

OIL & GAS

# Spredningssimulering

SeaFAN – Seabed Footprint Analyser

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## Et lite partikkeleventyr...

- Det var en gang for lenge siden da oljeprisen var høy...
  - ✓ vi hadde forskningsprosjekter og var ettertraktet
  - ✓ vi deltok på konferanser i fjerne himmelstrøk
  - ✓ vi lekte dronninger og konger og var på karneval
  - ✓ vi hadde til og med julebord
  - ✓ business was good

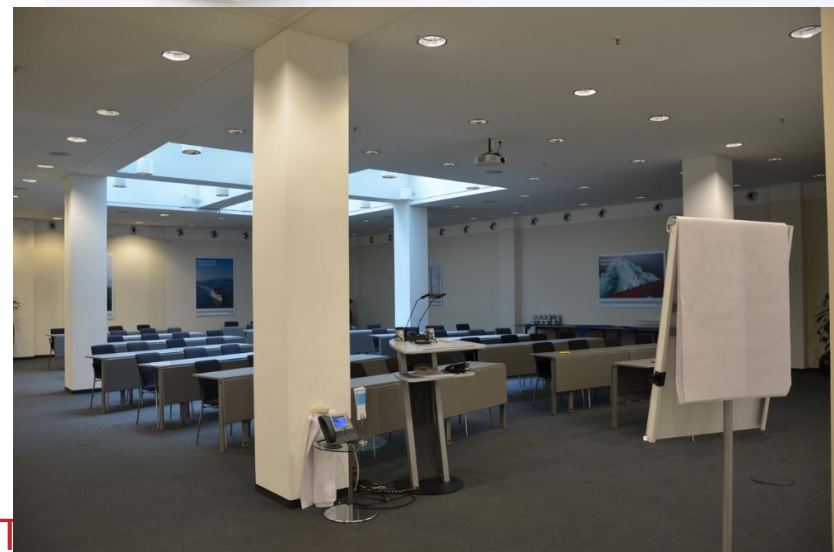


DRAFT

## ..andre tider skulle komme...

.. og oljeprisen falt....

- ✓ Brikkene begynte å ramle
- ✓ Kontorer ble tømt
- ✓ Den 4. revolusjon ristet i oss
- ✓ Vi var tvunget til omstilling og tenke veldig veldig hardt og lenge!



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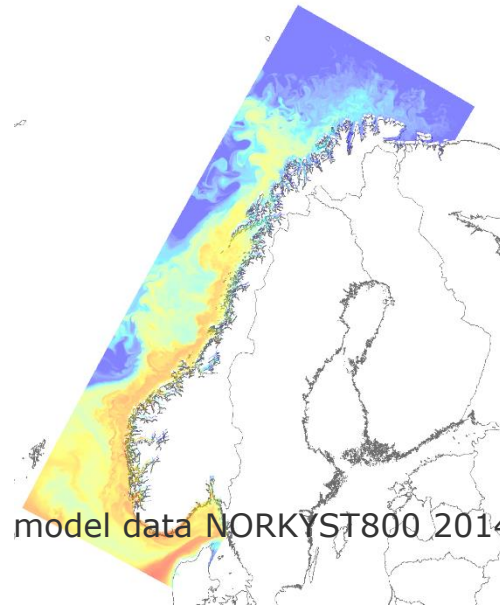
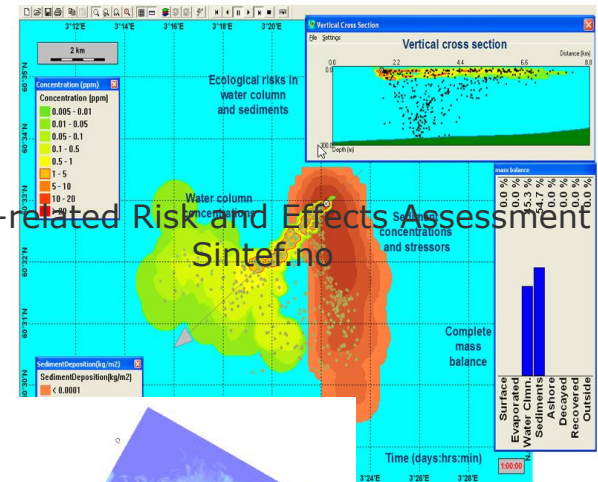
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# ..etter langt om lenge hørte vi rop som sa..

