Implementing CENTAUR® - Phase 1 - The Opportunity Map

The first phase in the implementation of CENTAUR® to improve storm overflow performance is to gain an understanding of where installing a gate can provide mobilisable storage within the existing network. We do this by creating the **CENTAUR® Opportunity Map** – A quick easy reference to identify opportunities.

The Opportunity Map

What is the Opportunity Map?

The Opportunity Map is a Geospatial output created by the Cura Terrae **MO**bilisable **ST**orage **A**ssessment **R**outine (MOSTAR). It takes outputs from a hydraulic model of a catchment and rapidly assesses where there may be pockets of storage that can be proactively managed by a CENTAUR® system. It creates a geospatial output of polygons, highlighting the network assets that could be actively managed by a gate and, using rainfall/runoff simulations from that hydraulic model, how much storage could be mobilised at those storm overflows to **provide greatest benefit in reducing storm overflow spills**.

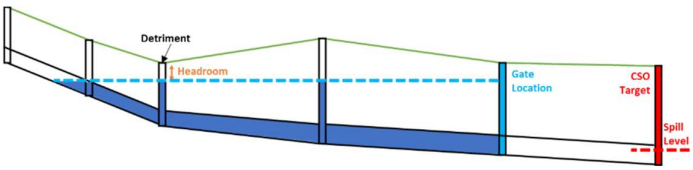
What do I need to create it?

Testing the benefits of installing a CENTAUR® system is carried out within InfoWorks ICM, the industry standard modelling software. The systems AI algorithms have been embedded within the software, so that **model behaviour = real world behaviour**. To align with this concept, MOSTAR also uses outputs from the same baseline hydraulic model to create meaningful outputs aligned to standard industry processes such as DWMP. The process to generate outputs has been optimised to a series of button clicks in ICM to export:

- Model Network CSVs– Using the separate CSV export output option within ICM
- DEPNOD CSV exports for rainfall simulations (ideally events which just cause spill at overflows)

What is MOSTAR Trying to find – The Process

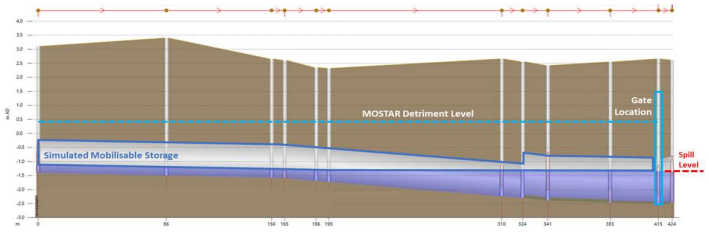
Our first objective is to **understand existing network hydraulic capacity**. Focusing on storm overflow locations, CENTAUR® gates are 'placed' upstream. An upstream detriment location is traced and headroom applied. This provides a limit for a system's operation.



Understanding existing Network Capacity

From this assessment a cluster of assets which could be mobilised are identified and a polygon generated. This process is then repeated, moving upstream and across the entire catchment network.

Once catchment asset clusters have been created, the rainfall/runoff simulation results are applied, mapping top water level across the network. This fills up the previously identified network capacity. What storage is remaining within that asset cluster up to the identified detriment level is **available to be mobilised by the CENTAUR® gate**. This figure is then applied to the MOSTAR polygons across the catchment, identifying storage volumes and potential gate locations across the catchment. This allows the mobilisable storage volume to be visualised.



Remaining storage calculated after rainfall/runoff

Interpreting the Opportunity Map – Integrating Storm Overflow Performance

Once all simulations have been processed, a catchment wide opportunity map is produced for each of the rainfall/runoff simulations assessed. This creates a thematically mapped set of mobilisable storage clusters.

Linking Opportunity to potential Benefit

Interpreting these at catchment level does then require understanding of the potential benefit that identified storage volumes have for the storm overflows they are potentially protecting. Aligning 125m³ of mobilisable storage behind a gate to spill frequency and volume is a critical step in the process.

The Opportunity Map, linked to storm overflow performance, enables a **rapid catchment wide assessment of the opportunity to reduce storm overflow spills**.

It also identifies where multiple storage clusters could be managed behind a series of gates to have a cumulative impact on storm overflow spills.

This will ultimately provide a **prioritised list of storm overflows** within the catchment where CENTAUR could have the provide the greatest benefit in reducing storm overflow operation, both in terms of spill frequency and spill volume. This can then enabled targeted locations transitioning into Phase 2.

Moving on from MOSTAR – Phase 2- Modelling in ICM

From the catchment wide assessment the prioritised list of storm overflows can be carried into Phase 2 – Modelling in InfoWorks ICM. As mentioned earlier, CENTAUR is embedded within ICM as a standard feature, so simulating the actual behaviour of a gate is very straightforward and can take as little as 20 minutes to get started. This can be undertaken by anyone familiar with ICM and there is extensive guidance available from Cura Terrae to support your activities.

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