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Significance of Climate Change Scenarios

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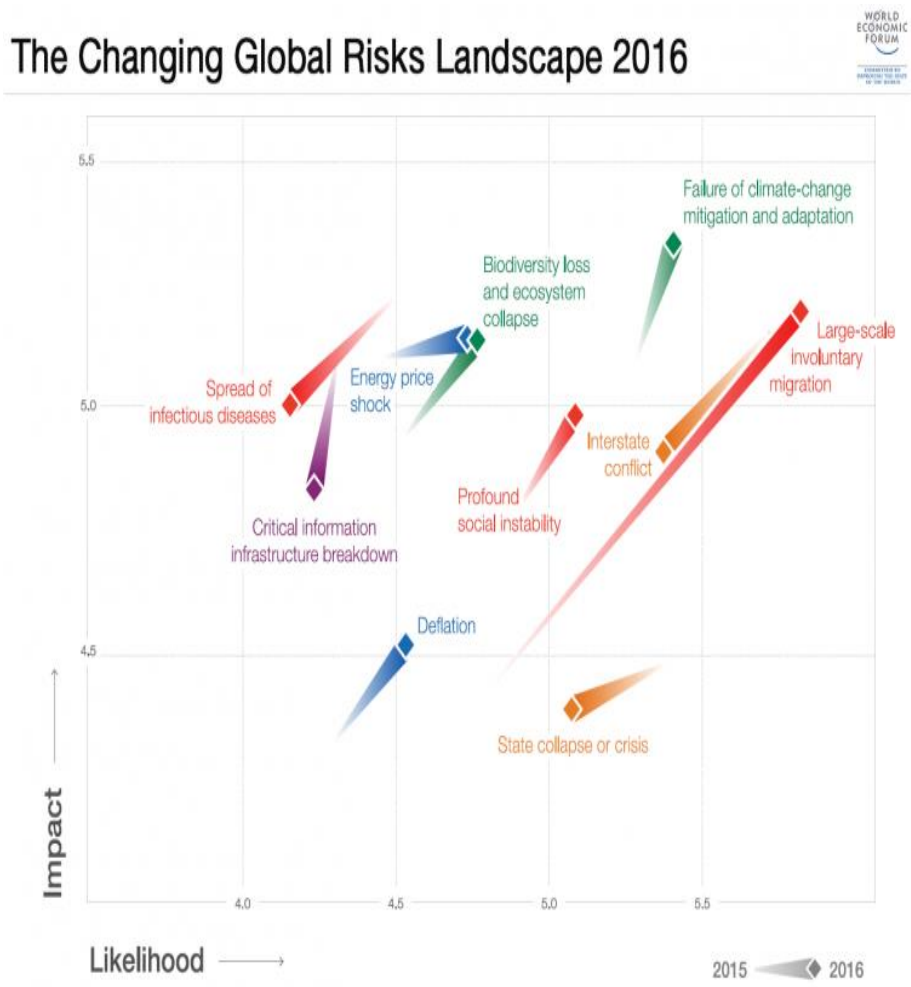
20 May 2016
Riga, Latvia

