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# Flood Early Warning in Asia, exploring new solutions

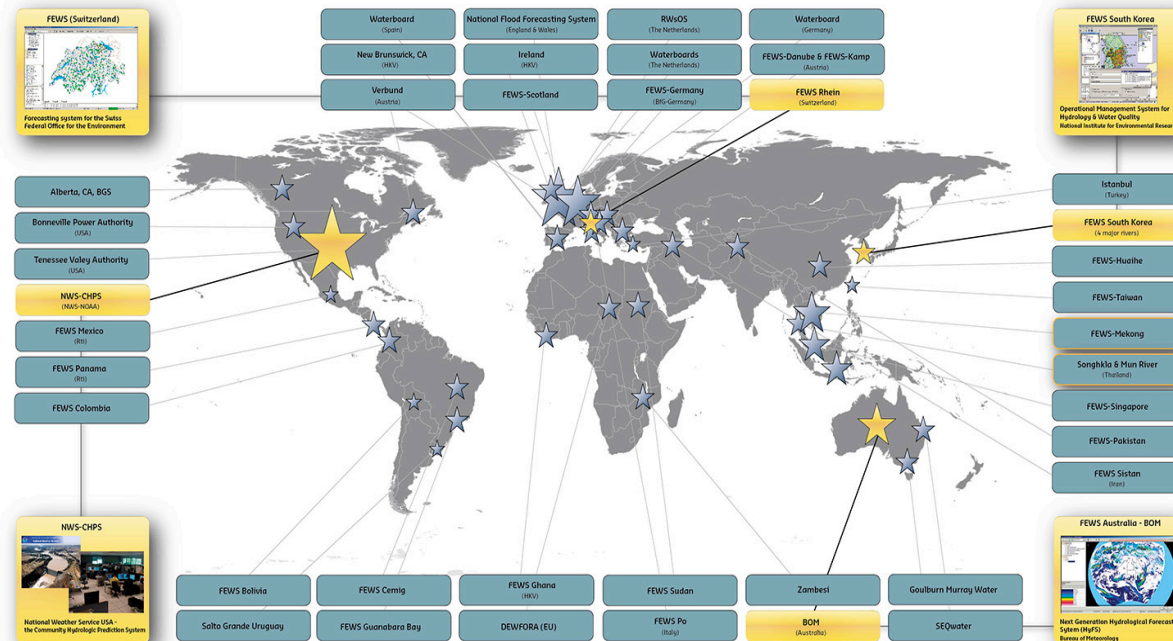
**Daniel Twigt**

**Deltares (The Netherlands)**

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# Delft-FEWS and Flood Early Warning

## Delft-FEWS as platform for operational systems worldwide

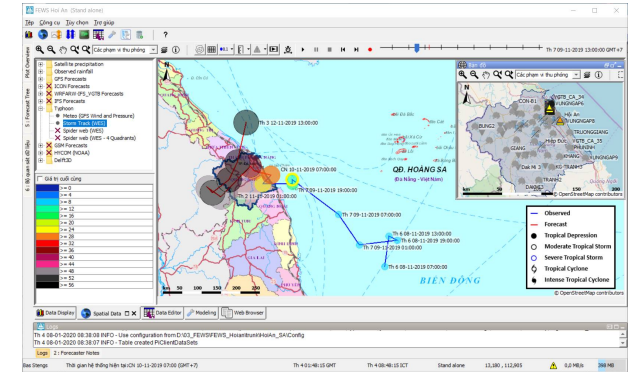


- Delft-FEWS provides an open shell system for managing forecasting processes and/or handling time series data.
- Delft-FEWS incorporates a wide range of general data handling utilities, while providing an open interface to any external (forecasting) model.

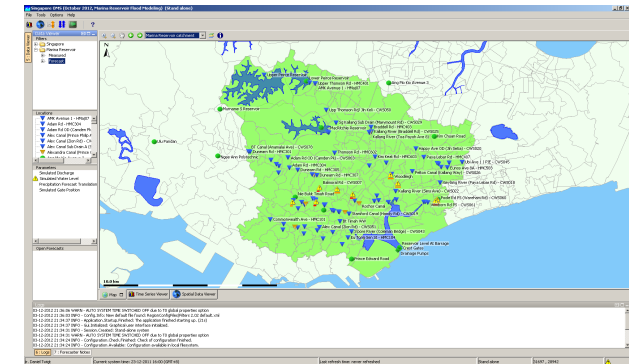
- The modular and highly configurable nature of Delft-FEWS allows it to be used effectively for data storage and retrieval tasks, simple forecasting systems and in highly complex systems utilising a full range of modelling techniques.
- Delft-FEWS can either be deployed in a stand-alone, manually driven environment, or in a fully automated distributed client-server environment.



