

# DHI UK & IRELAND SYMPOSIUM 2017

## Ongoing developments

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## Module Overview for MIKE 21 and MIKE 3

	MIKE 21	MIKE 3
Hydrodynamics	X	X
<b><u>Environment:</u></b>		
Advection-Dispersion	X	X
Oil Spill	X	X
ECO Lab	X	X
ABM Lab	X	X
Underwater Acoustics		X
<b><u>Sediments:</u></b>		
Sand Transport	X	X
• 2D Shoreline Modelling	X	
Mud Transport	X	X
Particle Tracking	X	X
<b><u>Waves:</u></b>		
Spectral Waves	X	
Boussinesq Waves	X	
Parabolic Mild Slope Waves	X	
Elliptic Mild Slope Waves	X	
<b><u>Maritime:</u></b>		
Mooring Analysis	X	

# Agenda

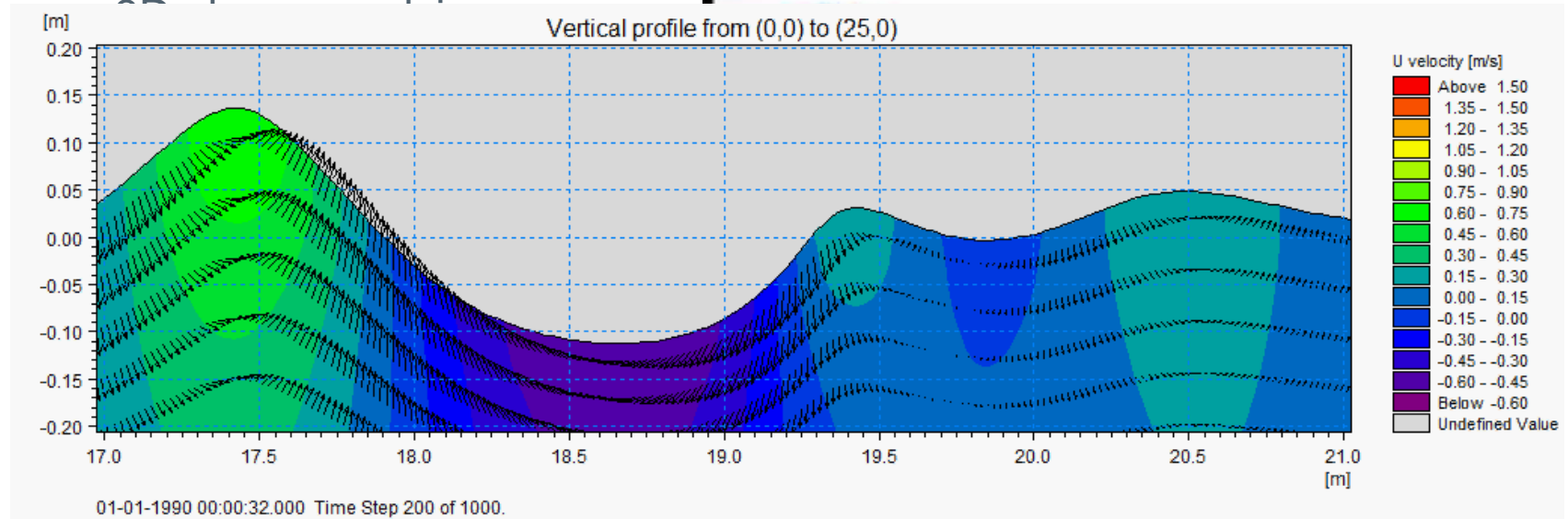
- Engines
  - MIKE 3 Wave FM
  - Multifraction Sediment model
- Value added shops (Engines & data)
  - DHI Metocean Data Portal
  - Boundary Conditions for MIKE 3 HD
  - Vessel Hulls for MIKE 21 MA
- Ways of working
  - MIKE Operations

