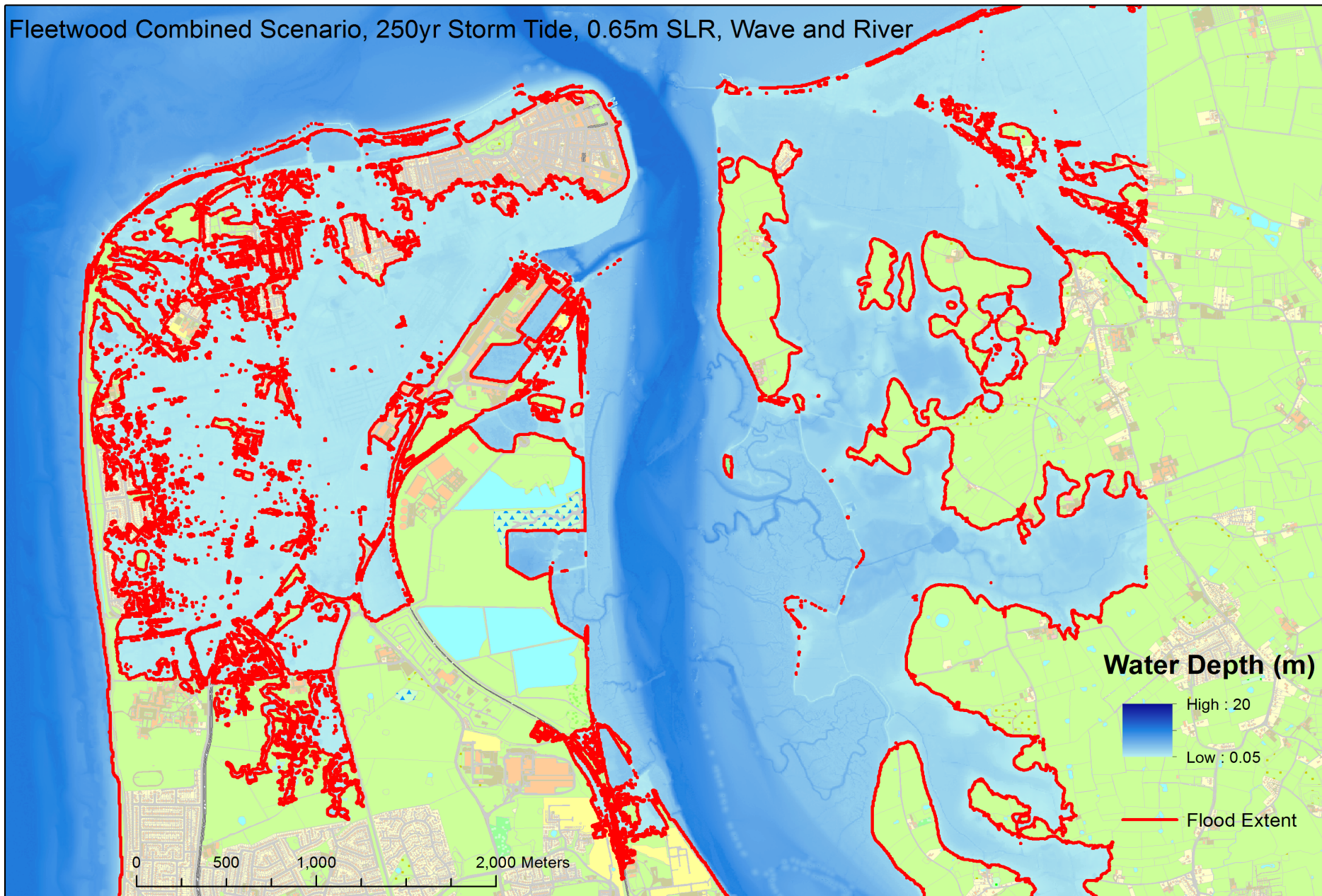
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✗ River forcing

