

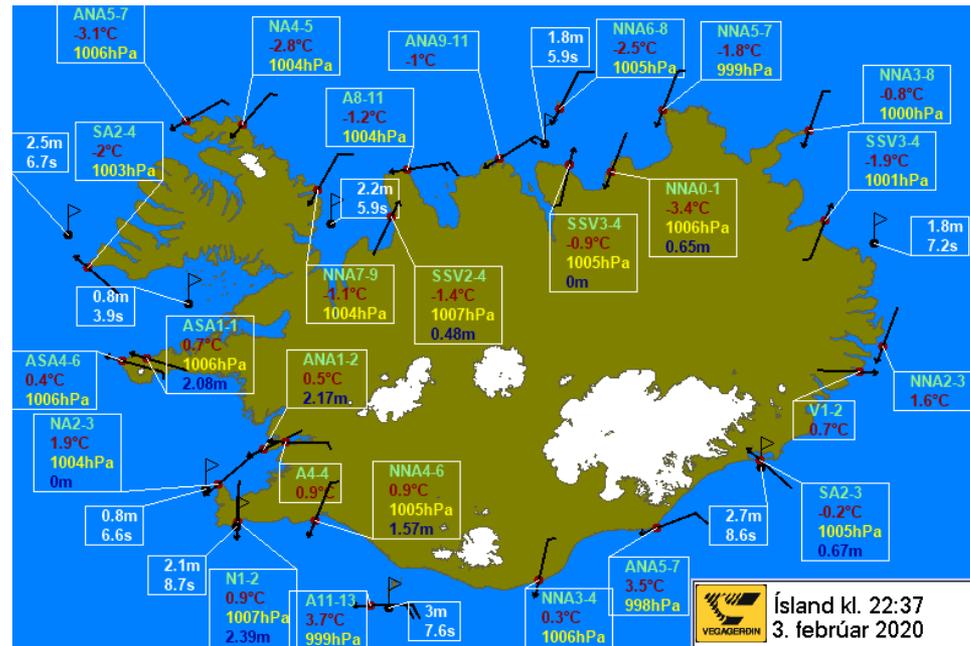


National tidal observation network

Gunnar Orri Gröndal

Tidal observation network

- Experiences
- Further developments



Veður og sjólag

- Weather and sea state (Veður og sjólag) – Information system for users at sea
- Established in the 1990'ies
- Aim:
 - Improve safety at sea
 - Aid navigation
 - Aid planning of work at sea and coast
 - Publish observations and predictions

Veður og sjólag

- Includes information from a nation wide network of tidal gauges
- Electronic tide gauges
 - 1994-2000 (12): Hafnarfjörður, Grundartangi, Patreksfjörður, Dalvík, Hvanney, Vestmannaeyjar, Þorlákshöfn, Grindavík, Ólafsvík, Húsavík, Njarðvík, Sandgerði
 - 2000- present (5): Akranes, Skagaströnd, Reyðarfjörður, Höfn, Landeyjahöfn, ...

Veður og sjólag

- Data from 13 harbours displayed on Veður og sjólag
- Tide prediction for 25 harbours
- Local harbour is owner and responsible for operating gauge
 - Support from IRCA

Veður og sjólag

- Designed to inform about present and near future situation
- Collection of historical data in a database
 - „... On the web it is possible to look up past information by inserting date and time, decades back.“

