Royal Netherlands
Meteorological Institute
Ministry of Infrastructure and the Environment

Dealing with extreme storm surges in The Netherlands

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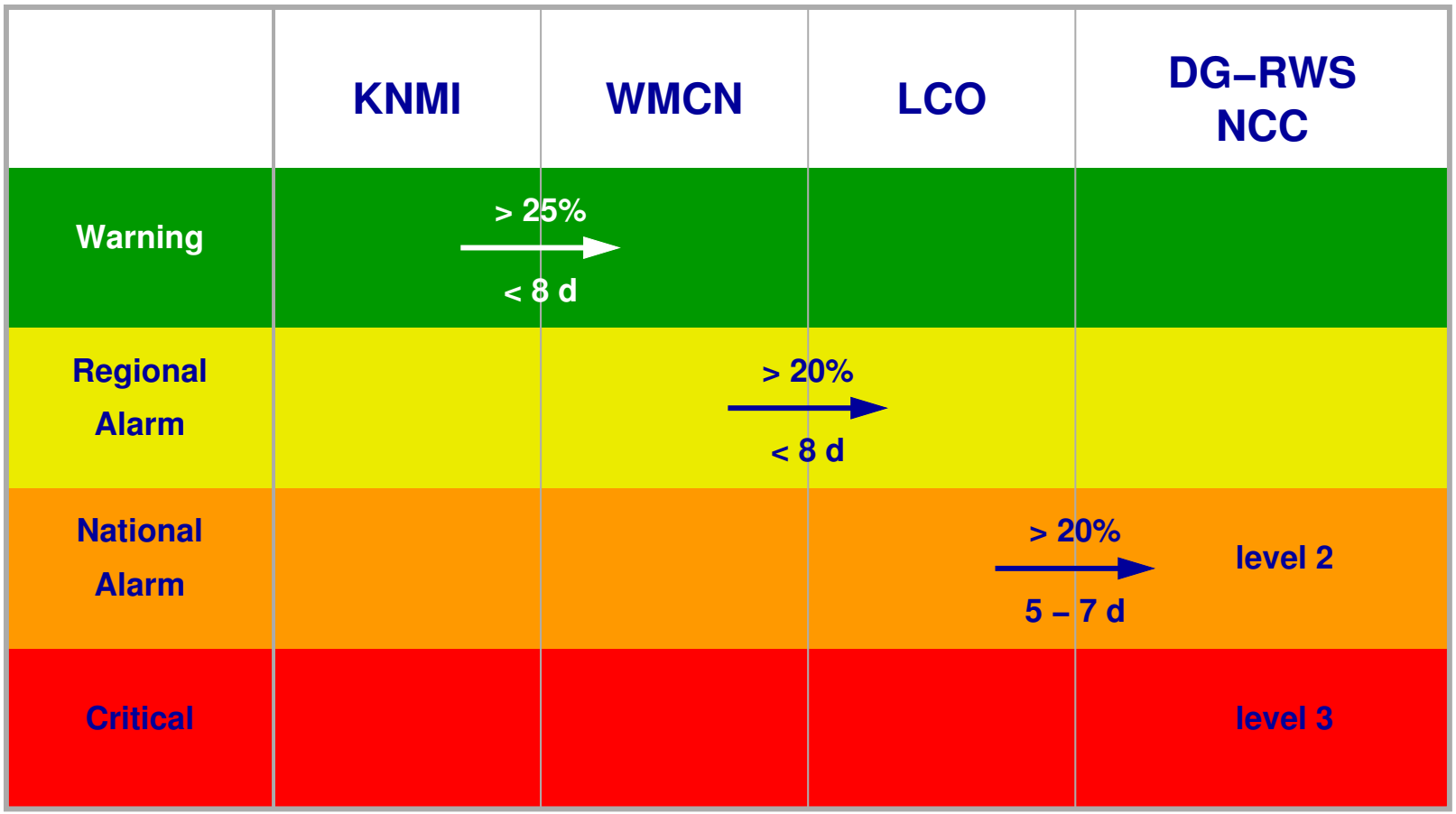
Motivation: The Netherlands

Organisation scheme



Conclusions

- Good communication between forecasters and decision makers is very important
- Use probability forecasts; train the users
- Friction between forecast models and decision makers' wishes
- Manage the media