Jeg fant jeg fant...

- ✓ En spredningsmodell vi ikke hadde brukt på en stund...
- ✓ Inngangsdata som hadde vokst i størrelse og som kunne gi nye muligheter
- ✓ Noen script og programmer som hadde blitt forlagt i en skuff..
- ✓ Kloke hoder, litt hell og lykke

DREAM (Dose-related Risk and Effects Assessment Mode



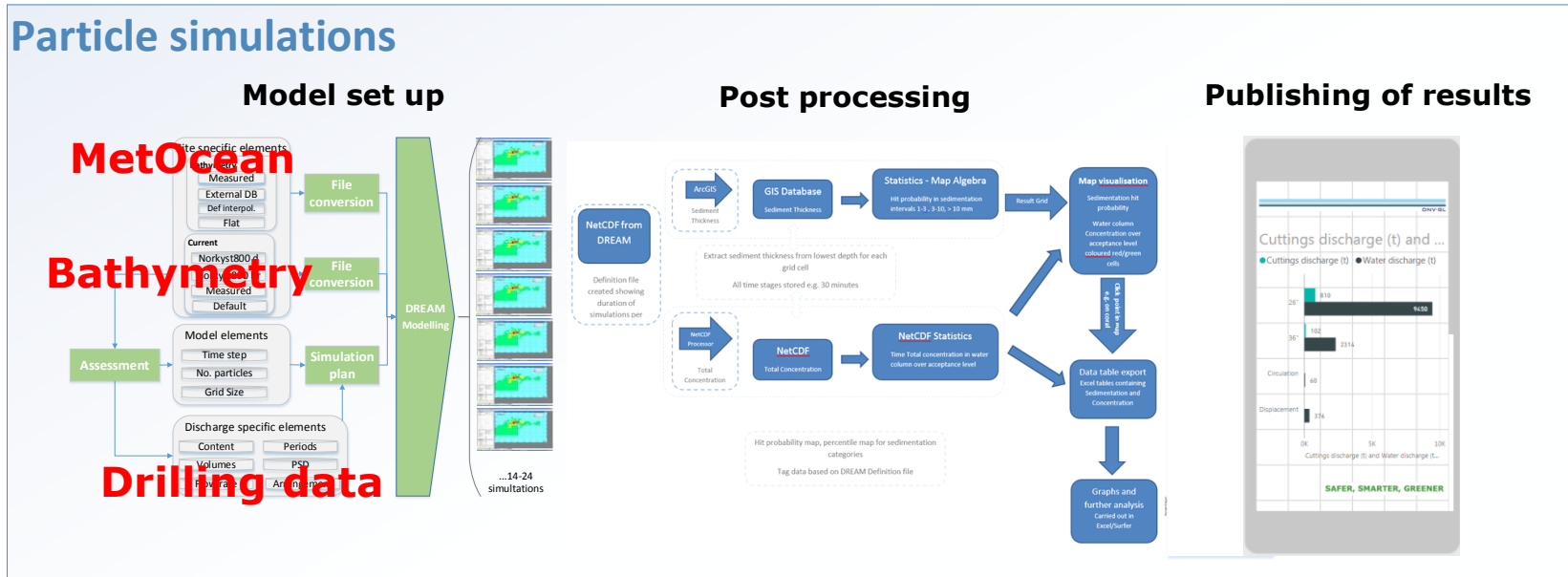
MetOcean model data NORKYST800 2014--- met.no

# SeaFAN – Seabed Footprint Analyser – by use of the DREAM model

1600 datapunkter



1,5 mrd datapunkter



Manual labour



Automated solution

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Digital deliverables

# Leveranser

← Project | [SeaFAN\\_demo](#)

