

Background

Floods are a major threat to human life and property on a global basis, Norway being no exception. However, Norway is in possession of approximately half of Europe's reservoir capacity, which provides a significant potential for flood dampening. This potential depends on factors and circumstances such as regulation capacity, initial reservoir filling, spillway capacity, rainfall location, etc.

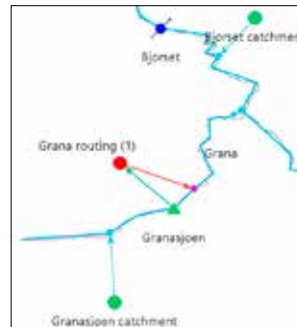
Objective

Initially, a literature study will be carried out to establish the current situation for reservoir flood dampening research, implementation, and performance on a global and national scale, and then specific regulated catchments in Norway will be modelled. A single-reservoir system will be modelled in Excel, while the multi-reservoir Orkla catchment will be modelled in WEAP, both models with the purpose of investigating the flood dampening caused by the reservoirs, as well as the impact of initial filling (either due to seasonal variations in filling or draw-down prior to a flood event).

Using the results found in the literature study and obtained from the modelling, the possibility of creating a flood-dampening factor based on regulation capacity and other catchment characteristics will be looked into and evaluated for both single- and multi-reservoir systems.



Orkla catchment



River Grana in WEAP

Bendik Kristoffer
Torp Hansen



Department of Civil
and Environmental
Engineering

Spring 2018

**Flood-dampening in
hydropower systems**

Supervisor:
Tor Haakon Bakken

Co-supervisor:
Knut Alfredsen

In cooperation with:
SINTEF

 **NTNU**