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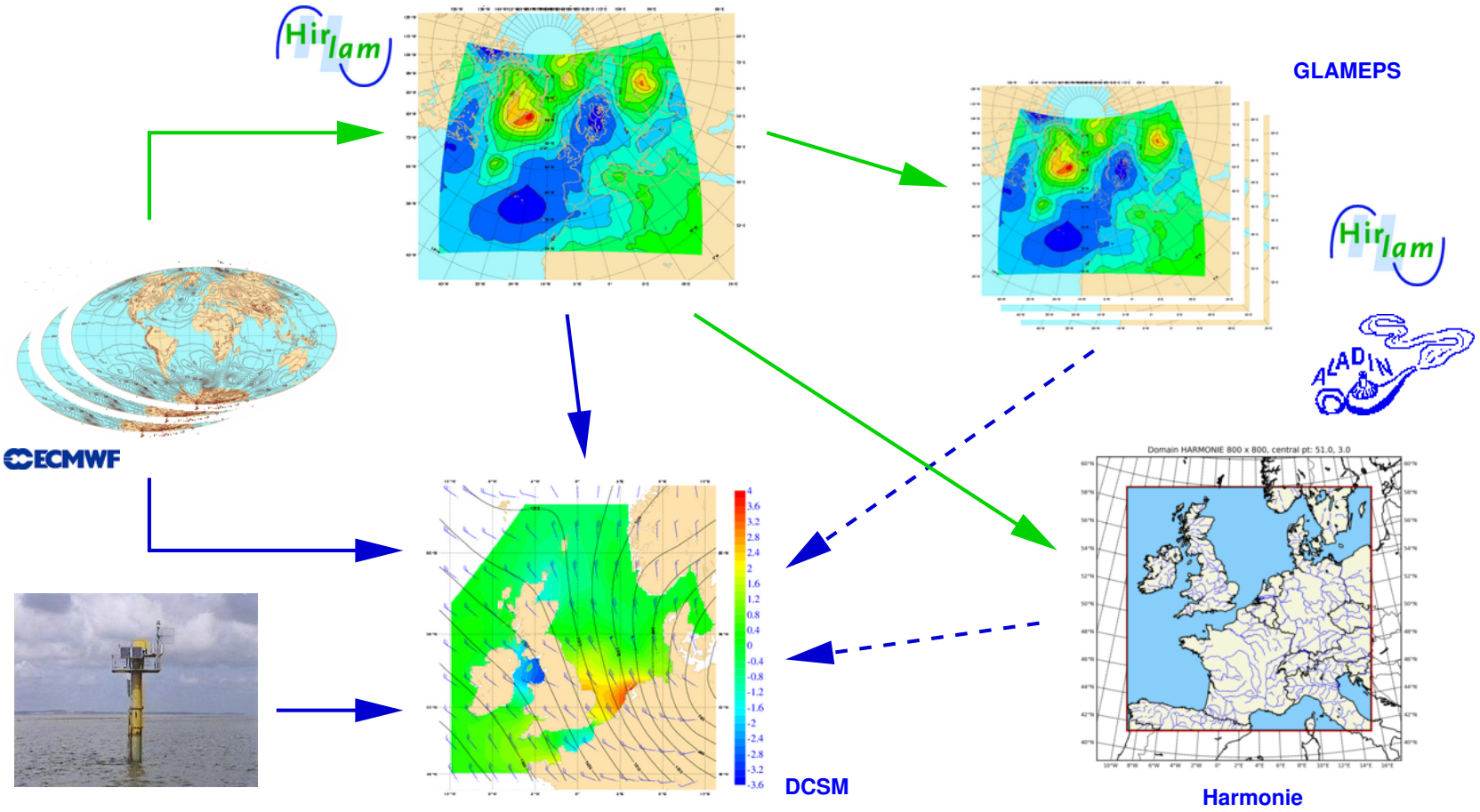
