

**WP 9:
MetOcean services to the
marine transport sector**

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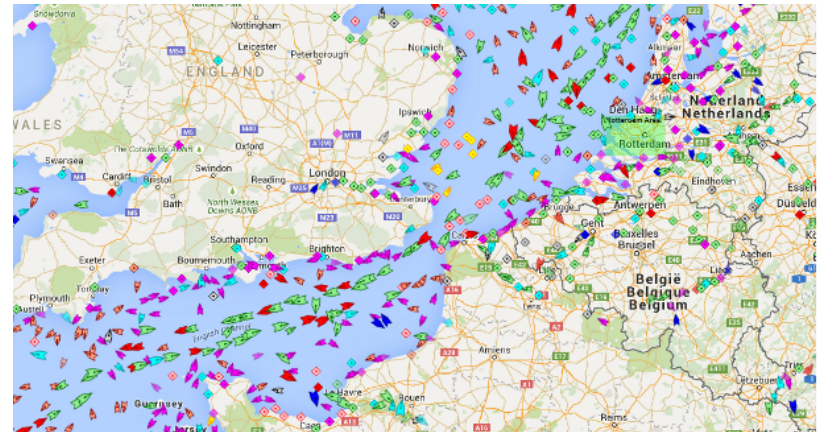
MetOcean services

- Improved ship arrival time estimates
- Improved surface currents (research)

Based on AIS data

AIS Data

- Main purpose: improve shipping safety
 - Data contain: position, speed, and direction
- : low-quality data
- + : lots of them
- + : free data



Simple model for speed variations

Speed over ground =
calm water log speed
+ surface_current
- wind friction
- wave friction

Assumption: calm water log speed varies little on open seas.

Service: ship arrival time estimates

Method:

- Assess present calm water log speed (subtract corrections)
- Estimate future speed over ground (add corrections using MetOcean forecasts)
- Integrate inverse speeds along the route

Similar to arrival time estimates in car navigators

Ship arrival time estimates

Important for planning harbour activities (logistics)

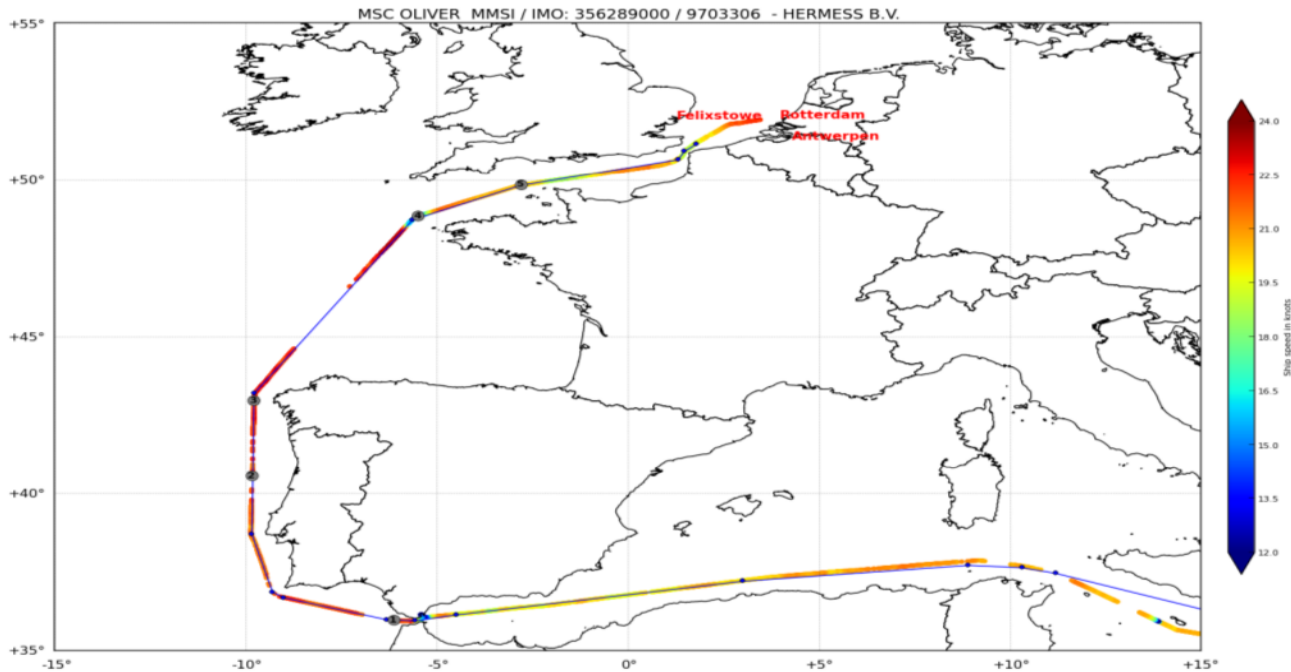
- Customers:
 - harbour authorities
 - Logistic service providers
- Contacts:
 - InterTransis (Netherlands)
 - Bimar (Turkey)

