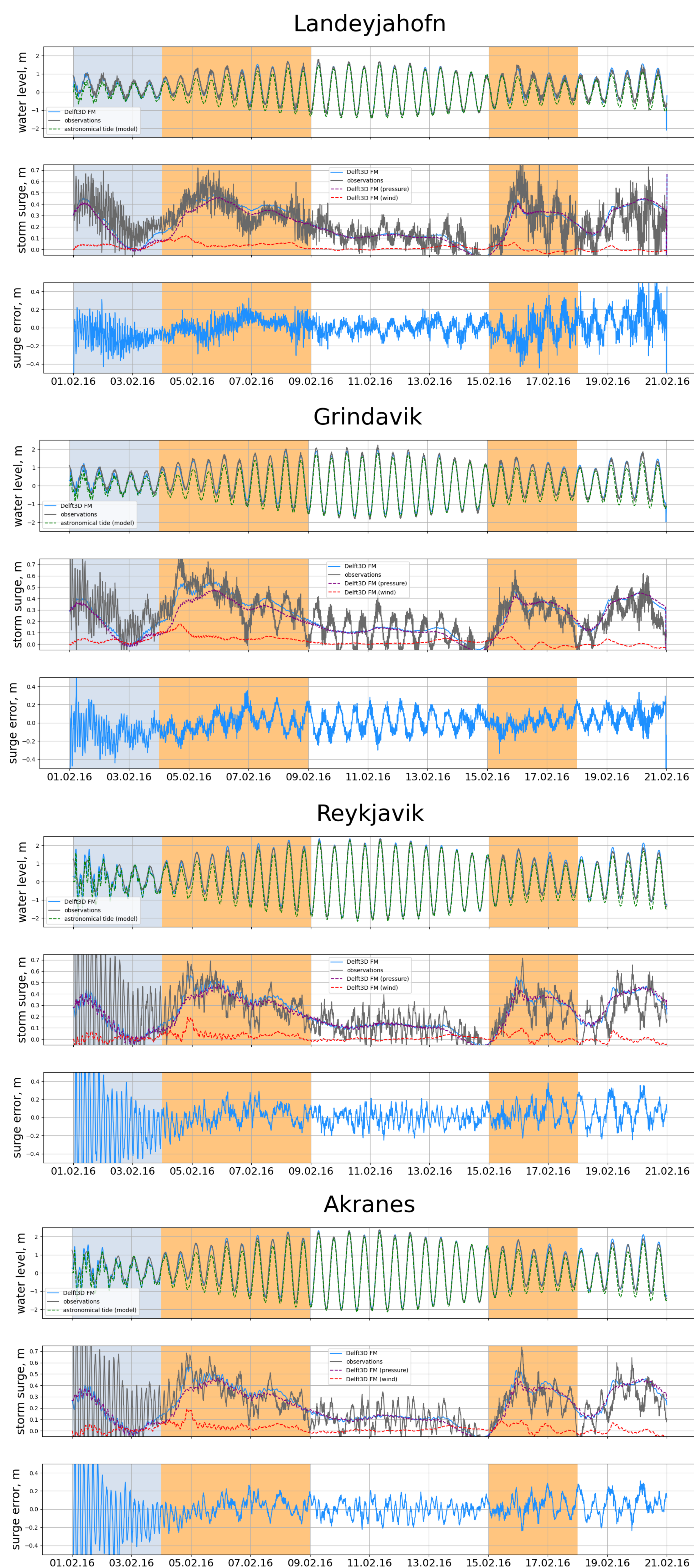# Samanburður á mælingum á sjávarborði og líkanreikningum með Delft3D-FM og greining áhrifaþátta strandflóða
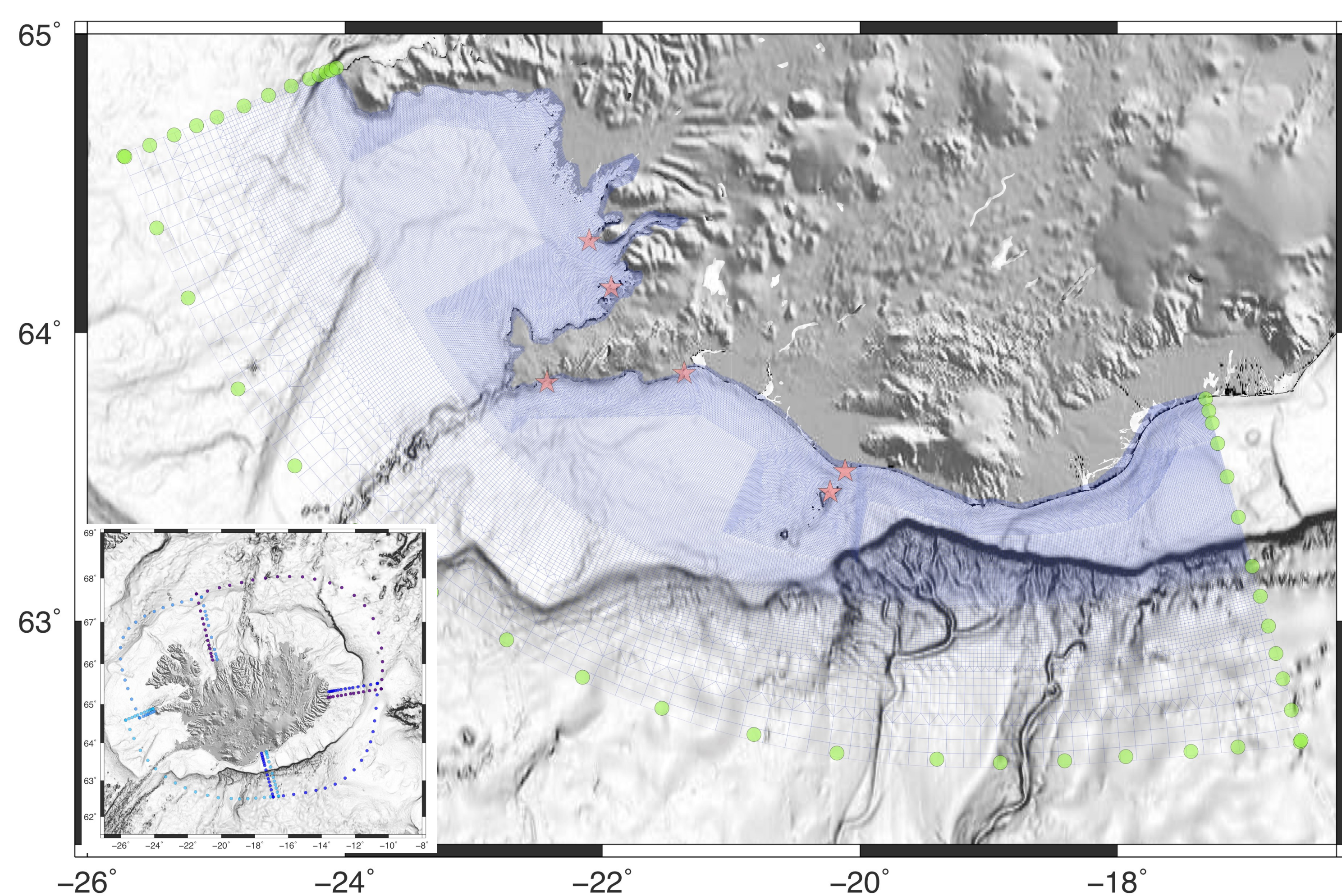
Kévin Dubois*, Angel Ruiz-Angulo, Halldór Björnsson, Sigurður Sigurðarsson and G. Orri Gröndal

