Low water challenges in Inland Navigation

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The beautiful story of inland navigation

VERVOER OVER WATER BIEDT KANSEN

Een standaard 3000-ton(s) binnenschip neemt eenvoudig de lading over van 100 vrachtwagens.
2018 a view in a future with climate change
January all dams closed for high water - 7 months of low water
Challenges

• Navigation challenges
• River management challenges
• Information technology challenges
• Ship technology challenges
Navigation

Navigation: all actions the skipper must perform to bring the vessel "safely" from the place of departure to the place of arrival.
Skipper “reads” the river

Navigating is using the forces of nature.
Current patterns of ships
Bernoulli's principle states that an increase in the speed of a fluid occurs simultaneously with a decrease of the water surface.
Current patterns of ships

Squat

The squat effect is the hydrodynamic phenomenon by which a vessel moving quickly through shallow water creates an area of lowered pressure that causes the ship to be closer to the riverbed than would otherwise be expected.
Nautical Challenges

- Keel clearance
- Narrow fairway
- Congestion
- Complex navigation
Challenges in River management

- Navigation challenges
- River management challenges
- Information technology challenges
- Ship technology challenges
Robust and climate proof waterways

Inland Navigation needs robust and climate proof waterways

- Enough depth
- Even current
- Flat riverbed
- Prevent erosion of the riverbed
- Prevent sandbanks
- High- and low water resistant
Nergens is het water lager dan op de Waal, halve meter is 'spoorloos'

NIJMEGEN - Het water in de Nederlandse rivieren staat door de aanhoudende droogte laag. Maar nergens is het zo extreem als op de Waal. Het peil van de rivier is zelfs een halve meter lager dan met de huidige wateraanvoer uit Duitsland zou moeten. Schippers luiden nu de noodklok.

Bron: Gelderlander
Depth Waal - MGD 2,80m

Debiet bij Lobith (m3/s)

Bron: Cornelis van Dorsser
Store and keep water in the system

- Improve pomp capacity by locks
- More locks with water basins
- Buffering of water in the system (extend the water cycle)
Integral River Management - IRM
Challenges in Information technologies

- Navigation challenges
- River management challenges
- Information technology challenges
- Ship technology challenges
Draught information - MGD

- Realtime draught data
- Connecting data – Covadem, authorities, dredging companies
- Long term water forecasts
- MGD in more places
- Early publicity in a wide range
Challenges in Ship technology

- Navigation challenges
- River management challenges
- Information technologies challenges
- Ship technology challenges
What can the inland shipping industry do?

- Decrease depth
- Increase the turnover rate
- Increase capacity - push barges
- Build ships that are more resistant to low water levels
- Alternative propulsion techniques
There is enough space on the waterways to contribute to society wide issues as road traffic congestion and CO2 reduction. But will there be enough water in the river to make it happen?