Service demonstration

- Demonstration for a Terminal owner (Rotterdam)
 - Duration: 6 weeks
 - List of ships to Rotterdam, Felixstowe, Antwerp
 - Manual operation: 2 predictions/day
 - Results are collected in an evaluation report

MSC OLIVER	IMO	9703306
	MMSI	356289000
	ETA APMT	17/08/2015 15:00
	Arrived last waypoint	17/08/2015 22:56
	End position	51.1553N, 1.7868E

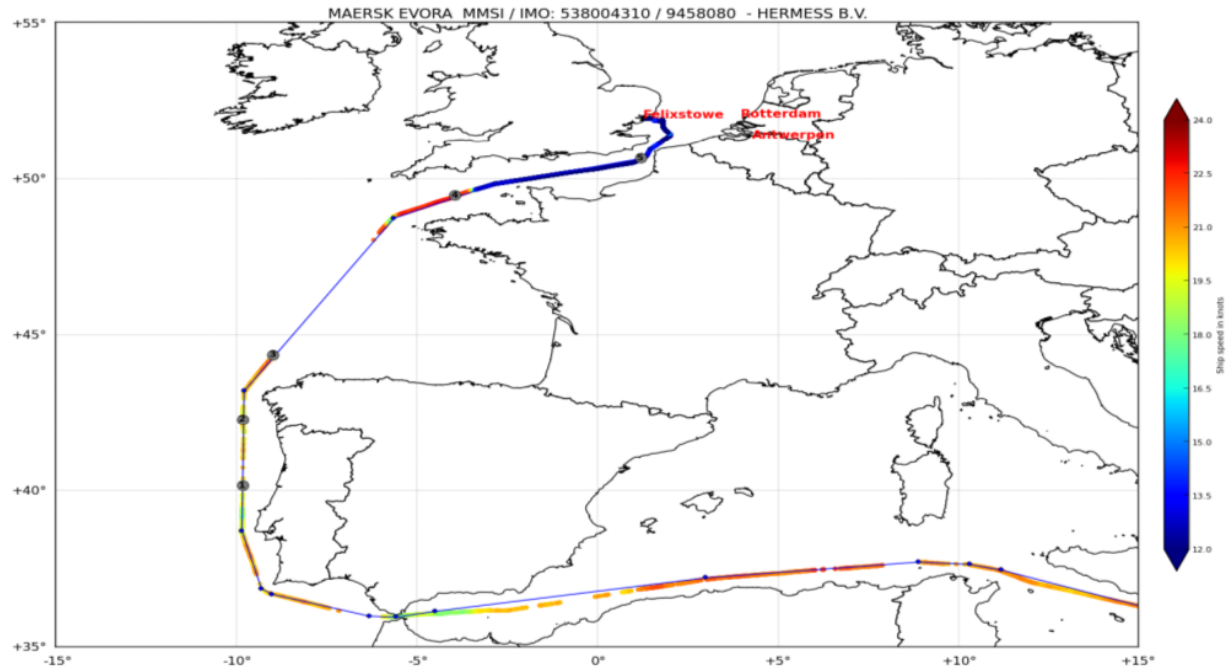
No.	Start date	ETA - Intertransis (UTC)	ETA - Transponder (UTC)	HERMESS		
				ETA last waypoint (UTC)	Hours before arrival	Forecast - Arrived (Hours)
1	15/08/2015 12:14	18/08/2015 04:30	18/08/2015 04:30	17/08/2015 23:25	58.70	0.5
2	16/08/2015 06:17	18/08/2015 04:30	18/08/2015 04:30	17/08/2015 22:30	40.65	-0.4
3	16/08/2015 12:47	18/08/2015 04:30	18/08/2015 04:30	17/08/2015 22:30	34.16	-0.4
4	17/08/2015 06:49	18/08/2015 04:30	18/08/2015 04:30	17/08/2015 23:30	16.12	0.6
5	17/08/2015 12:49	18/08/2015 04:30	18/08/2015 04:30	17/08/2015 22:50	10.12	-0.1