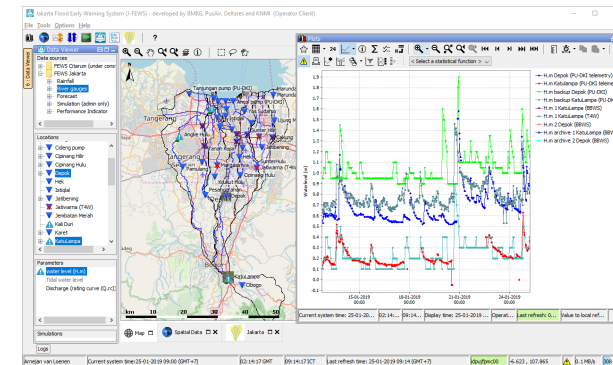
<https://oss.deltares.nl/web/delft-fews/>



Vietnam



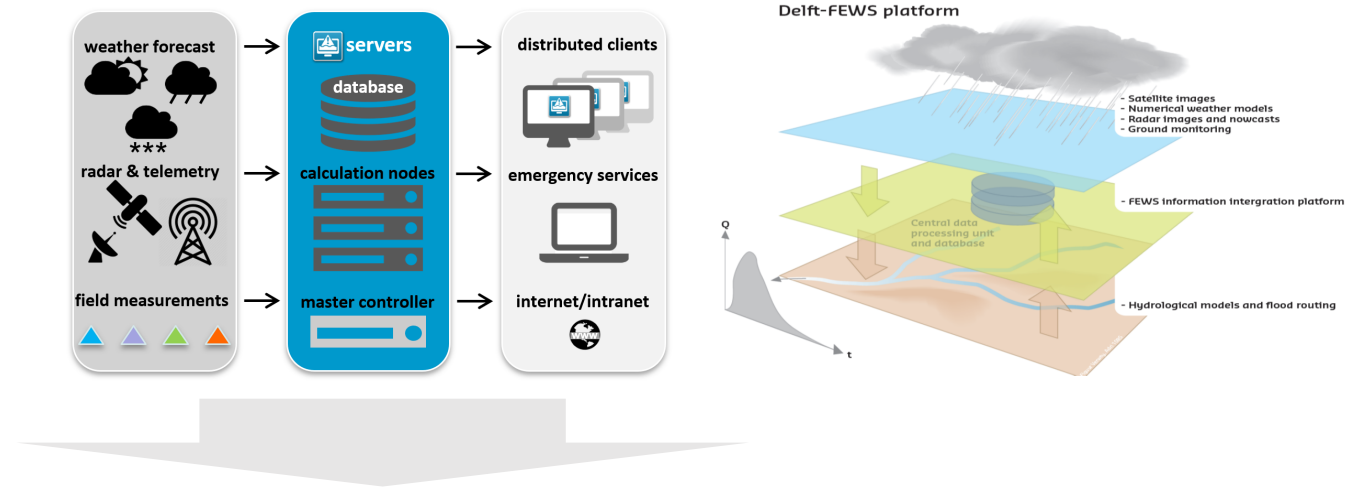
Singapore



Indonesia (J-FEWS)