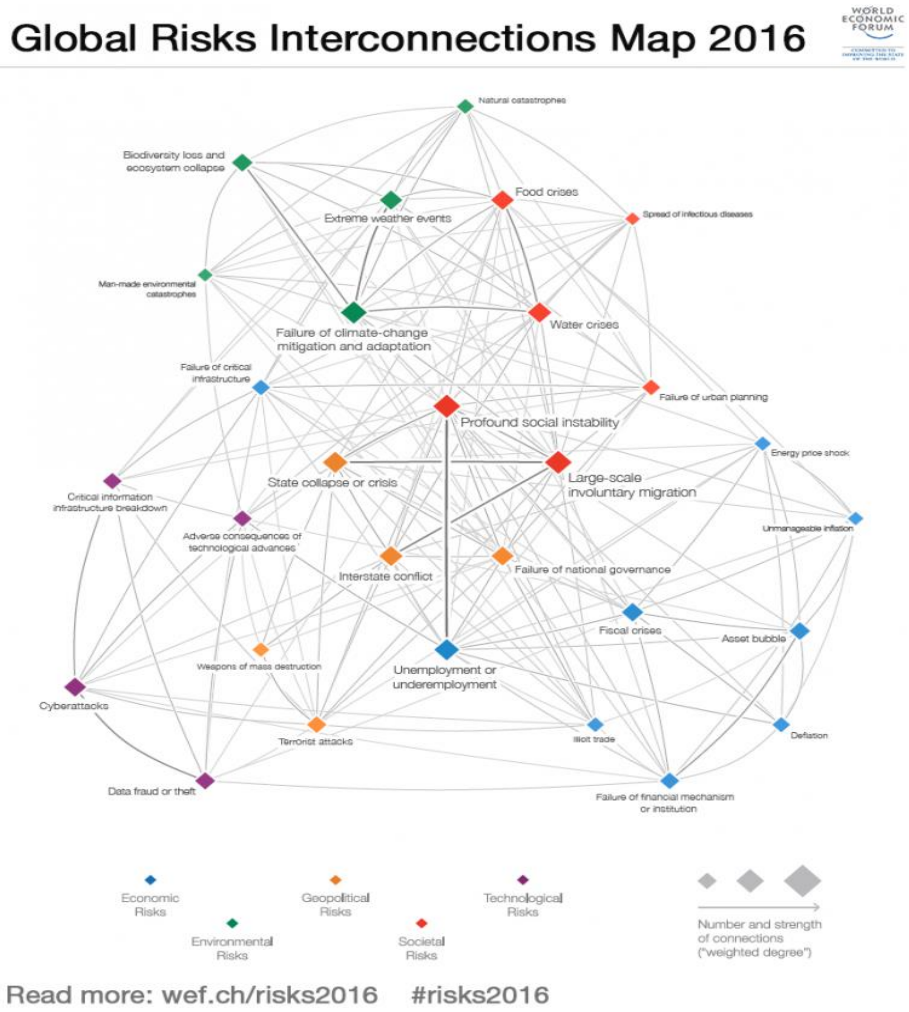
Climate change scenarios – step by step

1. Climate change risks – on global political agenda
2. Greenhouse effect and its` consequences – IPCC observations
3. Really do we need them?

Climate change related risks – on global political agenda I

<u>World Economic Forum Report on Global Risks 2016</u>: extreme weather events (on 2nd place), failure of CC mitigation adaptation (on 3rd place), major natural catastrophes (on 5th place)