# 01

## New engine developments

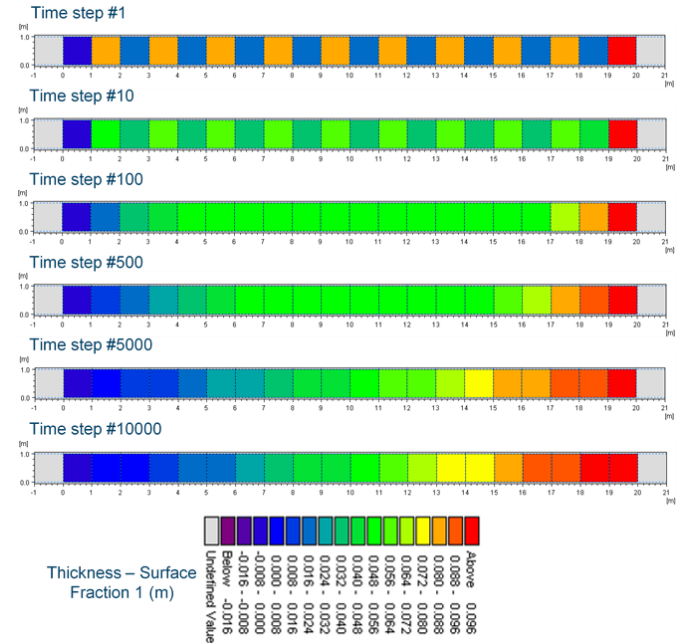
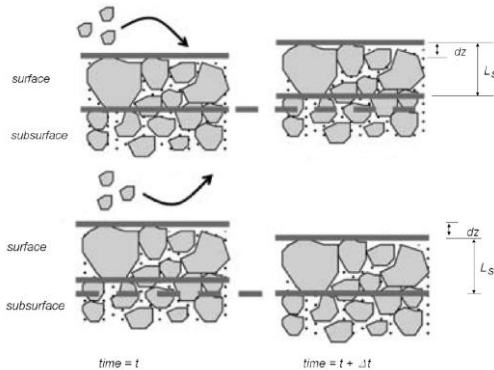
# New engines: MIKE 3 Wave FM

- MIKE 3 Wave:



# New Multi-Fraction Sediment Transport Model Including Bed Armouring and Bed Stratification

- New multi-fraction sediment transport model for mixed sand-gravel sediment
- Includes bed armouring and bed stratification mechanisms



02

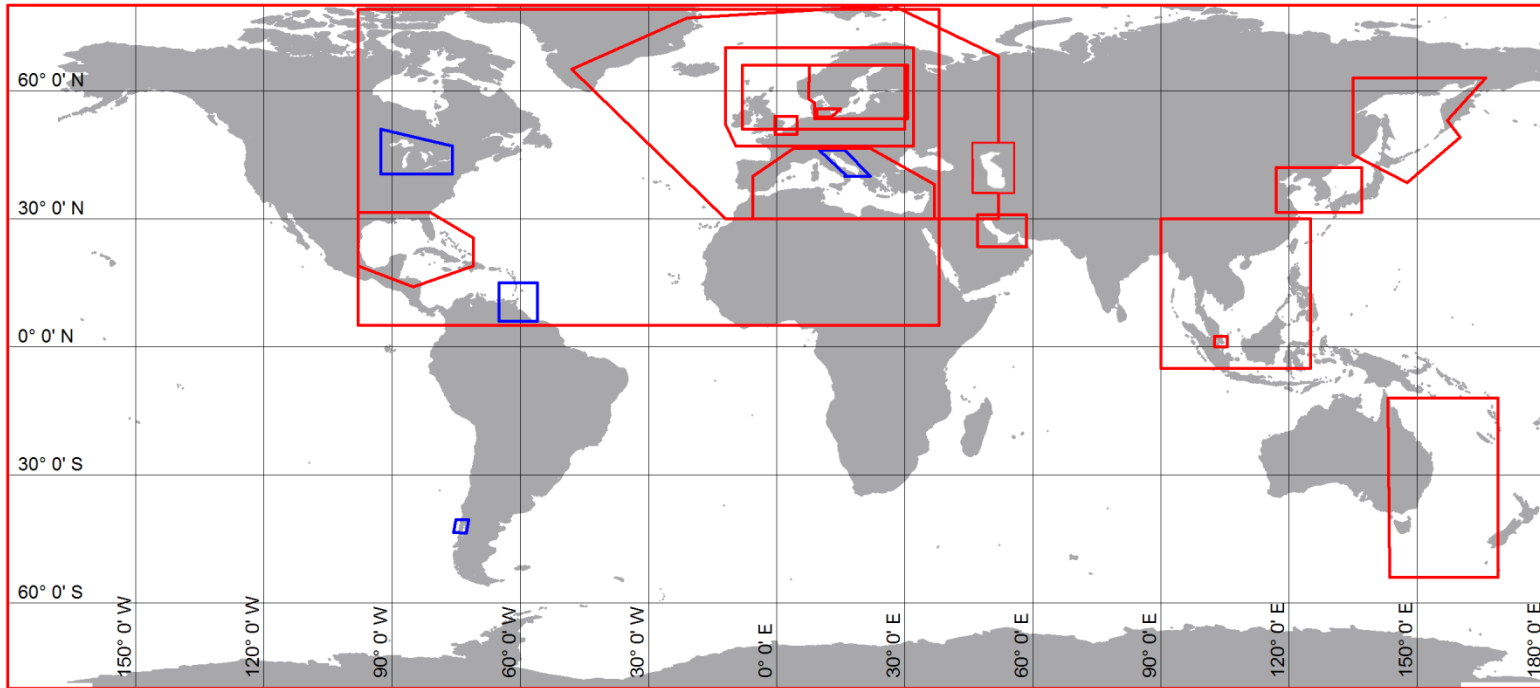
# Value Added Shop 1: DHI Metocean Data Portal