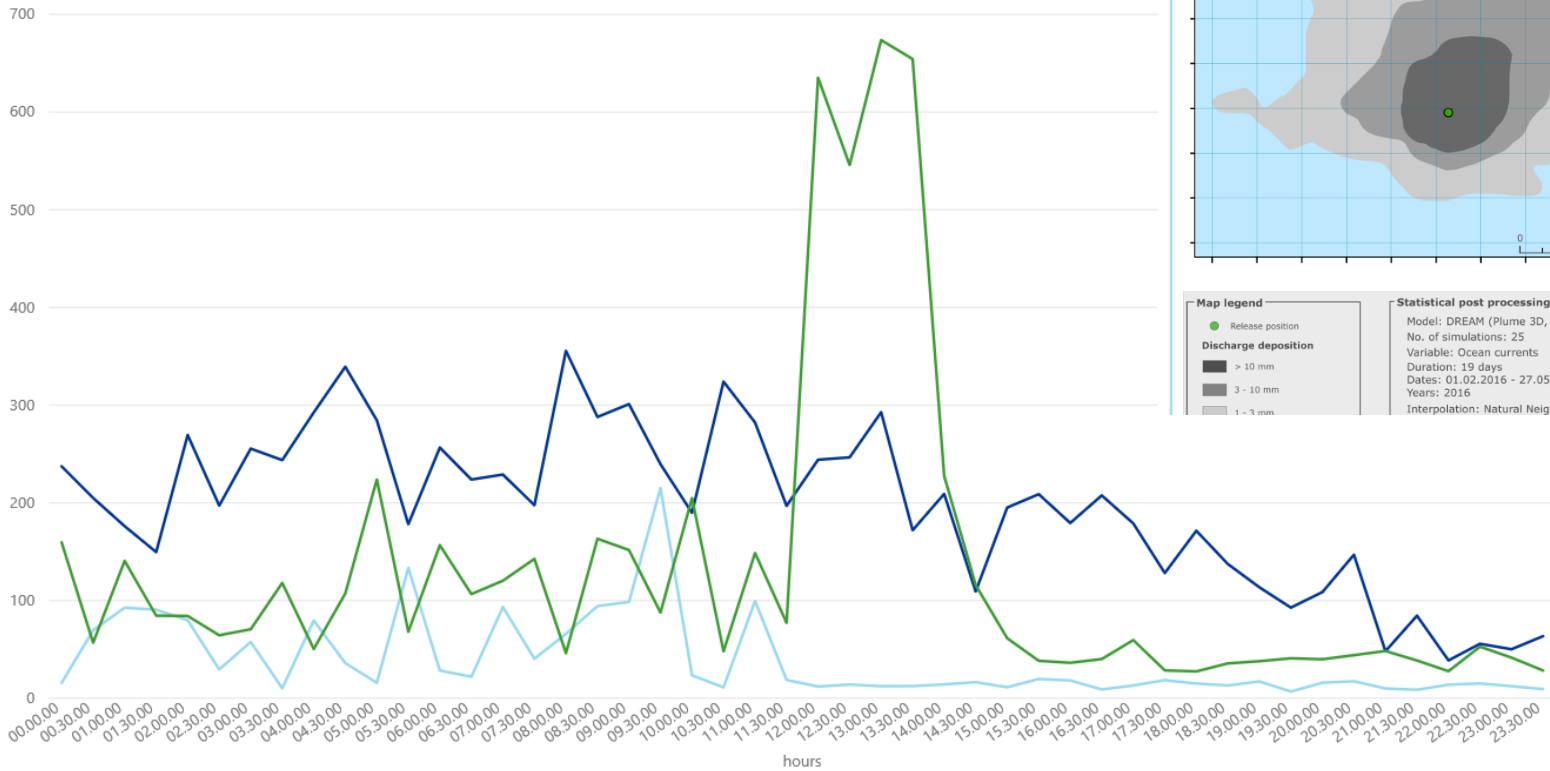
[SeaFAN](#) [Discharge plan](#) [Sedimentation](#) [Suspended Solids - Activity](#) [Suspended Solids - Magnitude of Variati](#)