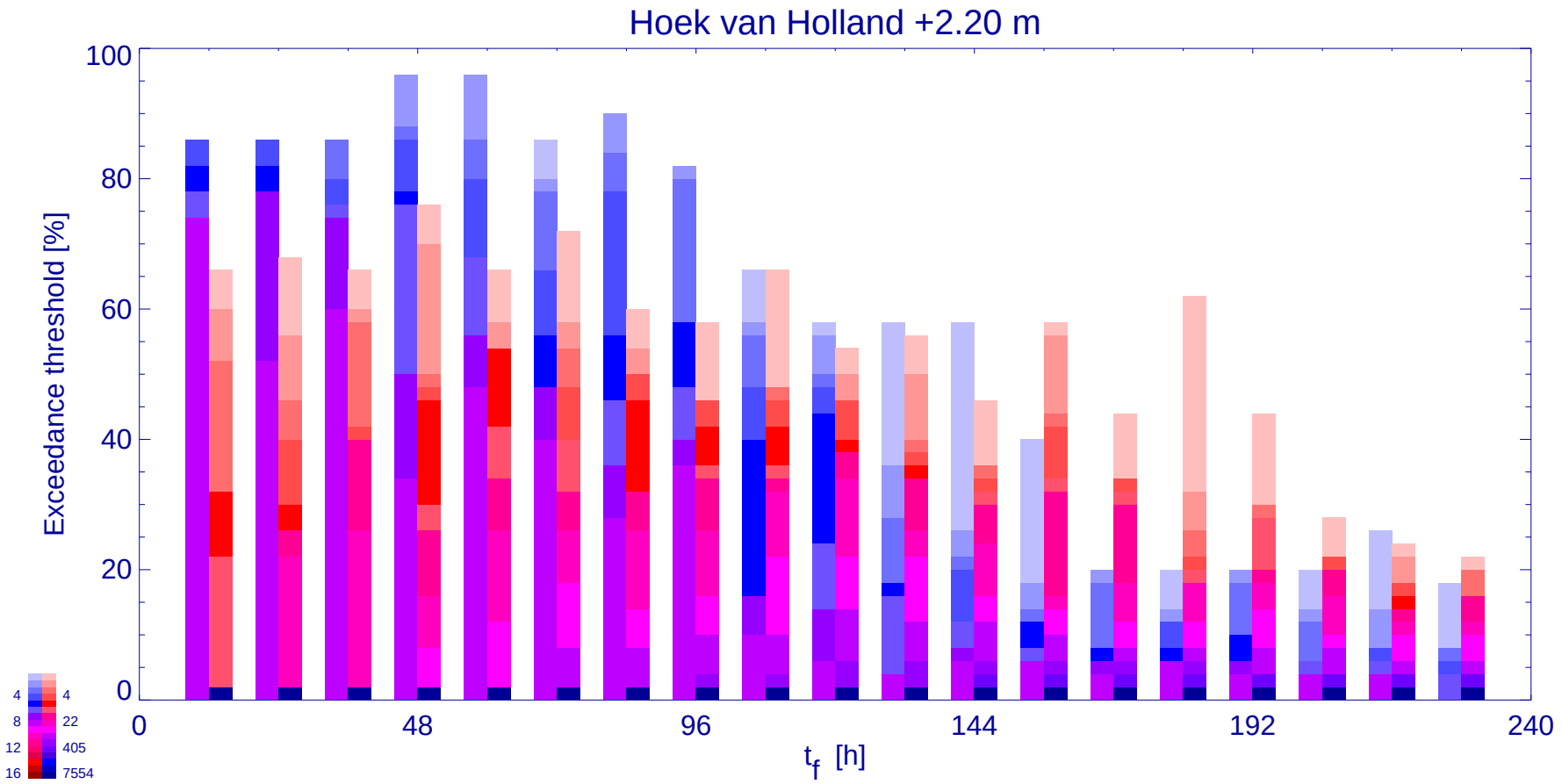
Significant levels (WMCN/LCO)