MAERSK EVORA	IMO	9458080
	MMSI	538004310
	ETA APMT	28/08/2015 07:00
	Arrived last waypoint	26/08/2015 09:44
	End position	51.1553N, 1.7868E

No.	Start date	ETA - Intertransis (UTC)	ETA - Transponder (UTC)	HERMESS		
				ETA last waypoint (UTC)	Hours before arrival	Forecast - Arrived (Hours)
1	24/08/2015 06:30	28/08/2015 03:30	26/08/2015 04:15	26/08/2015 01:10	51.24	-8.6
2	24/08/2015 12:50	28/08/2015 03:30	26/08/2015 04:15	26/08/2015 01:00	44.90	-8.7
3	24/08/2015 19:18	28/08/2015 03:30	26/08/2015 04:15	26/08/2015 00:10	38.44	-9.6
4	25/08/2015 12:50	28/08/2015 03:30	26/08/2015 04:15	26/08/2015 00:10	20.90	-9.6
5	26/08/2015 06:50	28/08/2015 03:30	26/08/2015 17:00	26/08/2015 09:37	2.90	-0.1

4) Op 25 augustus om 18:20 bij de ingang van het kanaal is de snelheid gehalveerd

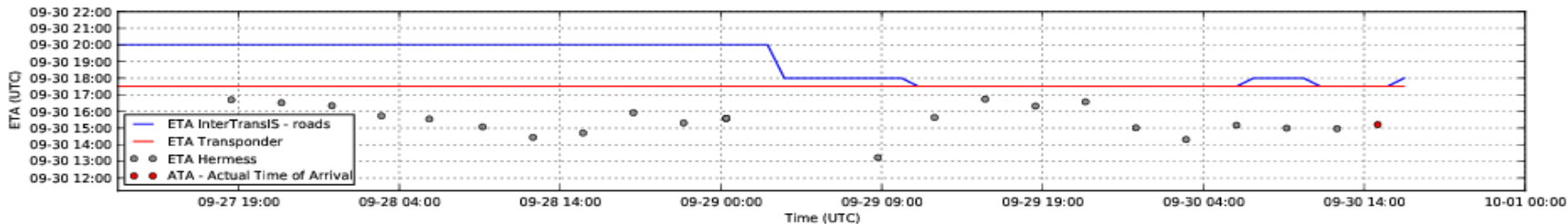
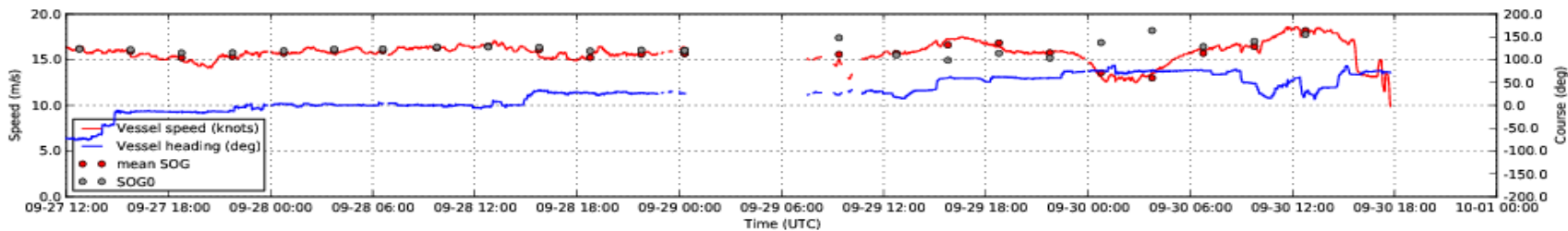
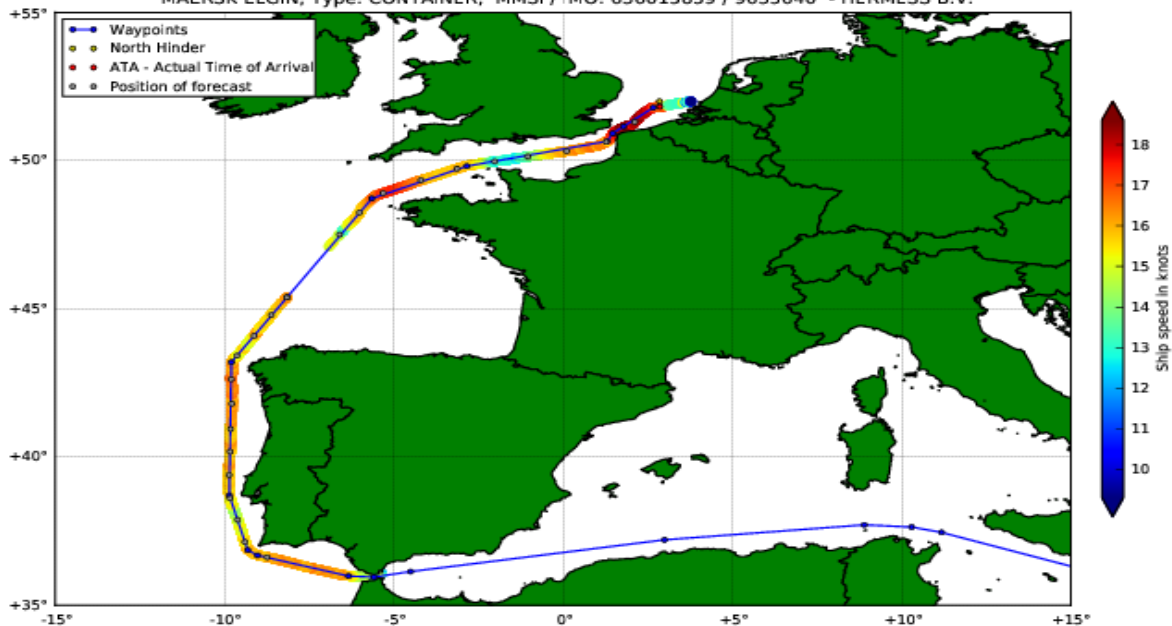


Status service

After the manual version an automatic prototype was completed:

- Needs ship/trip identification number
- Produces ETA predictions every three hours
- Being tested now (collects results for evaluation)
- Only accessible by HERMESS

MAERSK ELGIN, Type: CONTAINER, MMSI / IMO: 636015859 / 9635640 - HERMESS B.V.



TODO

- Connect to MELODIES platform (now possible because HERMESS recently was incorporated into the MELODIES consortium)
- Evaluate archived results (service and model improvements)
- Wanted: satellite AIS data

Improved surface currents: method

Calm water log speed, assessed from AIS, should be constant.