**Deltares**

# Mainstream Flood Early Warning



## Sparse measurements



<https://www.dutchwatersector.com/>



<https://novalynx.com/>

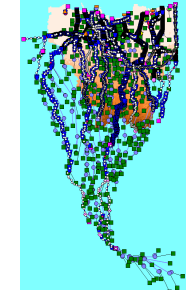


<https://www.newsdeeply.com/>



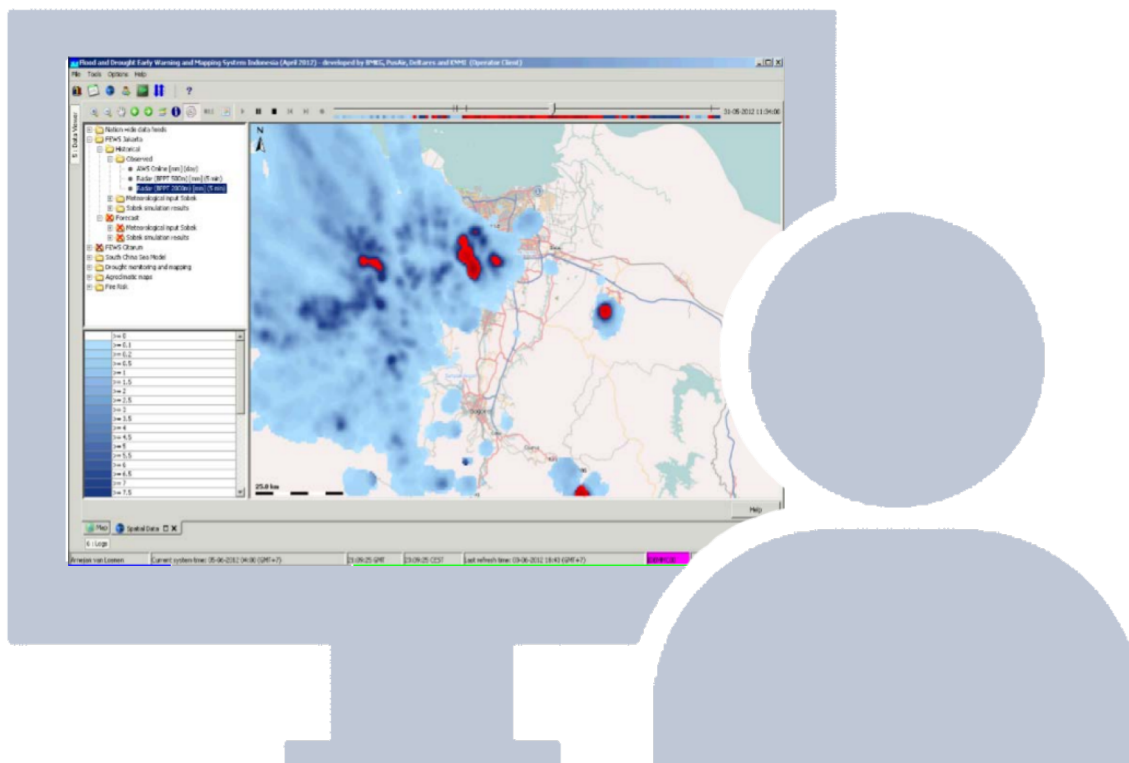
<https://www.furuno.com/>

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## Models

# What is happening on the ground?



What is actually happening on the ground?  
 What is the impact of a flood event?  
 How good was my forecast?



# Exploring different solutions

Currents from ship based AIS

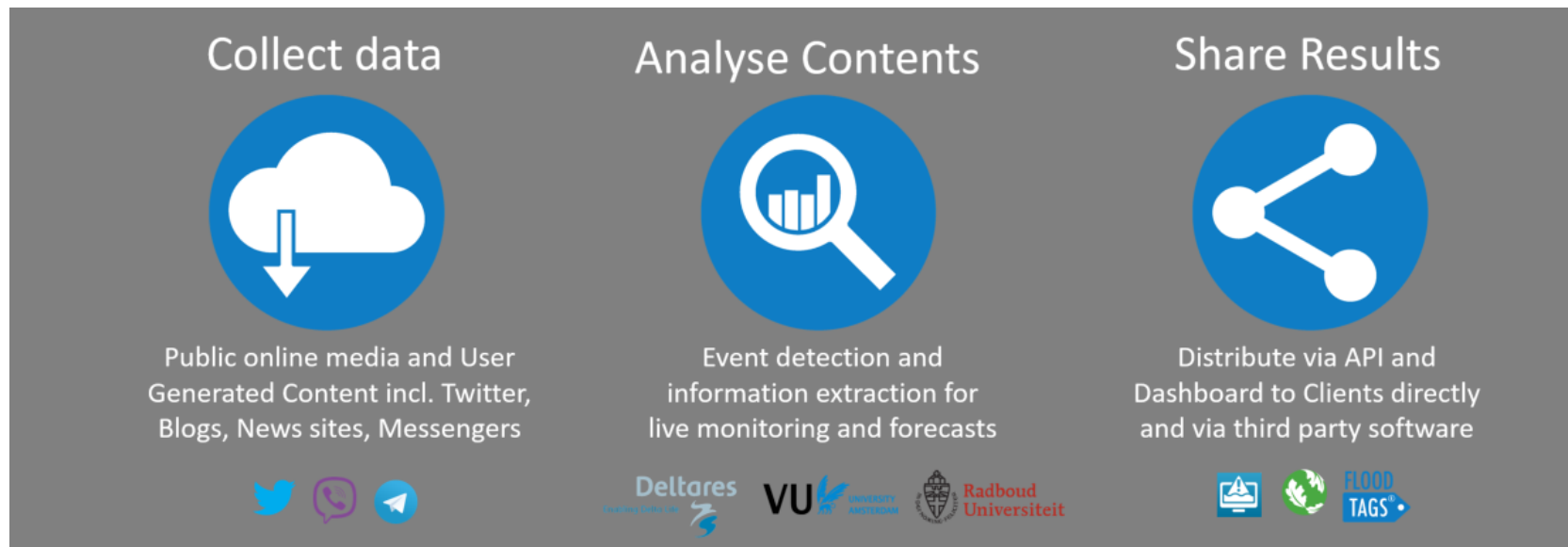
Rainfall estimation from cellular networks

