

Cluster meeting II ECCONET, WEATHER & EWENT

Transport & Mobility Leuven
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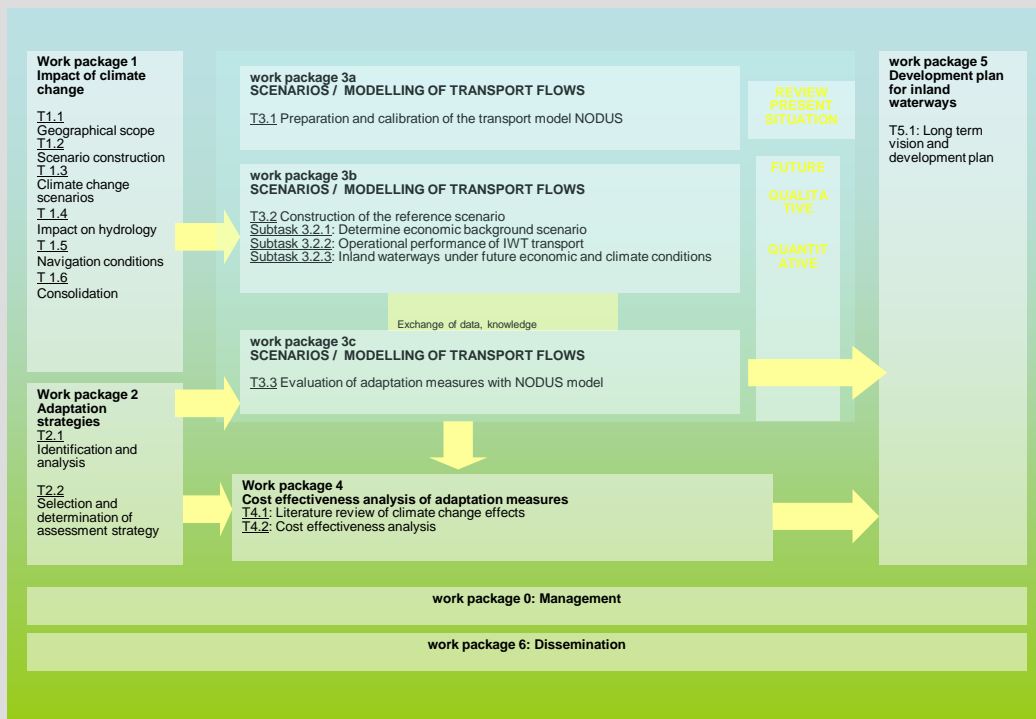
Outline presentation

- Project plan and objectives ECCONET
- Project status
- Methodological issues
 - Modelling
 - Adaptation measures
- Cooperation with EWENT & WEATHER

Project objectives



1. Provide a coherent **overview of the impacts of climate change on the inland waterway transport system**, the affected transport network and the sectors of the shipping industry as well as the shippers themselves.
2. Identification, analysis and **assessment of adaptation strategies for improved operation of inland waterway vessels** under changing climate, leading to targeted recommendations, policy guidelines and a development plan for the IWT mode
3. **Communicate the results of the project**, not only within the consortium and its associated network, but also to a wider range of stakeholders, industries, policy makers and the general public, in a way that contributes to a sustainable future for IWT