✓ Wave overtopping

•8.33Mm2 of Inundation
•7.0Mm3 of Flood Water

Fleetwood Combined Scenario, 250yr Storm Tide, 0.65m SLR, Wave and River



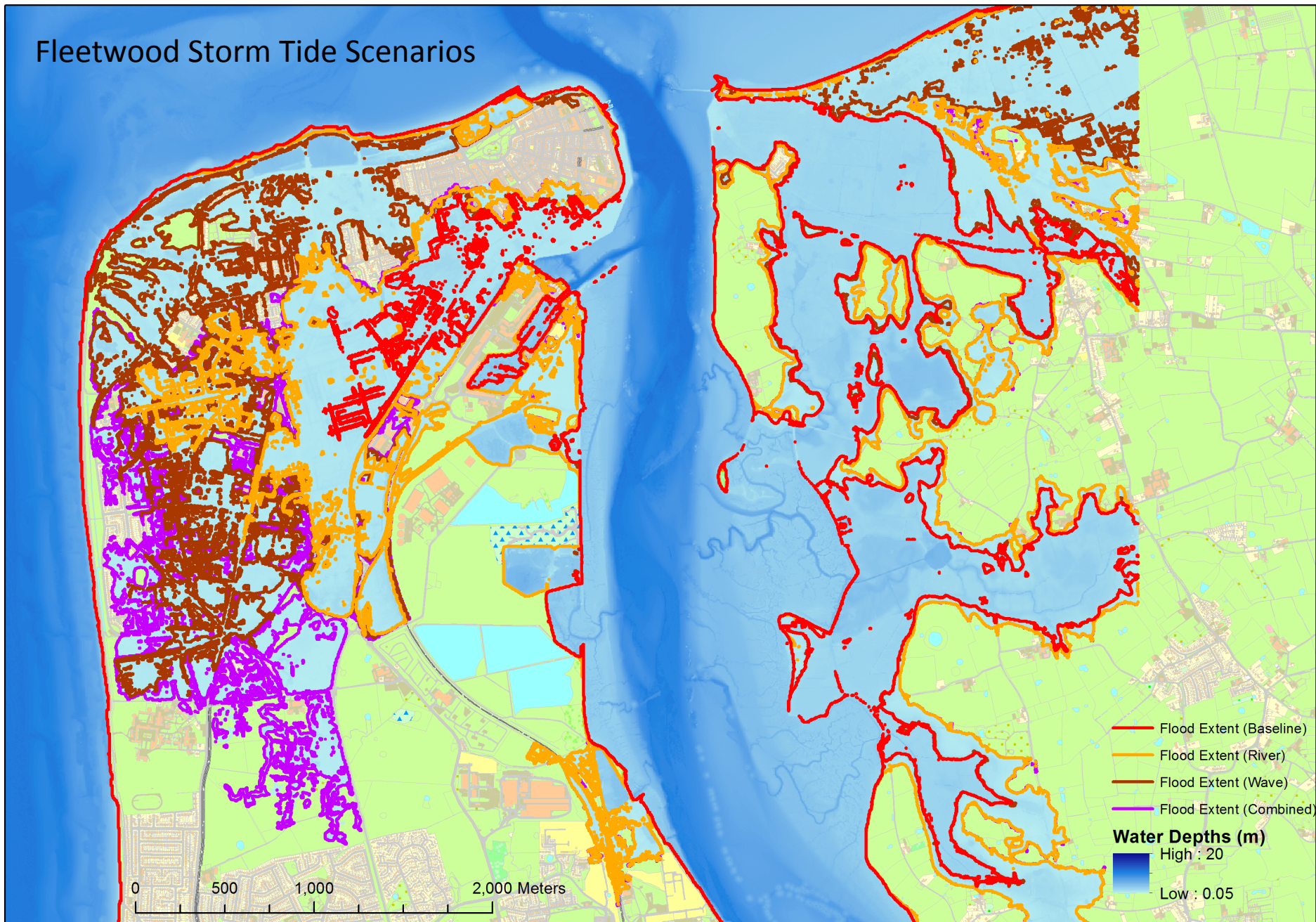
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✓ River forcing