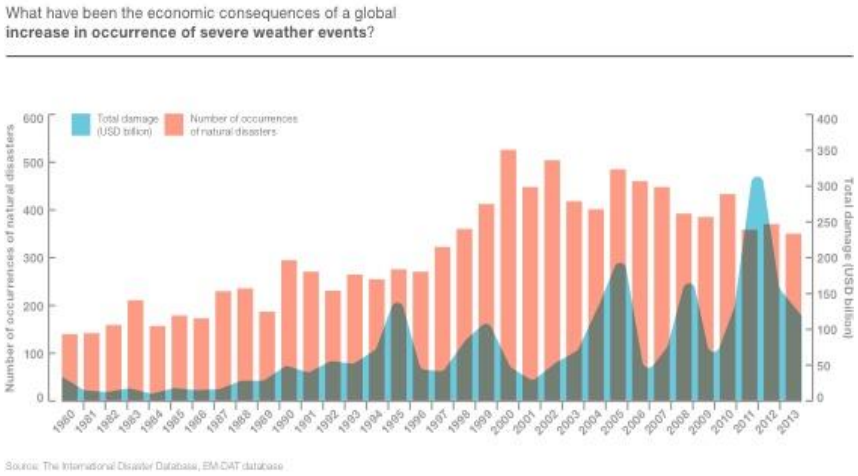




Climate change related risks – on global political agenda II

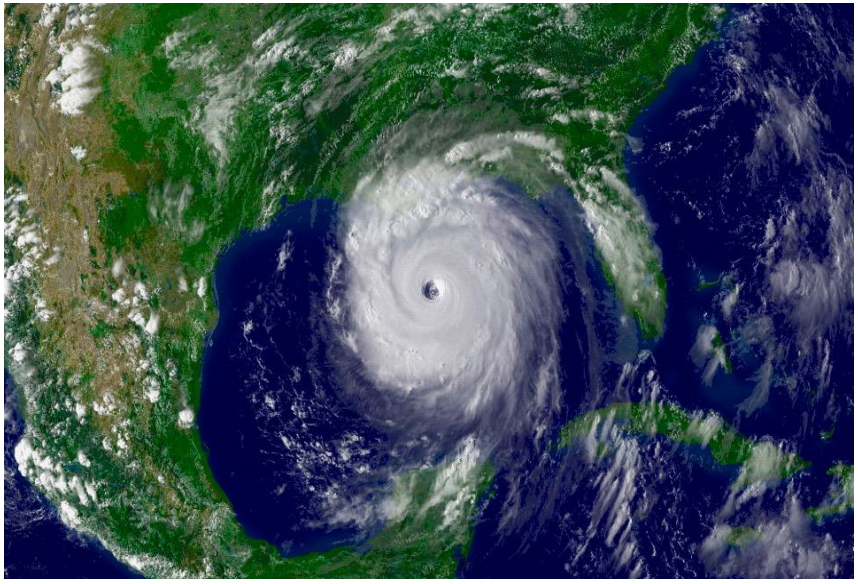
<u>UN Sendai Framework for Disaster Risk Reduction 2015-2030.</u>