If not:

- Engine power changed

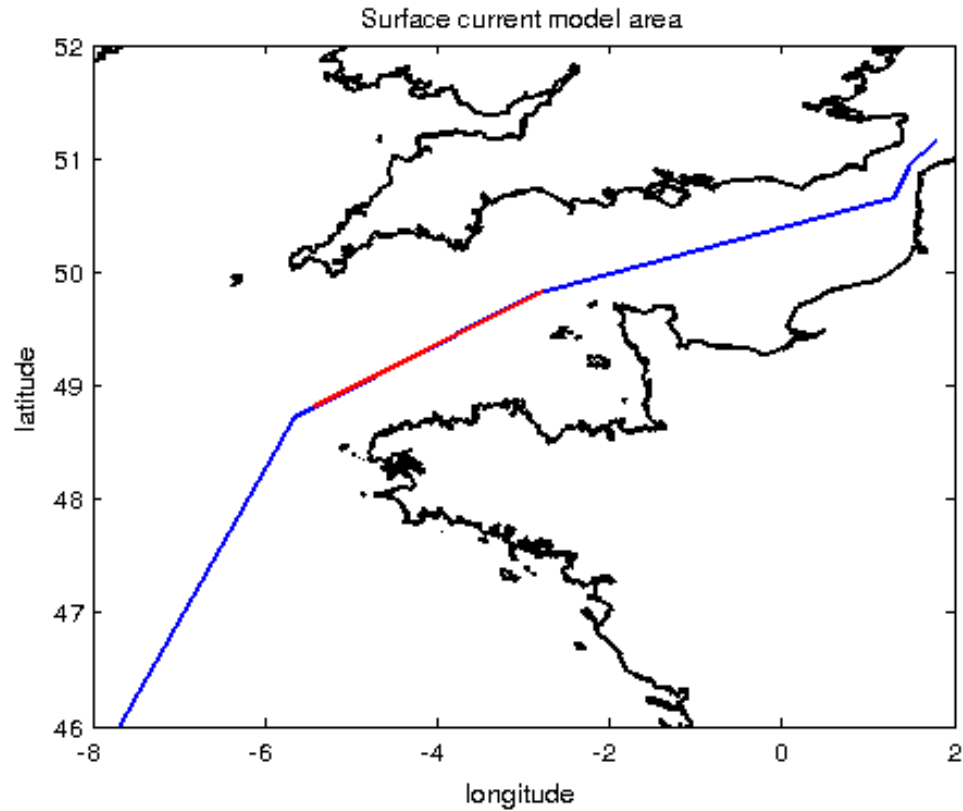
Or

- Model is incorrect

In the last case: probably due to surface currents

Therefore: use AIS to correct surface currents

Case study: Channel area



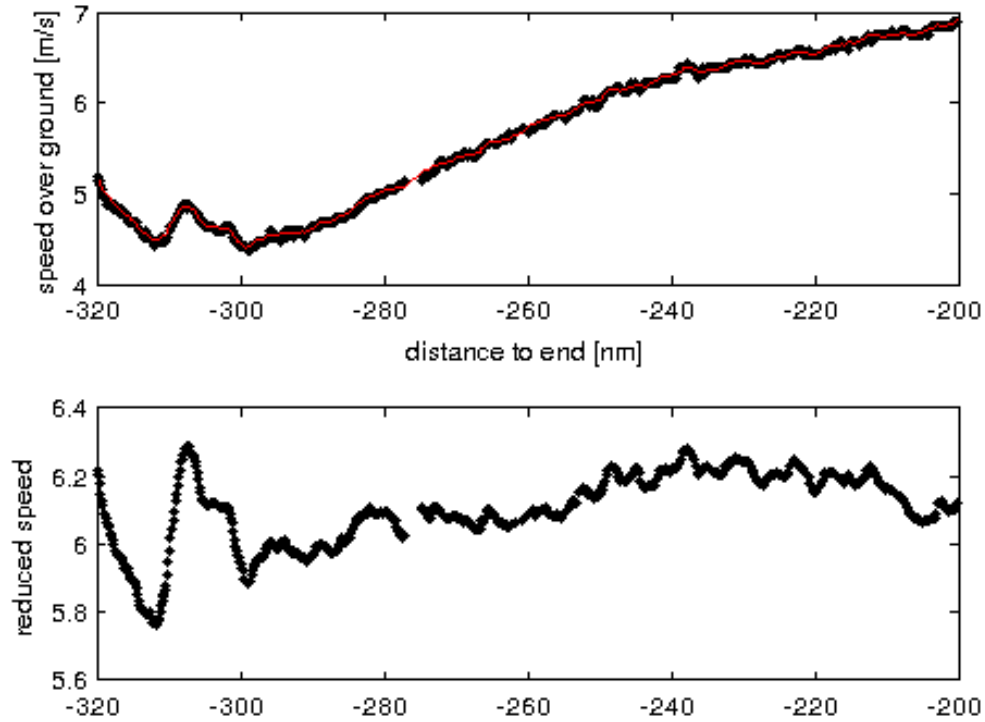
Case study: data

AIS tracks through the Channel area are collected (~900 now, adding ~3/day)

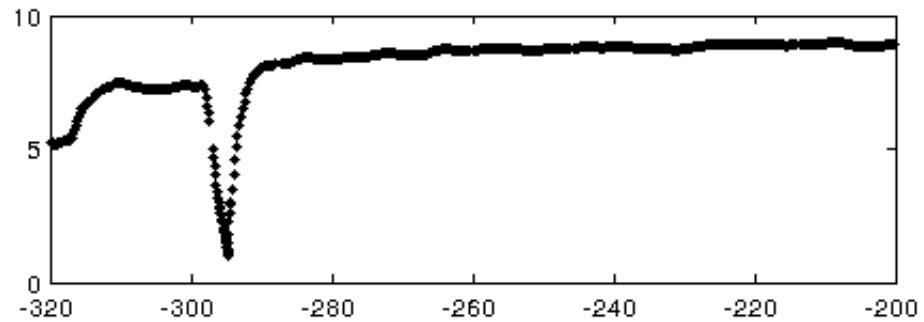
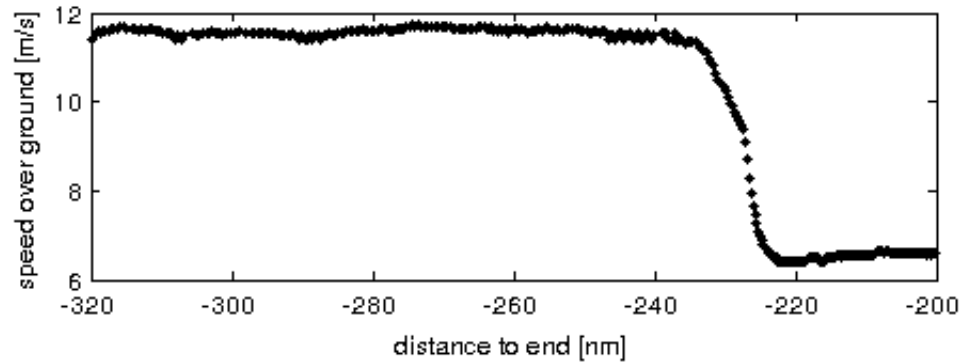
All AIS data have co-located

- Wind velocity
- Wave height, length, direction
- Tidal current velocity

Examples of AIS track data



Data that need to be filtered



Surface currents status

- Data are collected
- Prototype current model is constructed
- Assimilation method is devised

Now the case study must be started

Case study

Purpose:

Assess reliability limits of estimated surface currents from a statistical analysis.

E.g.: AIS data show speed variations of 0.1 m/s.

Is this a significant signal or smoothed noise?

A statistical analysis of the case study result will give an indication.

Thank you

Questions?