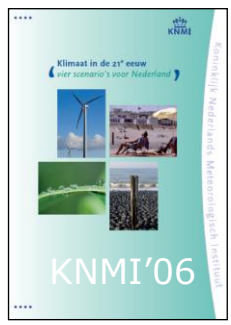
Koninklijk Nederlands Meteorologisch Instituut
Ministerie van Infrastructuur en Milieu

The KNMI'14 climate scenarios

Bart van den Hurk
KNMI

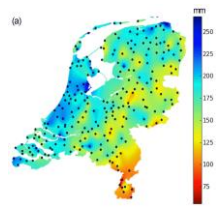
A continuing story

2006 2009 2011 2014

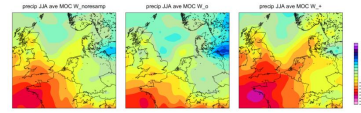


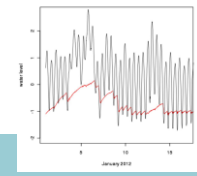
Why new scenarios?

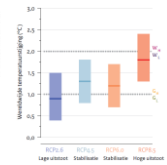
New knowledge
- IPCC report & new projections
- Local data/modelanalyses
- …



Many new questions
- More regional detail
- Different quantities
- Probabilities
- Manage 'surprises'
- …

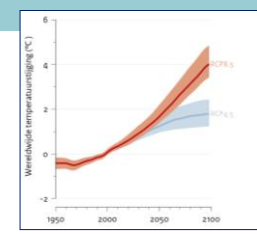






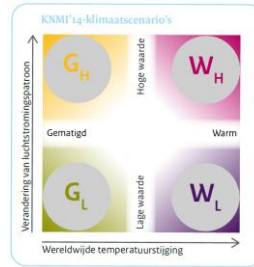
What's retained?

The temperature is still rising
- in spite of "hiatus" discussion



The structure of the old scenarios was useful
- Local deviations from global mean drivers

Many stakeholders are interested
- Water and non-water related



What's new?

KNMI'06
- A lot of statistical scaling of local rain/temperature quantities

KNMI'14
- Selection of representative time slices of (future) climate fields

KNMI'06
- Sea level rise based on many speculations from IPCC

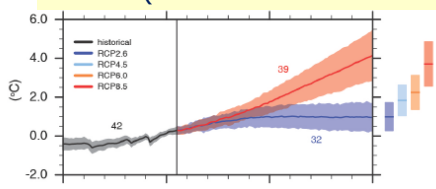
KNMI'14
- More physical processes explicitly considered

KNMI'06
- Only tables of changing characteristics

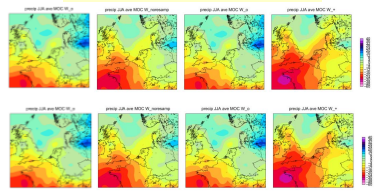
KNMI'14
- Examples of future weather to enhance interpretation

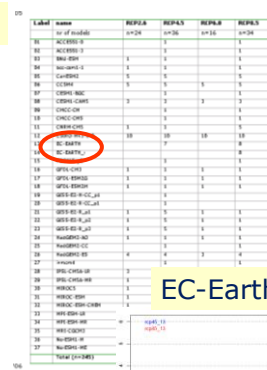
Downscaling with the new climate projections

CMIP5 (4 emission scenario's)