LCO	WMCN		HW per year	Hoek van Holland
Normal	Information	IP	10	180
	Pre-warning	VP	5	200
	Warning	WP	2	220
Regional Alarm	Regional Alarm	R AP	0.2	280
National Alarm	National Alarm	L AP	0.01 – 0.05	365
Critical	Critical	KRIT	0.001 – 0.005	435
	Design	MHW	0.0001 – 0.0005	510

Models


Hirlam
GLAMEPS
Hirlam
ALADIN
ECMWF
DCSM
Domain HARMONIE 800 x 800, central pt: 51.0, 3.0
Harmonie

Verification



Forecast to decision

- Prefer probability forecasts
- Decision makers do not think ‘probabilistically’
- Cost-loss: action if $C < P \times L$
- Communication between forecasters and decision makers

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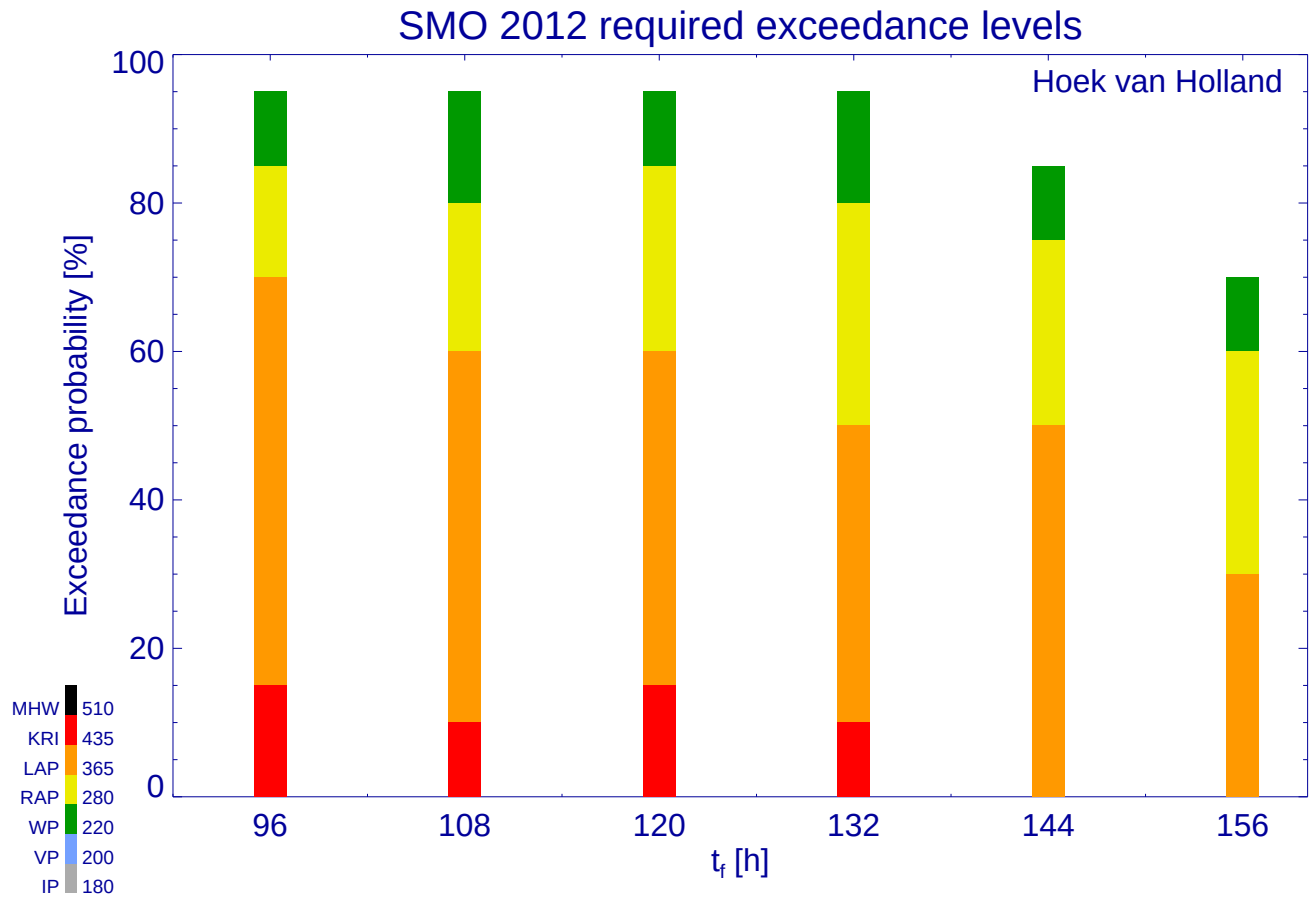
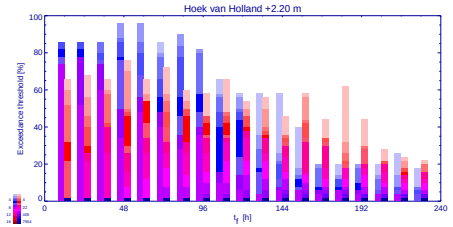
Exercise

- Test preparedness for extreme situations
- Involve all decision makers, providers and local authorities
- Threat is not a calamity (yet)
- Extreme situation should be unambiguous

Required probabilities





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Thank you