Historical data

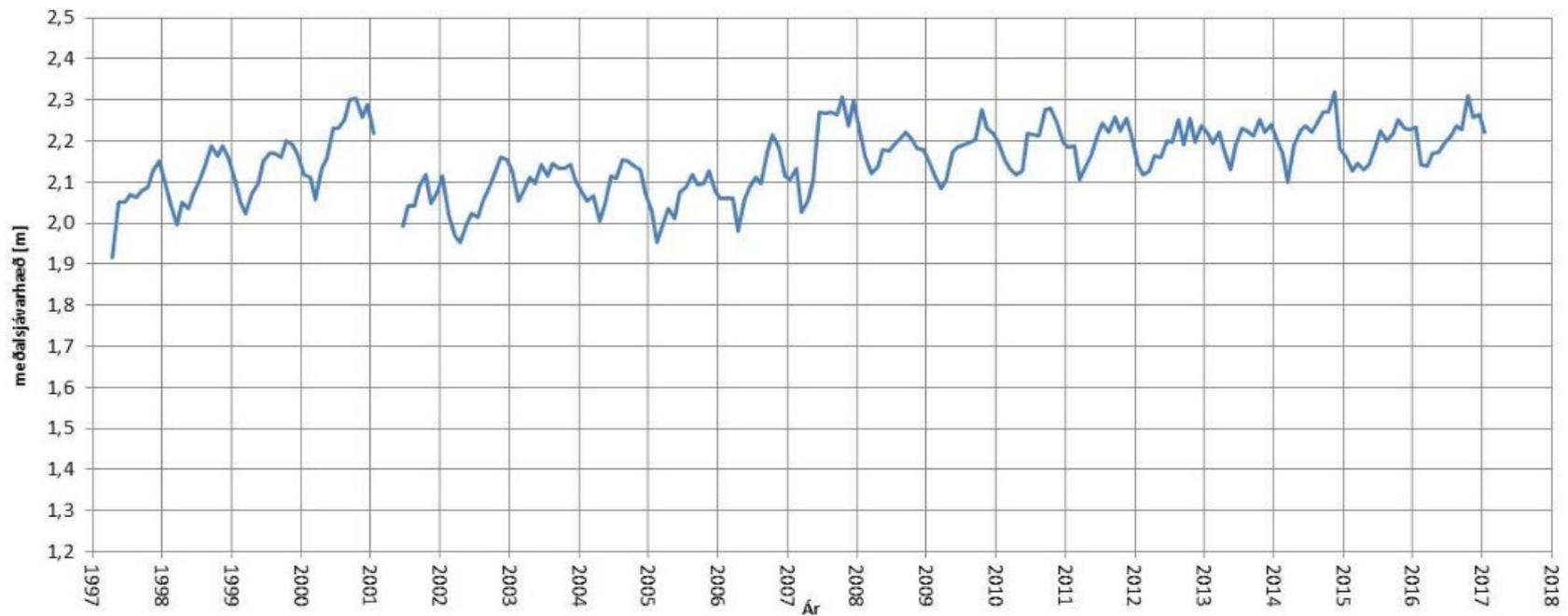
- Analysis of historical data
- Guðjón Scheving 2016 - 2017
 - Höfn í Hornafirði, Grindavík, Landeyjahöfn, Ólafsvík, Skagaströnd, Patreksfjörður, Reykjavík
 - Investigate data quality
 - Calculate astronomical tides parameters
 - Evaluate sealevel changes
 - Analyse extreme events and extrapolate return periods
- Matthías Á Jónsson ofl. 2017
 - Patreksfjörður og Reykjavík
 - Analyse extreme events, extrapolate return periods, calculate astronomical tide param

Tide gauges experieces

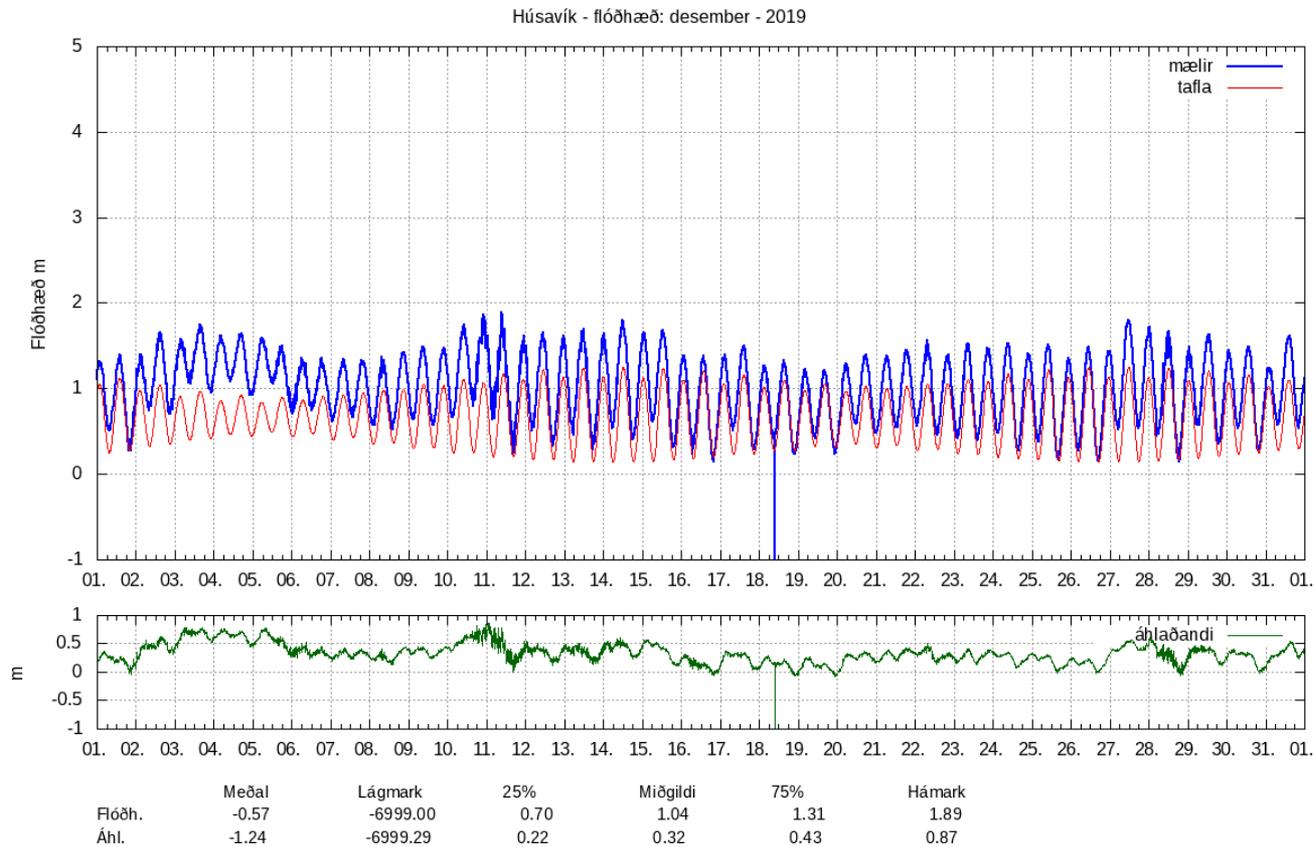
- Guðjón Scheving:
 - „The gauges generally perform satisfactorily as indicators of day to day tide levels“
 - „... need more frequent calibration of tide gauges, need to register faults and need regular maintenance.“