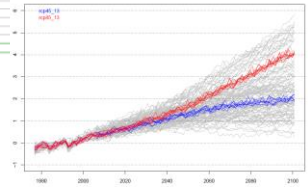


RACMO ensemble





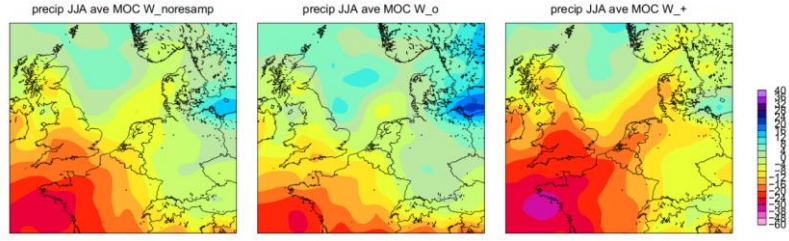
EC-Earth ensemble



Result: change of summer precipitation

Based on consistent ensembles of fields

- Allows derivation of spatial patterns

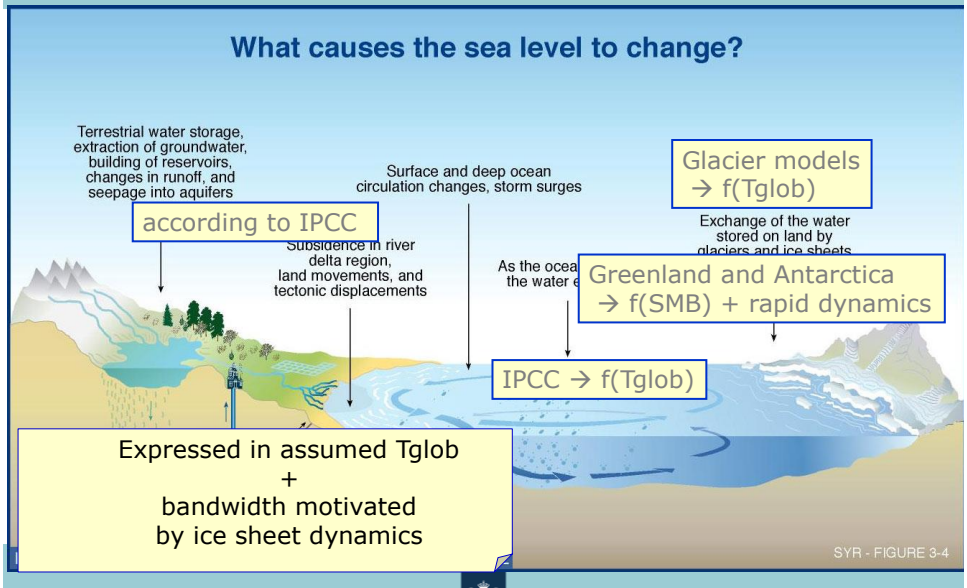


mean change "wet" scenario "dry" scenario

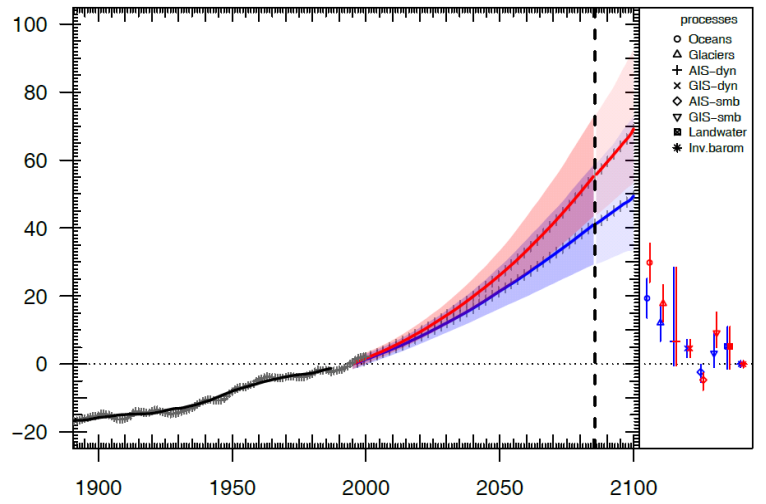
Important notions:

- Mean summer drying in KNMI'06 somewhat **too strong**
- Drying in Rhine basin **very different** from Netherlands area