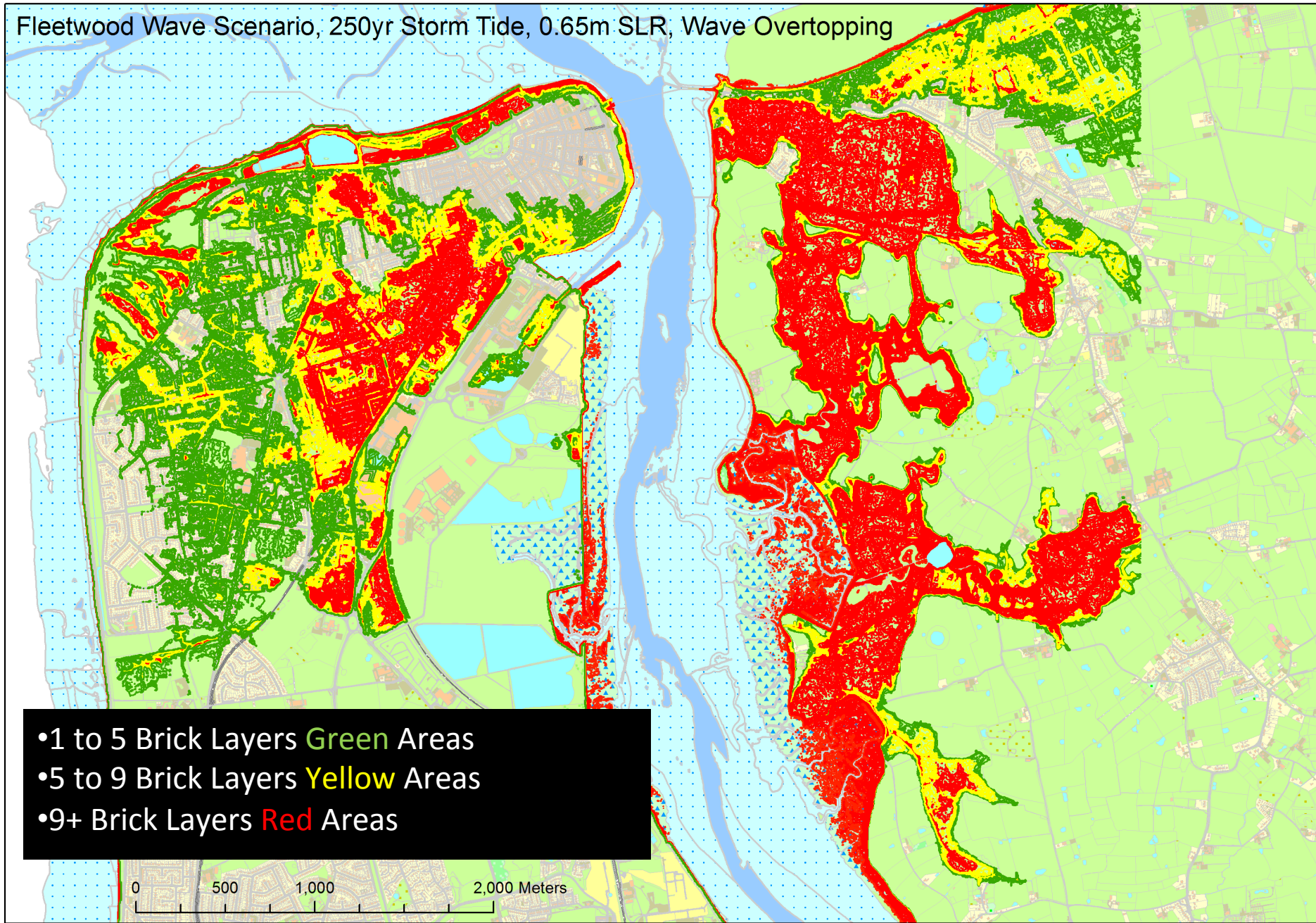
✓ Wave overtopping

- 12.75Mm2 of Inundation
- 14.0Mm3 of Flood Water

Fleetwood Storm Tide Scenarios

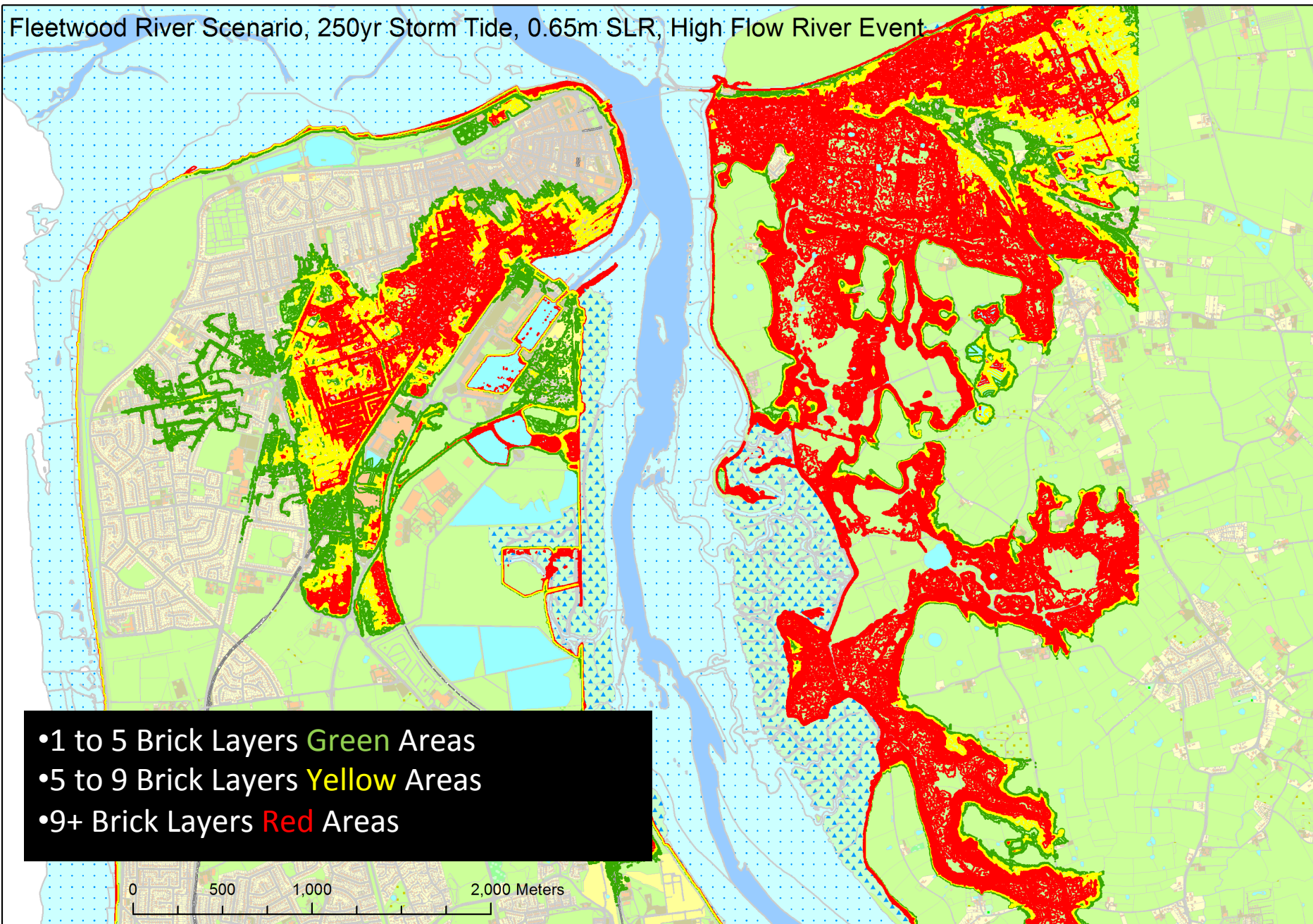


Fleetwood Wave Scenario, 250yr Storm Tide, 0.65m SLR, Wave Overtopping



Red Area Flood Resilience measures ineffective, **Green/Yellow** areas Flood resilience effective

Fleetwood River Scenario, 250yr Storm Tide, 0.65m SLR, High Flow River Event



Red Area Flood Resilience measures ineffective, **Green/Yellow** areas Flood resilience effective

Cost of Projected Inundation Events

Scenario	Arable Land Cost (£M)	Housing Cost (£M)	Road Cost (£M)	Industrial Cost (£M)	Total Costs (£M)
Baseline	0.2	47.7	0.2	0.8	48.9
River Only	0.3	241.2	0.8	5.0	247.3
Wave Only	0.2	218.5	0.6	5.3	224.6
River & Waves	0.3	367.3	1.1	8.4	377.1