Aim: *the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.*



<u>The Four Priorities for Action:</u>

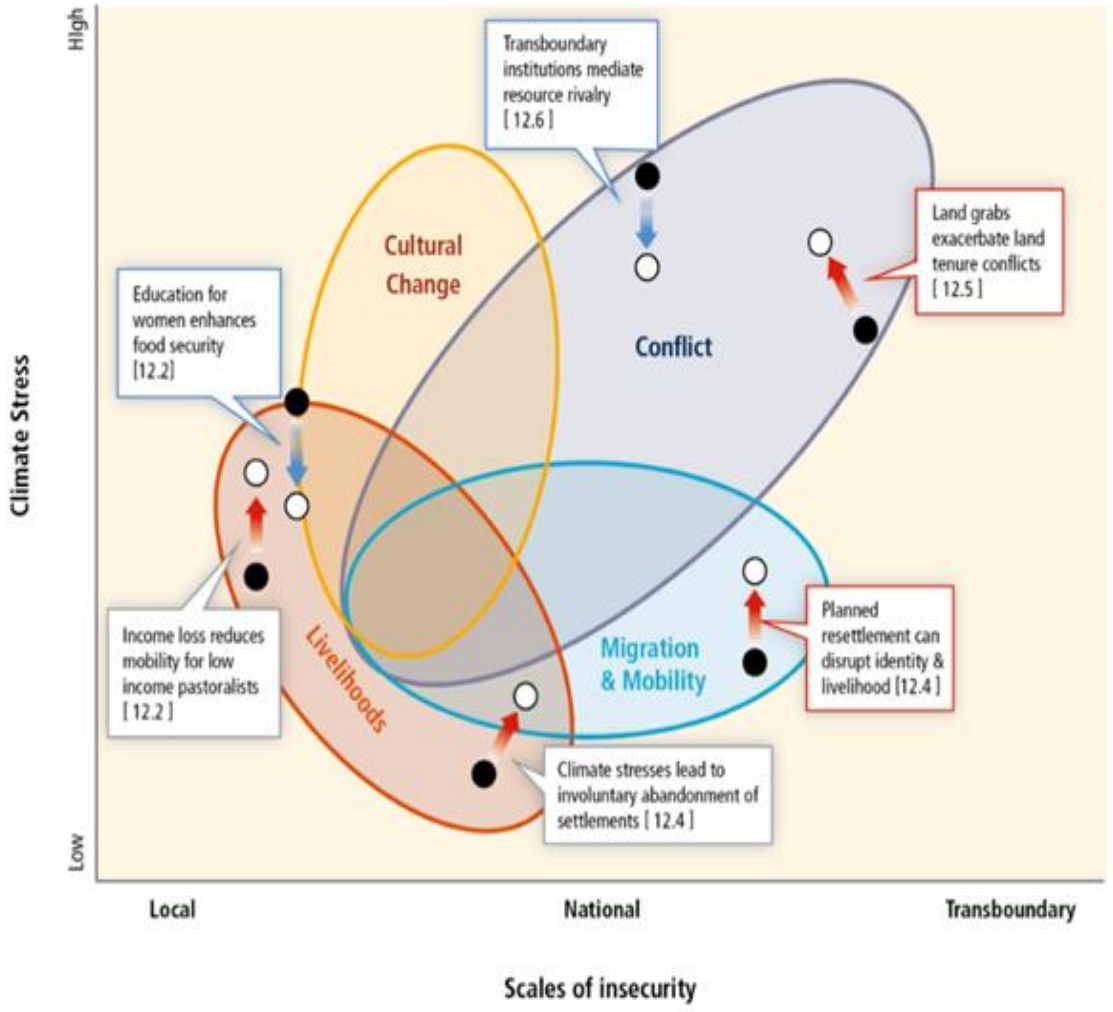
1. Understanding disaster risk
2. Strengthening disaster risk governance to manage disaster risk
3. Investing in disaster risk reduction for resilience
4. Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction