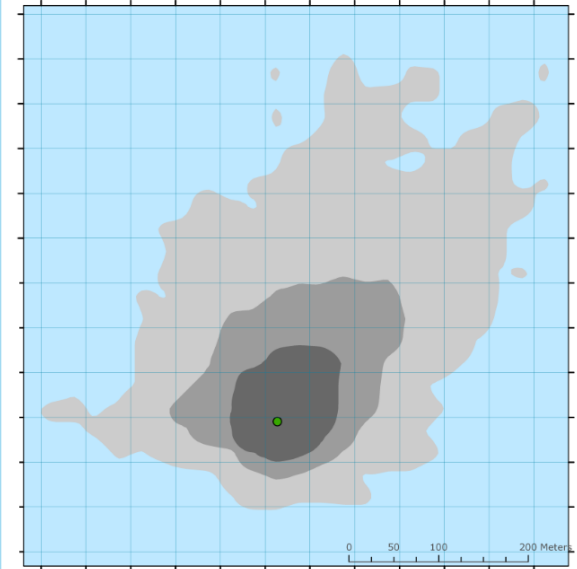
← Tilbake til rapport

MAXIMUM MG/L BY PROGRESSION

GRID\_ID ● 81316 ● 84235 ● 86320



## Drilling Discharge Footprint Analysis 10 Percentile Simulation Chart



<p><b>Map legend</b></p> <ul style="list-style-type: none"> <li>● Release position</li> <li><b>Discharge deposition</b></li> <li>■ &gt; 10 mm</li> <li>■ 3 - 10 mm</li> <li>■ 1 - 3 mm</li> </ul>	<p><b>Statistical post processing</b></p> <p>Model: DREAM (Plume 3D, ParTrack)          No. of simulations: 25          Variable: Ocean currents          Duration: 19 days          Dates: 01.02.2016 - 27.05.2016          Years: 2016          Interpolation: Natural Neighbor</p>
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## DEMO – online?

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

# Output and visualization: Dashboard - examples



## Suspended Solids - Activity

Grid ID

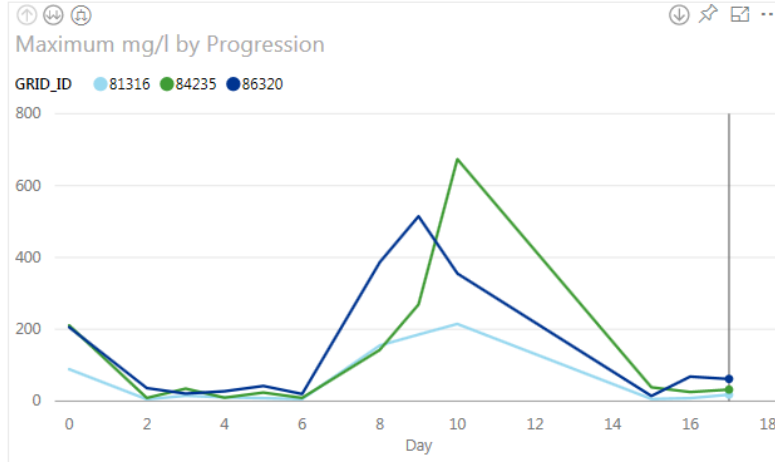
- 86320
- 84235
- 81316

Activity

- 36"
- 9 7/8"
- 26"
- 17 1/2"