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- Provide instant access to meteorological and oceanographic hindcast data and analytics
- Status: prototype running at: <http://www.metocean-on-demand.com>



# Dataset overview



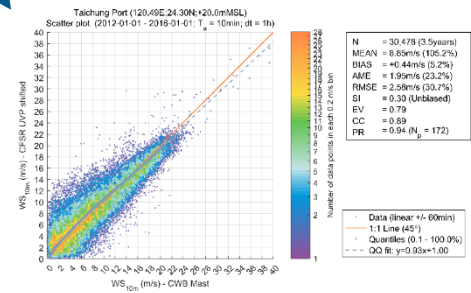
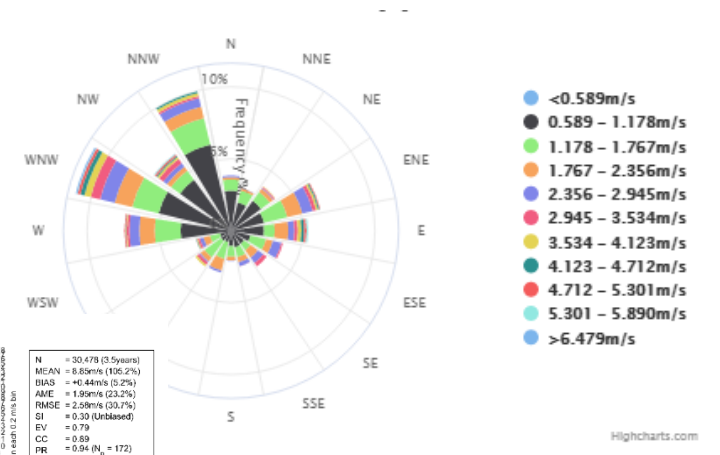
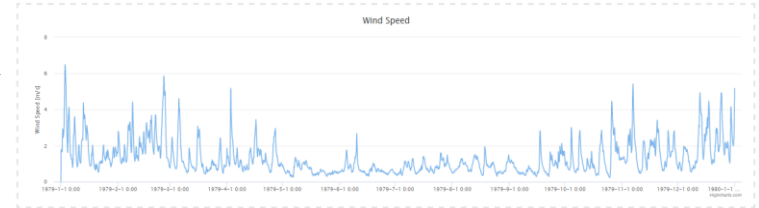
# Dataset overview

<i>Area,</i>	<i>Category,</i>	<i>Source,</i>	<i>Publisher,</i>
• <u>Now:</u>			
• Dutch Waters,	Water Level and Current (2D),	MIKE 21 Hydrodynamic model,	DHI,
• Dutch Waters,	Wave Parameters (Integrated),	MIKE 21 Spectral Wave model,	DHI,
• Global,	Wind Parameters at 10m,	Climate Forecast System Reanalysis (CFSR),	NCEP NOAA,
• Global,	Wave Parameters (Integrated),	MIKE 21 Spectral Wave Model (GWM),	DHI,
• <u>Coming:</u>			
• North Europe,	Wave Parameters (Integrated),	MIKE 21 Spectral Wave Model,	DHI,
• North Europe,	Wave Spectra (Directional),	MIKE 21 Spectral Wave Model,	DHI,
• North Europe,	Water Level and Current (2D),	MIKE 21 Hydrodynamic model,	DHI,
• Mediterranean,	Wave Parameters (Integrated),	MIKE 21 Spectral Wave Model (MWM),	DHI,
• Global,	Water Level and Current (3D),	Hybrid Coordinate Ocean Model (HYCOM),	HYCOM,
• Global,	Tidal Level and Constituents,	Ocean Tide Model (DTU10),	DTU Space,
• Global,	Wind Speed and Wave Height,	Satellite Altimeter Observations,	NASA,
• Global,	Wind Speed and Direction,	Satellite Scatterometer Observations,	NASA,
• The Gulf,	Wave Parameters (Integrated),	MIKE 21 Spectral Wave Model (PERGOS),	DHI,
• South China Sea,	Wave Parameters (Integrated),	MIKE 21 Spectral Wave Model,	DHI,
• South China Sea,	Water Level and Current (2D),	MIKE 21 Spectral Wave Model,	DHI,
• Norwegian Seas,	Water Level and Current (3D),	MIKE 3 Hydrodynamic model,	DHI,