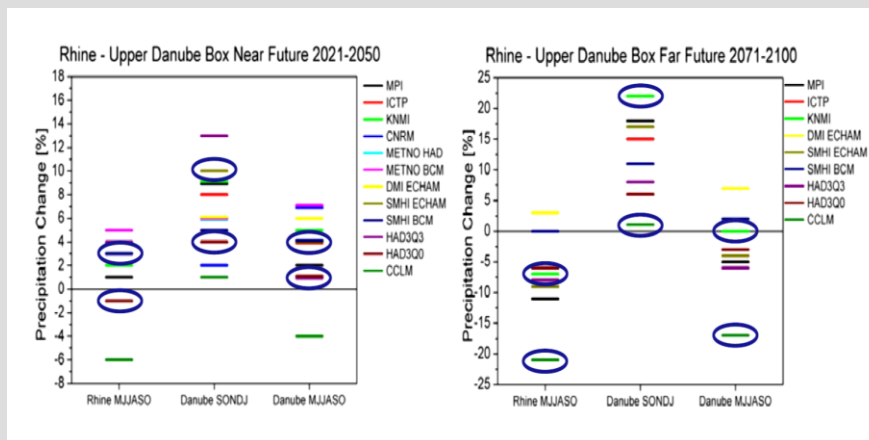


Methodology and modeling



	Time span	Important output variables	Complications
Climatological models	30 year-averages for example:1960-1990, 1991-2021, 2021-2050, 2040-2070, etc.	precipitation, temperature	Bias-prediction, regional climate scenarios, large set of model chains (ensembles), uncertainty
Hydrological modelling	Daily and even hourly variations for all modelled years (30 years)	water levels/water depths on different river stretches based on nature of river	Added uncertainty due to regional variance and anthropogenic factors. Large running time
Transport-economic modelling	Based on an OD-matrix for 1 year. Predictions should be based on averages or should be composed of different characteristic situations	Flow of goods by transport mode (inland waterways are 1 of the modes) Costs of transport (minimized by model)	Difficult to handle sub-annual information (for example seasonal variance) Uncertainty in OD matrix. Only a limited set of model runs is possible

Selected impact chains (1)



Selected impact chains (2)



Time frame	Scenario	Rhine	Danube
2021-2050	Low	A1B_HADCM3Q0_HADRM3Q0 (HAD3Q0)	A1B_HADCM3Q0_HADRM3Q0 (HAD3Q0)
	High	A1B_BCM_RCA (SMHI BCM).	A1B_EH5r3_RCA_25 (SMHI ECHAM)
2071-2100	Low	A1B_EH5r1_CCLM (CCLM)	A1B_EH5r1_CCLM (CCLM)
	High	A1B_EH5r3_RACMO (KNMI)	A1B_EH5r3_RACMO (KNMI)

Representative years



Water depth	2005 'reference'			Near future 'dry' scenario		
	Median	D5	D10	Median	D5	D10
1.6	0	0	0	0	4	24
1.8	0	20	36	5.5	55	74
2	14	61	86	28.5	79.5	121.5
2.4	133	192	221	135.5	203.5	234.5
2.6	182	260	273	216	259.5	307.5
3.25	301	334	344	324	365	365
3.55	328	351	352	344	365	365

Current agreement



- Selected dry and wet climate change impact chains used in climate modeling
- From hydrological results extraction of representative years
- D2 = 'dry' year expected each 2 year
D5 = 'dry' year expected each 5 years
D10 = 'dry' year expected each 10 years
- Economic model predicts transport flows for each 'water level situation'
- Distribution of water level occurrence determines impact
Total effect = x days * WL 1 + y days * WL 2 + ..
- Adaptation is measured in centimeters and influences transport flows positively
- Partners try to give adaptation in quantitative terms preferably
- Cost effectiveness of adaptation will be calculated next year

Fleet adaptation



A	Fleet units	B	Operation	C	Logistics
1	Lightweight structures	1	Continuous instead of daytime	1	Strategic alliances between IWT and railways
2	Adjustable tunnel	2	Implementation of coupling trains		
3	Side blisters	3	Small vessels instead of large ones		
4	Flat hulls (multiple screw push boats)				