Introduction: Coastal floods cause damage and disruption to the activities in harbours and coastal communities. Iceland has undergone about 84 floods in the second half of the XX Century (G. E. Jóhansdóttir, 2017), with a recurrency of about 6 significant floods every decade (P. Imsland and Þ.Einarsson, 1991). Thus, both monitoring and forecasting these events is relevant to the coastal communities. The aim of this project is to improve knowledge of coastal floods. We set up 4 domains for Iceland and the South West domain is our pilot domain, shown in Figure 1.

Method: We selected two consecutive historical storms in February 2016, recorded at tide gauges in Akranes, Reykjavík, Grindavík, Landeyjahöfn, Þorlákshöfn and Báskasker (Vestmannaeyjar). We used the coastal model Delft3D-FM to simulate the flooding events. The numerical model is forced with hourly surface wind and pressure (IRCA reanalysis) throughout the domain and tidal constituents (FES2017) at the boundaries. The results are compared with the measurements from Vegagerðin's database. Four sets of simulations were carried out to separate the contribution of each component: tide-only (dashed green), tide and wind-only (dashed red), tide and pressure-only (dashed purple), and the full forced simulation (light blue).

Figure 1. Map of the South West domain of Iceland including the unstructured mesh showing higher resolution at the coast. The stars represent the stations where the comparison for the storm in February 2016 was performed.

Figure 2-7. Storm surge observations and numerical model estimates for February 2016. The upper panel shows the water level from observations (gray), the tidal model (dashed green) and the Delft3D FM solution (blue). The middle panel shows the storm surge from the observations and the model full forced with surface winds and pressure as well as the contribution from each component (U and P). The lower panel shows the residual between the observations and the model. The period of time in gray corresponds to the spin up process that carries out a large error for all stations.

G. E. Jóhansdóttir (2017). Methods for Coastal Flooding Risk Assessments: An Application in Iceland; P. Imsland and Þ.Einarsson (1991). Sjavarfloð a Eyrarbakka og Stokkseyri.