Tide gauges experiences

Mánaðarmeðaltöl Ólafsvík, leiðrétt er fyrir loftþr.



Tide gauges experieces

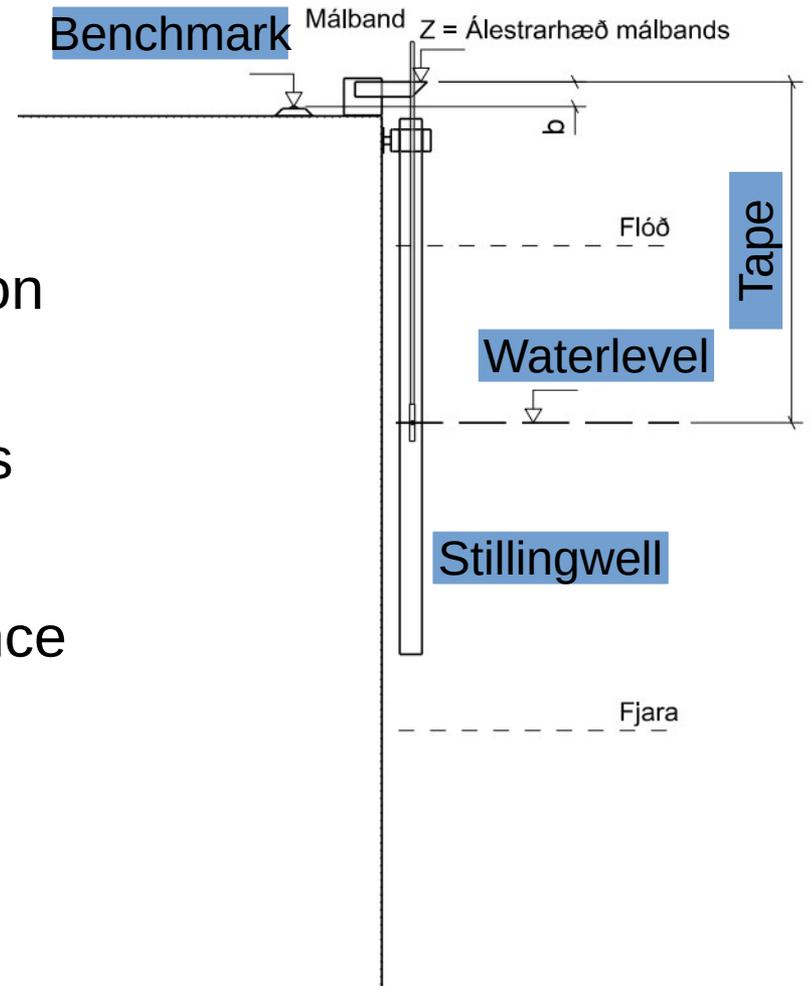


Tide gauges

- IRCA's goal
 - „... remove and prevent systematic errors and improve data accuracy. Coordinate practises in operation of gauges and evaluation of data.“
 - Strengthen network
 - Introduce new means to aid operations
 - Install new gauges
 - Data quality indicators