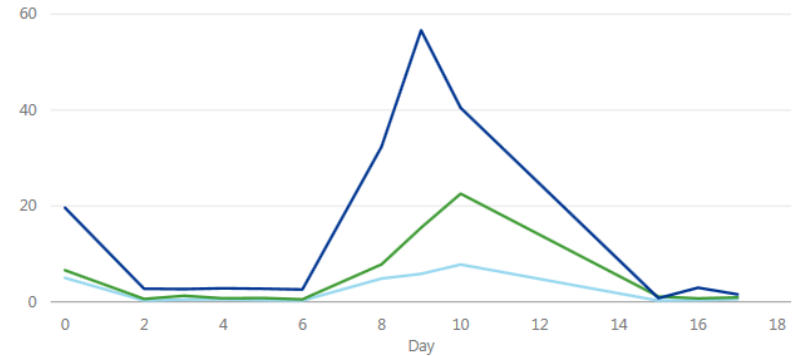
Interval mg/l

- Velg alle
- 0-1
- 1-5
- 5-10
- 10-20
- 20-30
- 30-40
- 40-50
- 50-100
- 100-550



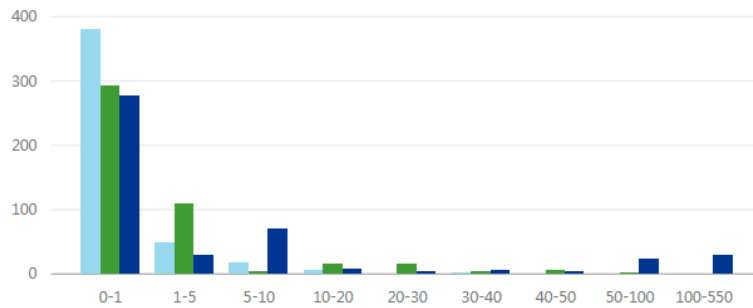
Average mg/l by Progression

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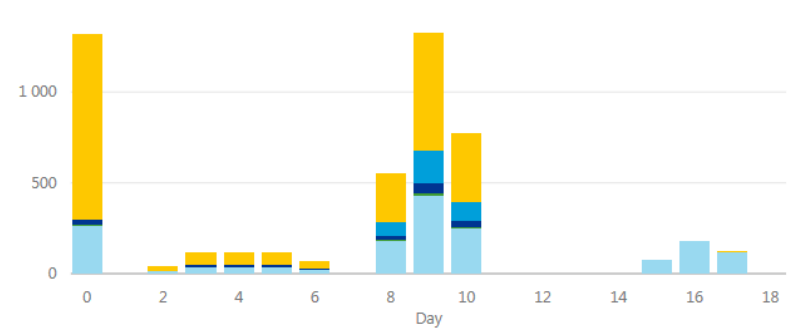
Hourly Concentration by Interval

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Modelled Discharges by Progression

Cuttings (t) Bentonite (t) Barite (t) KCL (t) Water (t)





# Summary and application of use

## Benefits

1. To reduce the environmental footprint from discharges
2. Comply with regulatory requirements
3. Creation of sustainability targets

## Planning phase:

- Use for discharge management
- Use in areas where there are valued ecological resources
- Use when there is particular type of discharges such as TSS
- Use for benchmark measures

## Operational phase:

- Use in areas where there are valued ecological resources
- Use when there is planned for mitigating actions if thresholds are exceeded

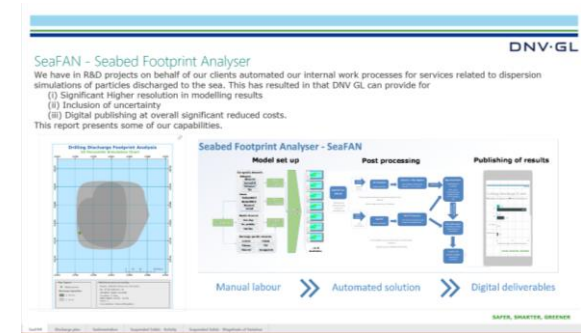
## Post phase:

- Use in areas where there are valued ecological resources
- Use for documentation purposes
- Use for benchmark measures

