



Tan Lan Embankment Project

Briefing note

Project background

The 3.2km long Tan Lan Embankment, situated north of Llanrwst in the Conwy Valley, has a recurring history of being damaged. The River Conwy's normal tidal limit is located at Tan Lan Junction. Consequently, the area is at risk of flooding from the river and the tide.

As the climate changes and we will face more frequent storms and heavy rainfall, as well as rising sea levels, flooding events will become more frequent. The river is predicted to have a high chance of overtopping the embankment each year, posing a risk to several homes.

We are looking to identify options to sustainably manage flood risk to the local communities, properties, land, services and infrastructure at Tan Lan, and in doing so, gather evidence to inform the future approach for the Tan Lan Embankment.

Baseline Fluvial Model

Hydraulic models help us understand the impact of river and tidal flooding in communities.

These models are generally split into three areas:

- 1. Source of flood water** includes river (fluvial) flows and rainfall. We use Annual Exceedance Probability (AEP) to consider different storm and flood events with a statistical probability of occurrence. For example, a 1% AEP flood is described as a flood with a 1% chance of occurring each year.
- 2. Pathways** include river channels, floodplains, hydraulic structures, flood defences and downstream boundaries such as tidal levels.
- 3. Receptors** are residential or commercial properties, infrastructure or land at risk of flooding.

By using this source/pathway/receptor approach we can assess and compare the flood risk to communities across the whole valley for different storm events and climate change scenarios, and compare outputs from different options.

Stages of Preparing the Model

The different stages involved in preparing the model are explained below:

1

Data gathering exercise

Included requesting and reviewing data such as utilities, geology, maps and photographs from previous flood events.

2

Hydrology update

Looked at the whole catchment area for the Afon Conwy, rainfall records and photographs (in particular from the winter 2015 flooding event) to help us predict storm events and the flood risk, both now and in the future with climate change.

3

Update to the geometry of the fluvial model

Using latest topographic data. This included site surveys carried out in June 2022 on the Tan Lan Embankment and nearby properties and LiDAR (airborne survey which measures ground levels in large areas).

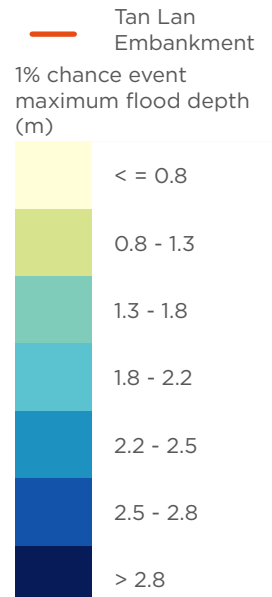
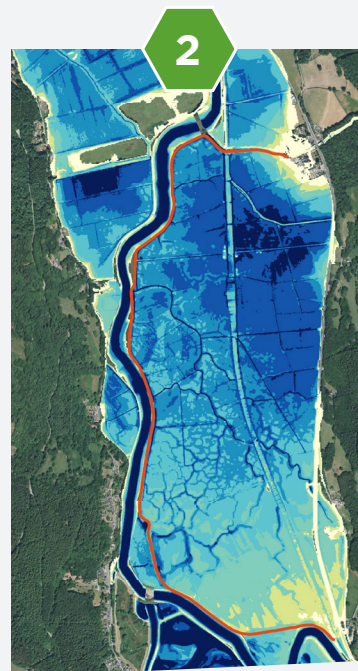
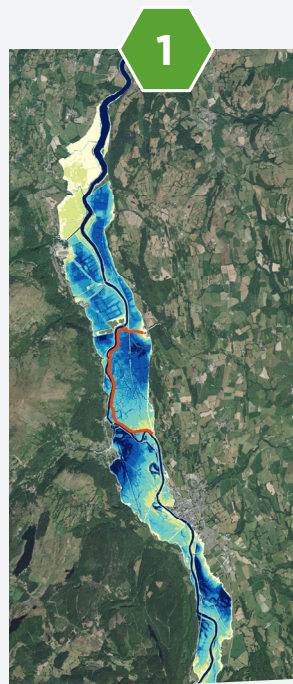
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Model calibration

Using data (such as river levels, flood levels and rainfall data) collected from Storm Ciara in February 2020. This included modelling a breach in the embankment, as happened in that event. We calibrated the model to check that the outputs align closely with actual events.

Baseline Fluvial Model

The update of the baseline fluvial model has now been completed. The outline of the flood event that has a 1% chance of occurring in any given year is shown in **Figure 1**, and a zoomed in version of the Tan Lan Embankment is shown in **Figure 2**.



Contact us

If you would like further information about the project, to arrange a meeting, or to receive regular updates, please get in touch with NRW's project team:

 tan.lan@grasshopper-comms.co.uk

 01492 701381