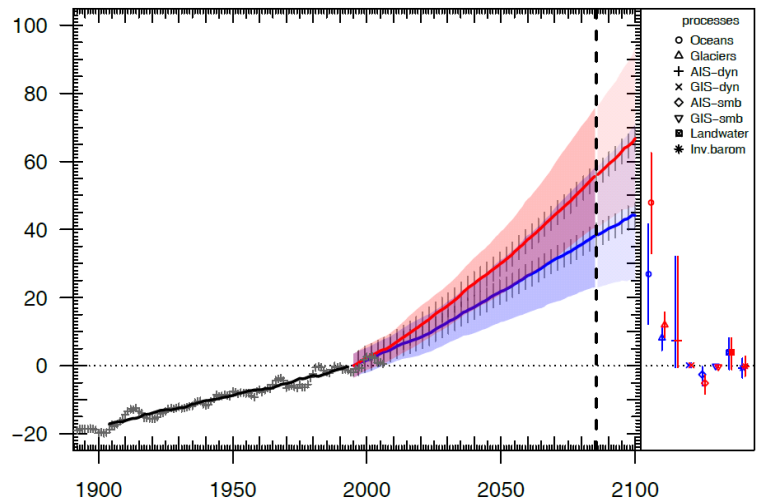
Scenarios of sea level rise



Global mean sea-level change



North Sea



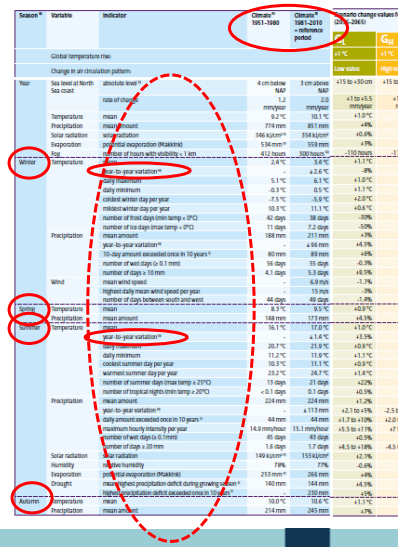
Overview of the scenario's

4 seasons

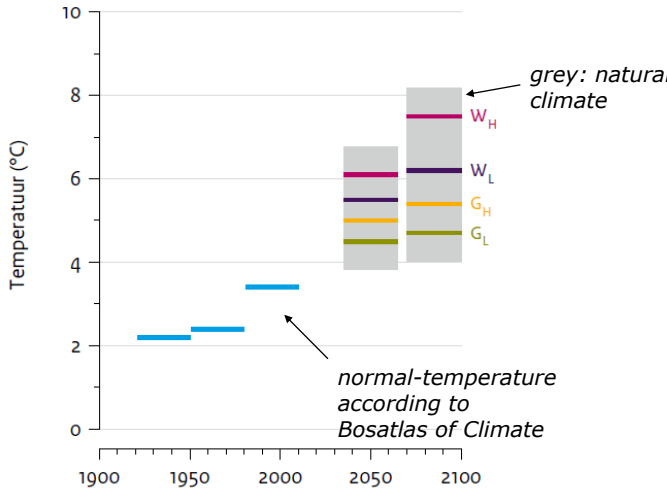
many variables

Normals & trends

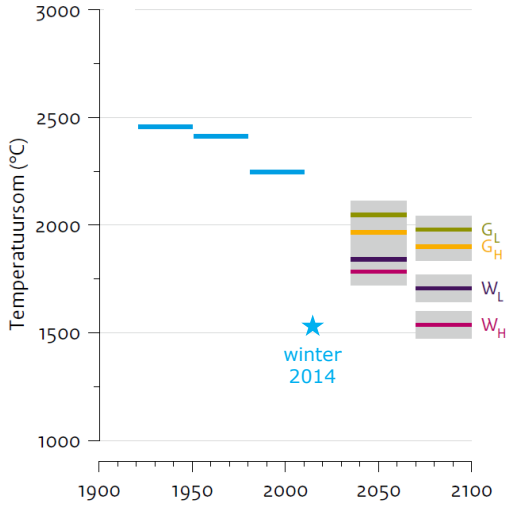
Natural variability:
- 30yr avg.
- yr2yr.