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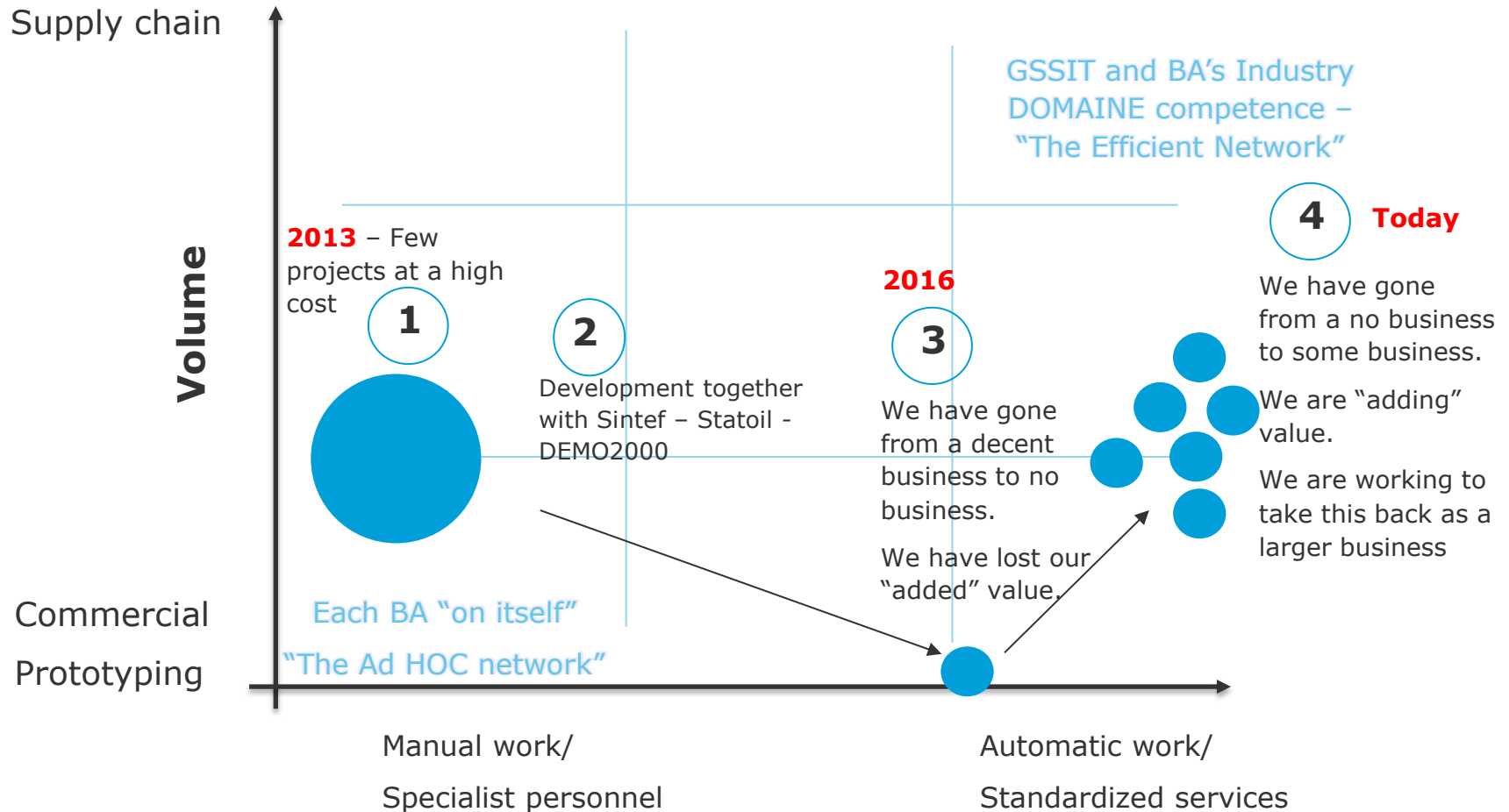
## SeaFAN



- Higher resolution
- Inclusion of uncertainty
- Digital publishing
- Significant reduced costs
- DB and benchmarking
- New measures

# SeaFAN Business model - from prototyping to supply chain

We are working to take this back as a larger business



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# Thank you

## **SeaFAN**

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**SAFER, SMARTER, GREENER**

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