Tide gauges

- Controll of readings
 - Survey water surface elevation by hand
 - Determine “offsets” of gauges
- Benchmarks
 - Need revision and maintenance
 - 2-3 at any time
- Problem: moving water surface
 - Can overcome using special methods and/or tools



Tide board (staff gauge)

- “Nearest thing to an ideal tide gauge”
 - No automatic readings
- Level zero on tide board to benchmark
- Anyone can read



Choice of instrument

- Float
- Pressure transducer
- Laser/radar
- Ultra sonic
- Stilling well or no stilling well ?
- No final solution
 - Prefer adaptable universal methods

Pressure transducer

- Matured technology
 - Barometer compensation
 - Temperature compensation
 - Good longterm stability
- Extra calibration coefficient
 - Seawater density
- Fouling of sensor



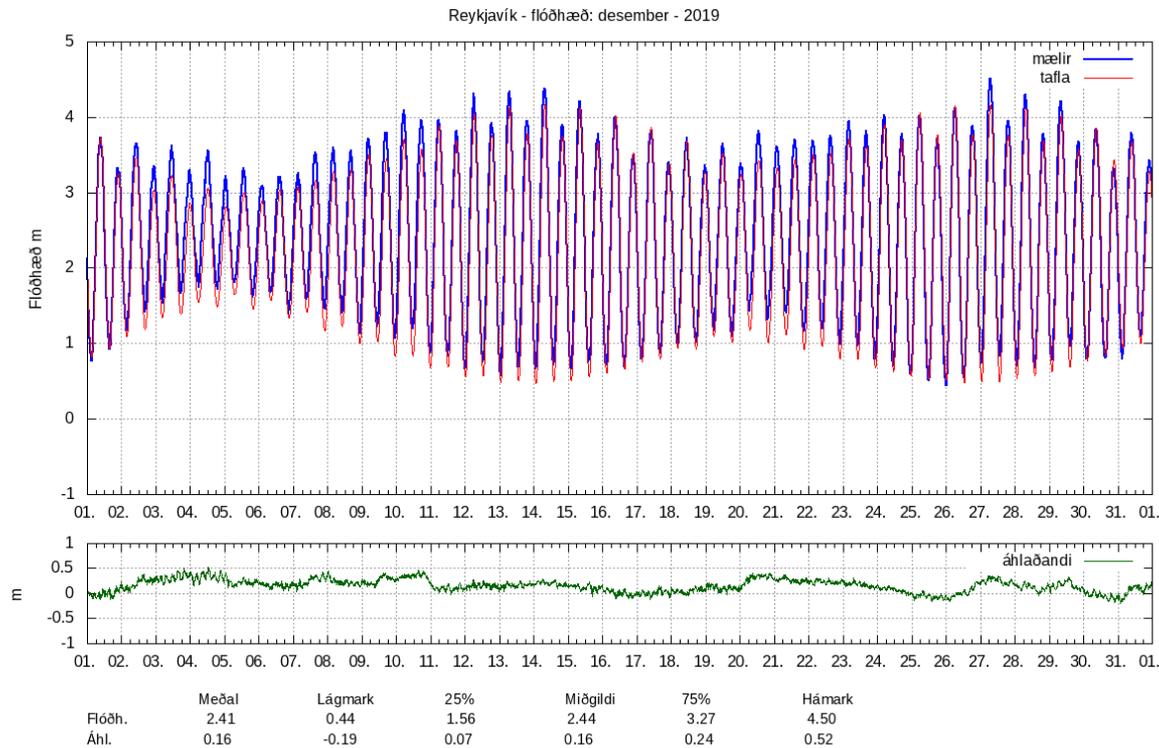
Other types of instruments

- Radar
- Ultrasonic
- Pros
 - Non contact
- Cons
 - Little experience in longterm deployment
 - Bulky installation
 - Somewhat extensive processing



Continuous quality control

- Basic statistics and comparison with reference data



Summary

- Present tide gauge network design philosophy
 - Can do more if we share the work
 - Decentralised ownership
 - Best intentions
- However...
 - Sealevel data from tide gauges is important
 - Need reliable data
 - Long homogeneous timeseries

Summary

- IRCA's role
 - Reviewing role in planning of areas close to the coast, incl harbours and roads
 - responsible for coastal protection
- Future work
 - Add new gauges in locations where sealevel data is lacking
 - Install new benchmarks and tide boards
 - Perform calibrations and checks