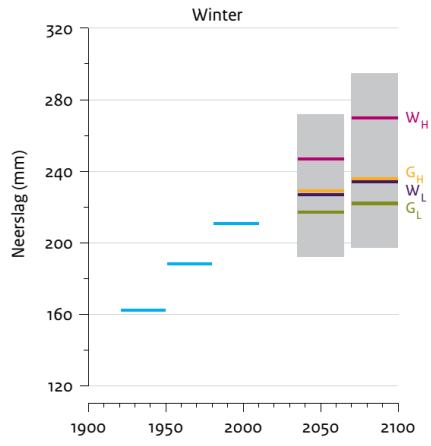
Winter temperature continues to rise



Temperature sum <17° declines

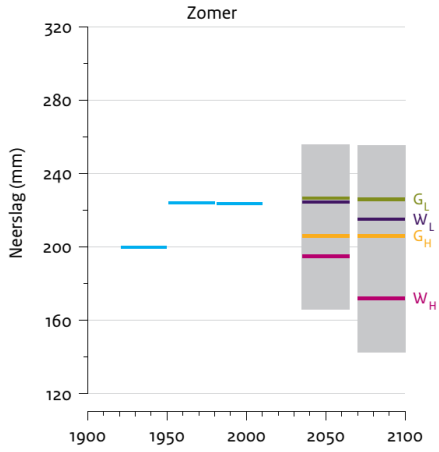


Winter precipitation increases



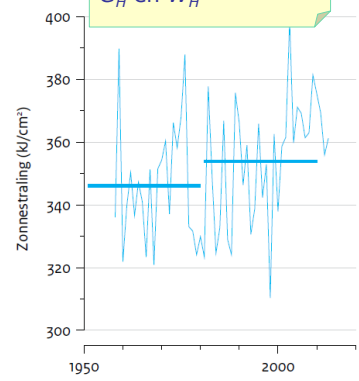
- More atmospheric moisture (~7% per degree warming) leads to increase
- Potentially reinforced ($_H$ t.o.v. $_L$) by stronger westerlies
- Extremes increase proportionally to mean changes

Change of summer precipitation uncertain

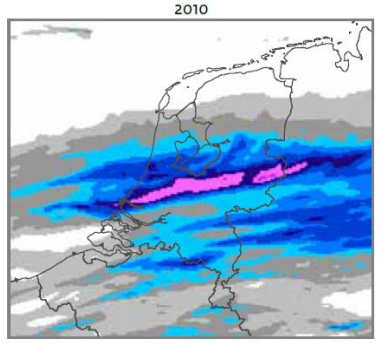


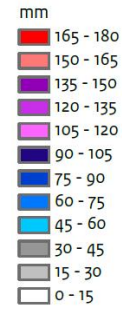
Three (ting
effects rtain:

Probability of summer drying increases in G_H en W_H

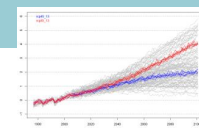


Future Weather analogues (+2°C example)

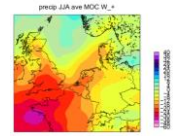


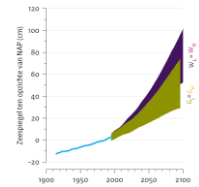


Conclusions



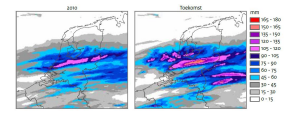
New set of scenarios
- Build on tradition
- New methodology → better physical interpretation

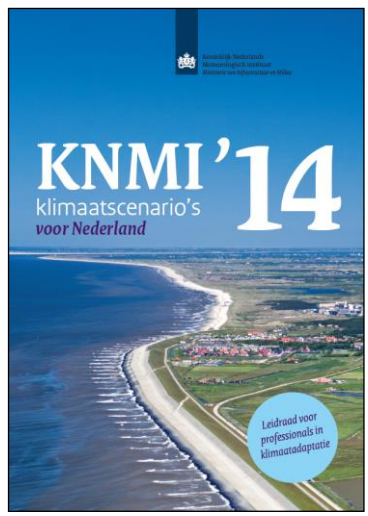




New findings
- Summer drying less pronounced
- Range of sea level rise slightly wider

New applications and developments
- More information on natural variability
- More attention for unprecedented events





in collaboration with:

Kennis voor Klimaat

SEVENTH FRAMEWORK PROGRAMME

www.klimaatscenarios.nl