Better DEMs from car navigation

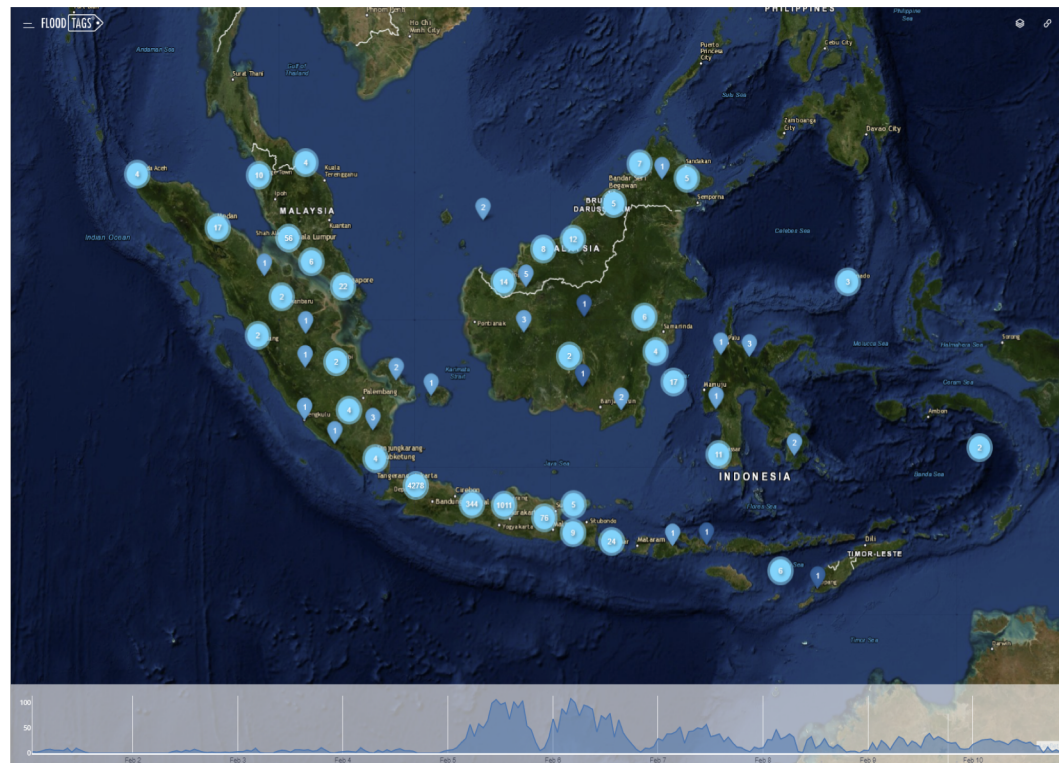
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## Flood mapping and monitoring using online media