# Analytics overview (user-interactive HighChart based image)

- Time Series Plot,
- Altimeter Comparison,
- Scattermeter Comparison,
- Rose Plot,
- Scatter Plot,
- Scatter Table,
- Monthly Statistics,
- Exceedance Probability,
- Weather Windows,
- Extreme Values,
- ...

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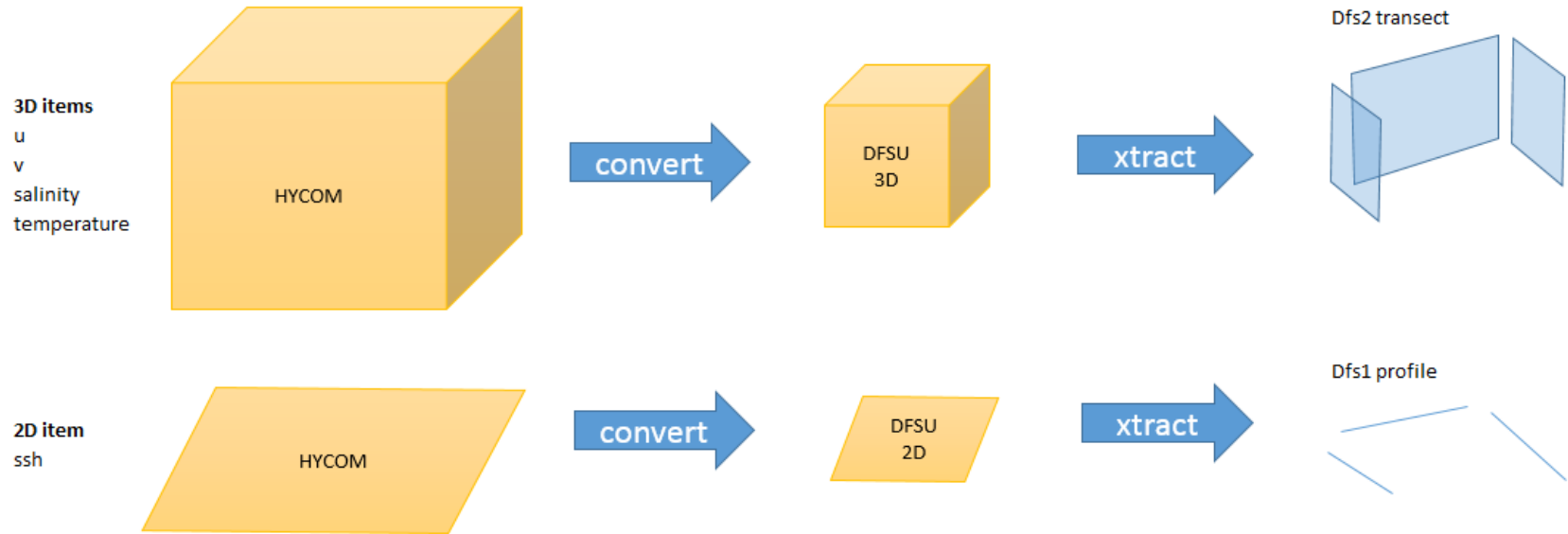
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## Value Added Shop 2: 3D model preparation tool