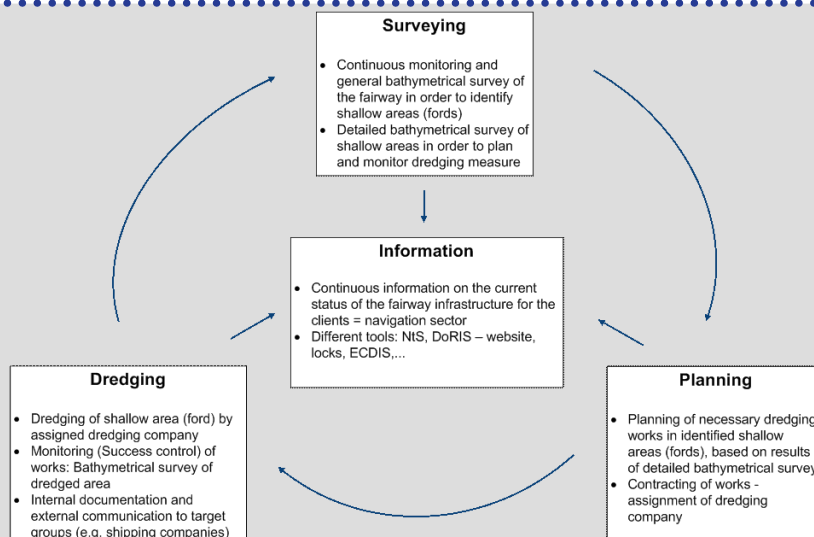
Adaptation measured in cm



More carrying capacity at reduced draught for x[cm] - corresponds to the same drop of water depth and unchanged carrying capacity

	savings [t]	immersion [v/cm]	water level drop [cm]										Compensation of carrying capacity [t]
			5	6	7	8	9	10	15	20	25	30	
Gustav Koenigs extended	45	6,1	31	37	43	45	45	45	45	45	45	45	45
Johann Welker extended	55	7,5	38	45	53	55	55	55	55	55	55	55	55
GMS 110	90	11,1	56	67	78	89	90	90	90	90	90	90	90
GMS 135	150	14,3	72	86	100	115	129	143	150	150	150	150	150
JOWI	200	21,1	105	127	148	169	190	200	200	200	200	200	200
Europe II Barge	70	8,0	40	48	56	64	70	70	70	70	70	70	70

Infrastructure adaptation



Seasonal prediction methods



- Improved prediction of water level situation (currently 3-5 days)
- Possibility of 1-3 months predictions and more was studied
- **Conclusion:** theoretically very appealing, also large interest from the sector..

Unfortunately:

- High R&D costs with a relatively low success rate for actual 'trustworthy method'
- Possible: extraction of trends in seasonal forecast...
- From our data: 2011 could have been as bad as 2003 for inland waterway transport, if the summer had not been that 'wet'.

Adaptation by industry



- **Survey method:** Very low response rate
 - 80 questionnaires were sent out, only 9 filled in. (+- 10 % response)
- We have the impression that the issue of climate change is currently not alive in the sector.
- Our results show that the impact of climate change should not be **overestimated**, the impact is relatively low, especially compared to economic variables
- Additionally very large time spans -> potential negative side-effects only really apparent for 2100

Link with EWENT & WEATHER (ECCONET DoW)



- The projects will support each other in the communication of results and findings via their own networks and tools.
- A joint workshop is planned when the first results of the weather scenarios, vulnerability aspects and possibilities of adaptation are available.
- Mutual contributions of the projects on their final conferences are foreseen.
- The possibility of planning a joint dissemination event has been kept open.
- Project coordinators will meet on a yearly basis to decide on the organization of common events, publication of results and on the exchange of information.

Realized with EWENT & WEATHER



- Regular communication with Pekka Leviakangas and Claus Doll, especially concerning dissemination activities
 - **TRA conference Athens 2012**: plans for joint workshop + papers submitted
 - **TRB conference Washington 2012**: joint workshop EWENT + WEATHER + ECCONET and papers submitted
 - **Joint issue in journal** coordinated by EWENT partner (Dr. Silas Michaelides)
- Via partners NEA and via Donau -> link between ECCONET, WEATHER and EWENT results
- ECCONET input and cooperation with WEATHER workshop in Rotterdam on 20th of May



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