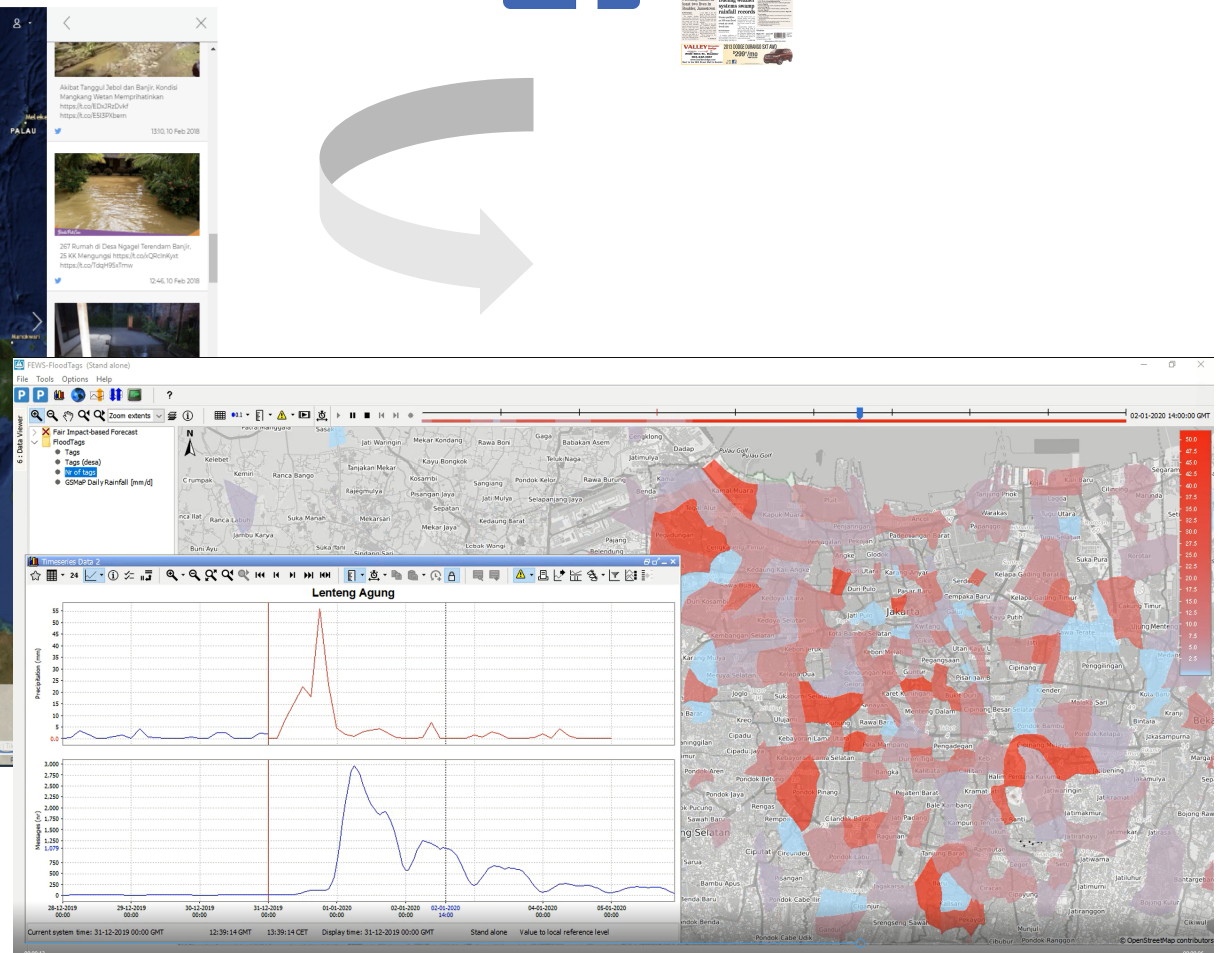
In cooperation with **FloodTags** (<https://www.floodtags.com>)



# Mining online media



<https://www.floodtags.com>



# Mining online media



**Weather input**

**TANZANIA RED CROSS EXTREME WEATHER IMPACT AWARENESS APP – User Agreement**

This Tanzania Red Cross Extreme Weather Impact Awareness APP (TANZANIA RED CROSS EXTREME WEATHER IMPACT AWARENESS APP) is a basic understanding of the forecasted extreme weather in a given province of Tanzania.

And is for use for use by the Tanzania Red Cross Society and entitled to its use by the Tanzania Red Cross Society.

It shows historical impacts from flood events that occurred and conditions in the past in a specific province. These impacts are from online media content.