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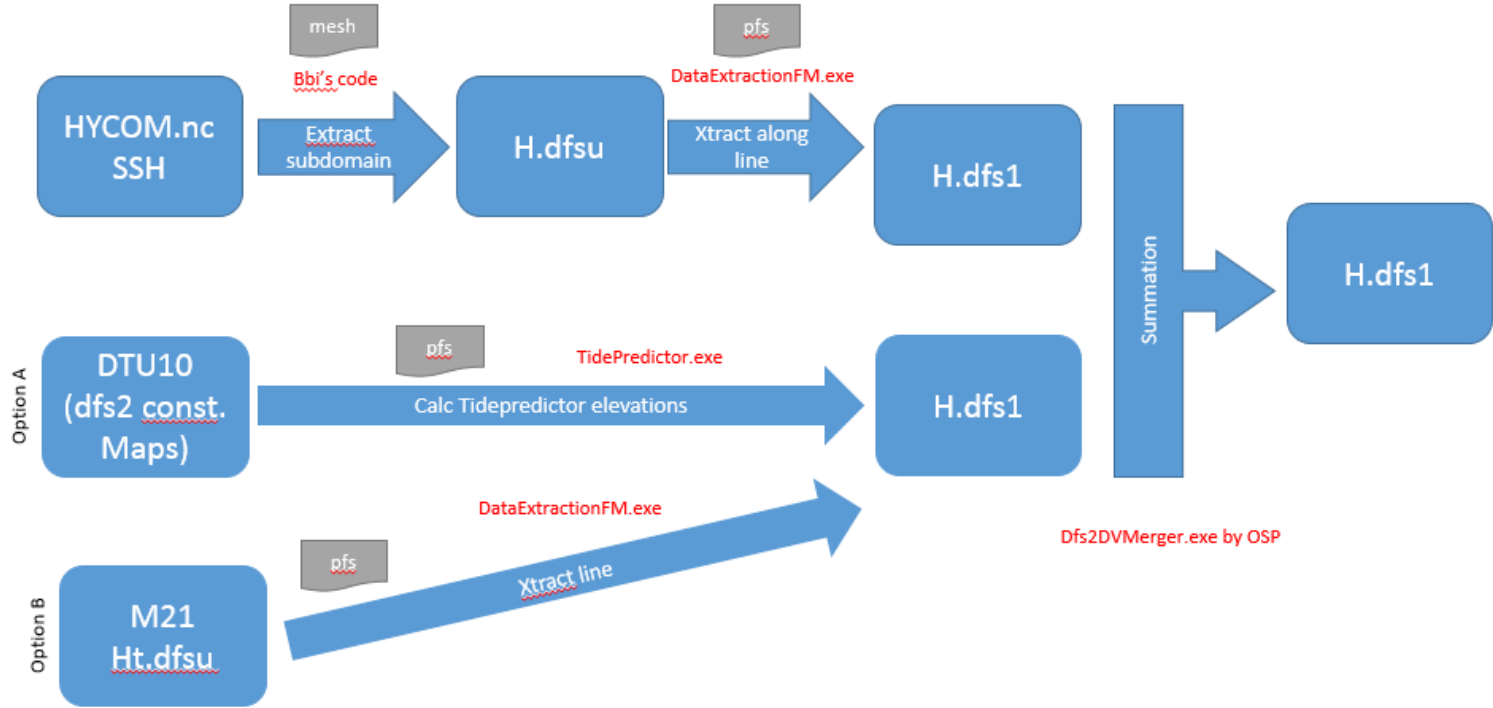
- Step 1: Boundary conditions and initial conditions on open boundaries
- Status: expected to go live in October 2017
- The data are initially produced as a combination of HYCOM-data and tidal data