**User acknowledges and agrees**

a. NEVER TO INTERPRET THE RESULTS OF THIS TANZANIA WEATHER IMPACT APP AS A FORECAST. NEITHER A WEATHER IMPACT APP AS A FORECAST. NEITHER A WEATHER IMPACT APP AS A FORECAST. NEITHER A WEATHER IMPACT APP AS A FORECAST.

b. NEVER TO COMMUNICATE THE RESULTS OF THIS TANZANIA WEATHER IMPACT APP AS AN EARLY WARNING.

c. always, when communicating the results of the TANZANIA WEATHER IMPACT APP to third parties, insert the text: "come and see" and

d. to interpret the results of this TANZANIA RED CROSS EXTREME WEATHER IMPACT APP, you can to ensure not to consider the understanding of the provided URL, to read accompanying media source content of the predicted possible impacts.

**DISCLAIMER**

USE OF THE TANZANIA RED CROSS EXTREME WEATHER IMPACT APP IS AT YOUR OWN RISK. TANZANIA RED CROSS EXTREME WEATHER IMPACT APP IS NOT A FORECAST.

**Weather input**

Province: Dar es Salaam

Weather: Wet (80-150)

forecast: Severe rainfall (

**Historical events**

**Summary:**

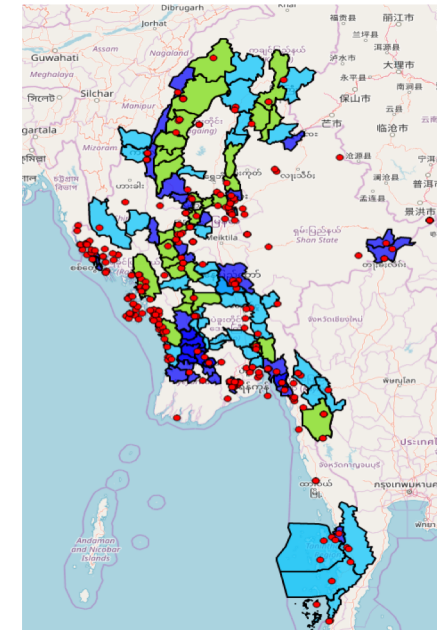
Evacuated: Up to 5000  
Casualties: Up to 7  
Monetary Damages: Up to  
Effects: rains, flooded, floods  
Locations: Dar, Buguruni kwa Mnyamari, Dar es Salaam  
Property Damage: homes, roads, over 510 houses, power lines, Sam Nujoma Road, Shekiango Road, Ali Hassan Mwinyi Road, houses  
Duration in Days: Up to 0 days

**Cases:**

Date	Impact
March 26, 2014	2
March 26, 2014	2
March 21, 2015	2
May 20, 2005	2

**Search**

Impact based forecasting



Model validation

**Individual Chat**

Hello! What is the location of the flood?

FloodTags Bot 15:16

Kibaru ward

Darcy 15:16

What is the approximate water depth?

FloodTags Bot 15:17

< Knee < Waist < Neck > Neck

Up to the knee

Darcy 15:18

Do you have pictures?

FloodTags Bot 15:16

Skip this step Add Pictures

Do you have anything else to share?

FloodTags Bot 15:19

Impact Assistance Other Nope

Nope

Darcy 15:20

Thanks Darcy

FloodTags Bot 15:19

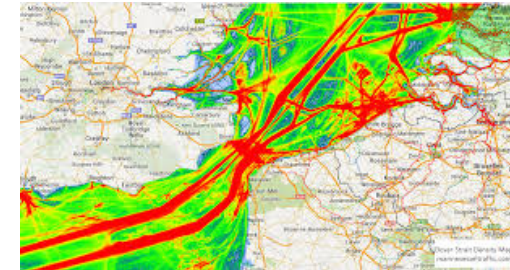
Active user engagement

# Some challenges moving forward

- Access to data (proprietary, asset)
- Getting the signal from the noise
- From qualitative to quantitative data
- From R&D to operations



<https://app.pub.gov.sg/>



<http://www.shiptraffic.net/>

**Your thoughts and ideas?**



# **Deltares**

## **Thank you!**

**Daniel Twigt**

Deltares

[daniel.twigt@deltares.nl](mailto:daniel.twigt@deltares.nl)