# HYCOM Data Extraction

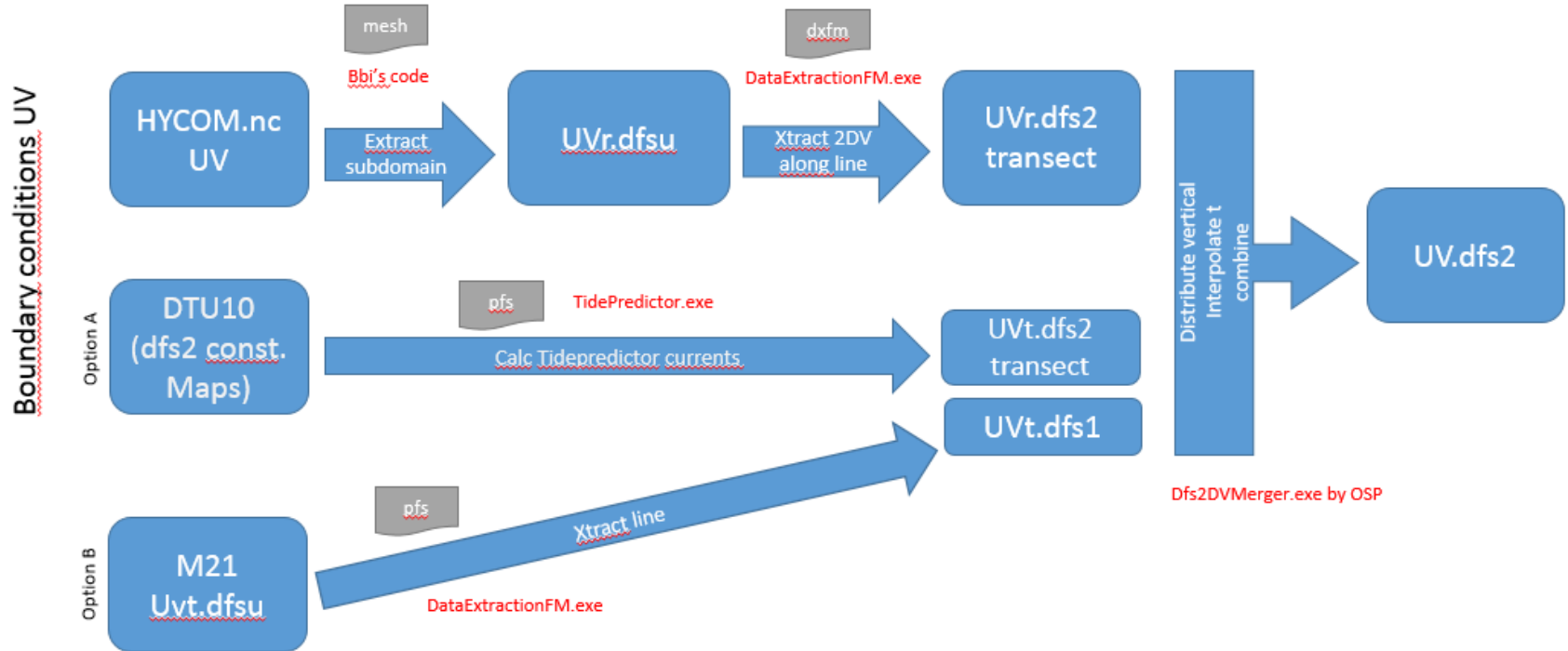


# SSH Processes

Boundary conditions H



# UV Processes



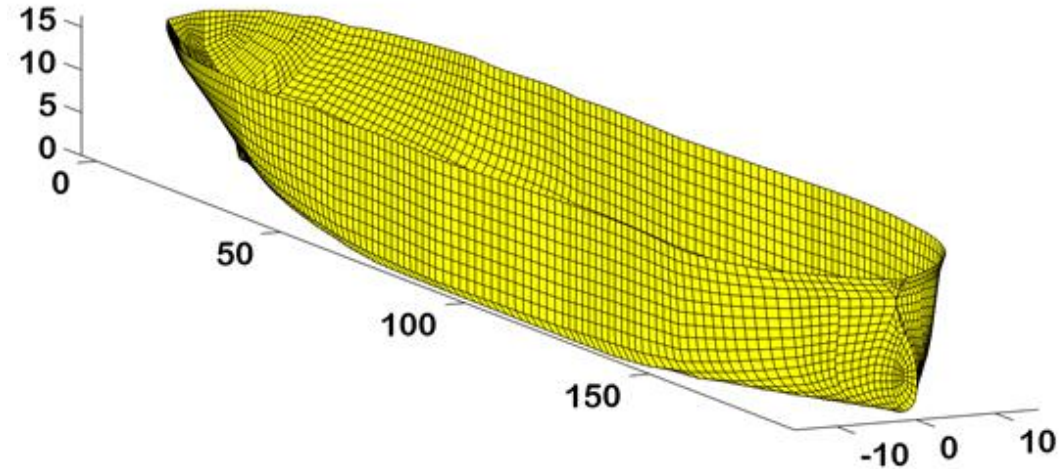


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## Value Added Shop 3: Digitized Vessel Hulls

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- The Mooring Analysis module (MIKE 21 MA) requires input of digitized ship hulls
- 12 hulls are included with the installation
- Initially, 50 additional hulls will be available
- Status: expected in 2017



# 05

## Ways of working

# MIKE Operations for Marine applications

- **MIKE Operations for Marine applications:** Tools for automatic model execution
  - Schedule automated downloads of data from external sources
  - Automated conversion of external data into correct input data formats
  - Automated execution of MIKE 21 models in real time
  - Automated data extraction and result presentation

# Thank you

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