Climate change risks – on global political agenda III

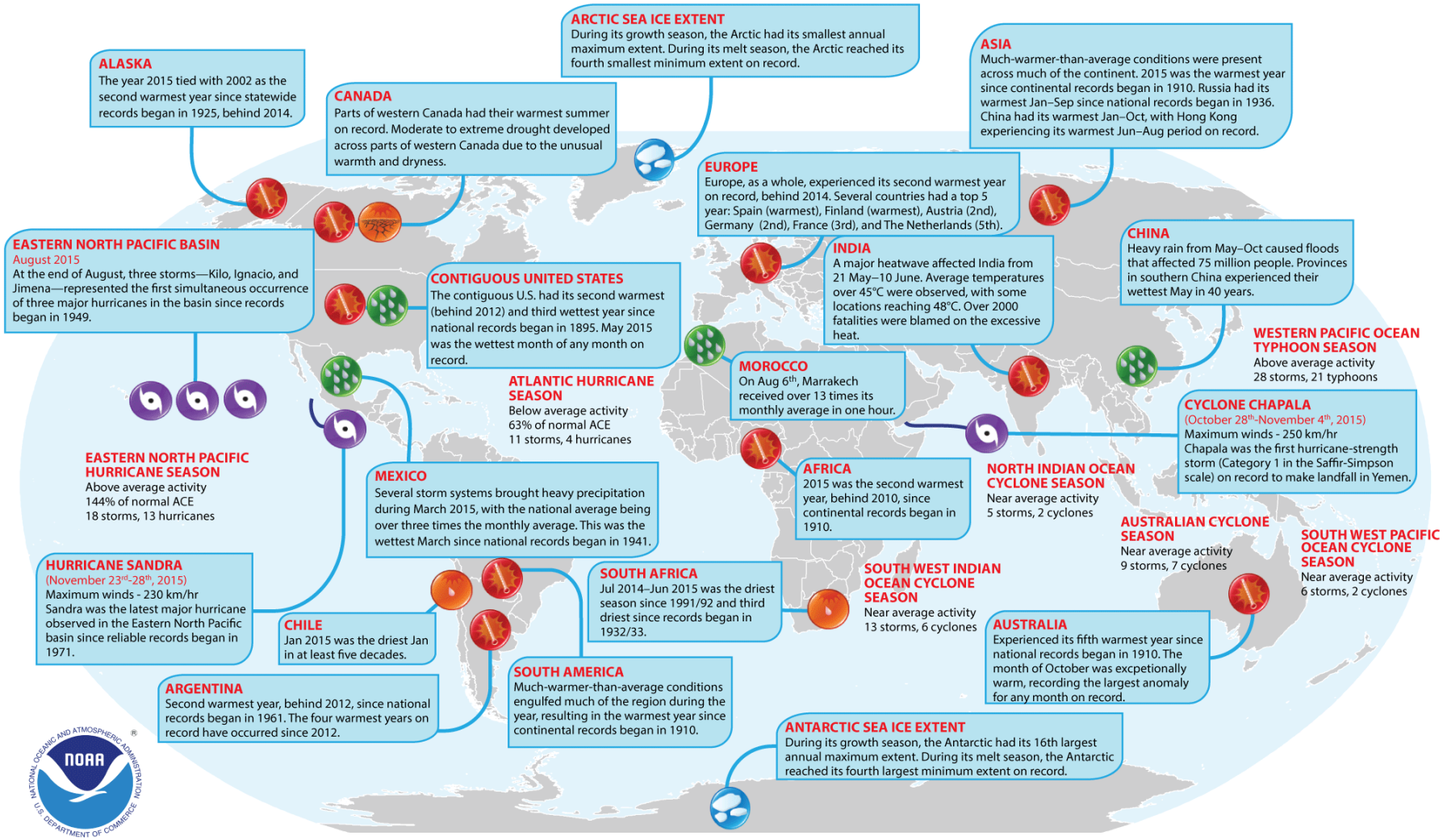
UN Sustainable Development Goals (SDGs): new agenda for post-2015 development:

- No poverty
- Zero hunger
- Good health and well-being
- Quality education
- Gender equality
- Clean water and sanitation
- Affordable and clean energy
- Decent work and economic growth
- Industry, innovation and infrastructure
- Reduced inequalities
- Sustainable cities and communities
- Responsible consumption and production
- **Climate action**
- Life below water
- Life and land
- Peace, justice and strong institutions
- Partnership for the goals



Climatic anomalies in the World in 2015

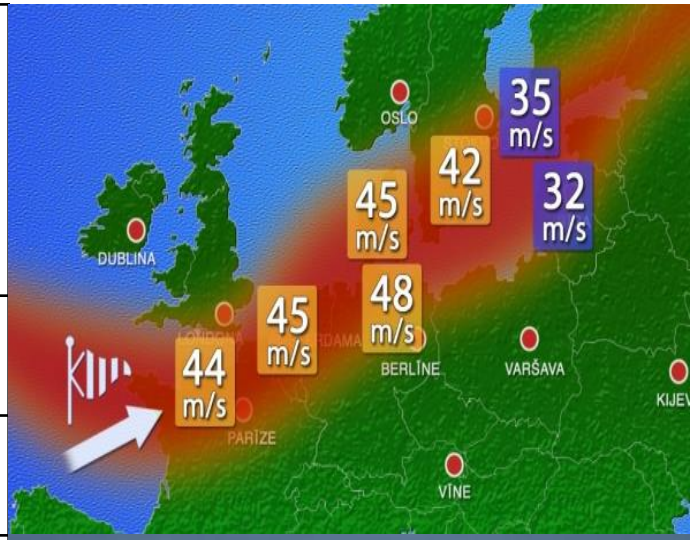
Selected Significant Climate Anomalies and Events in 2015



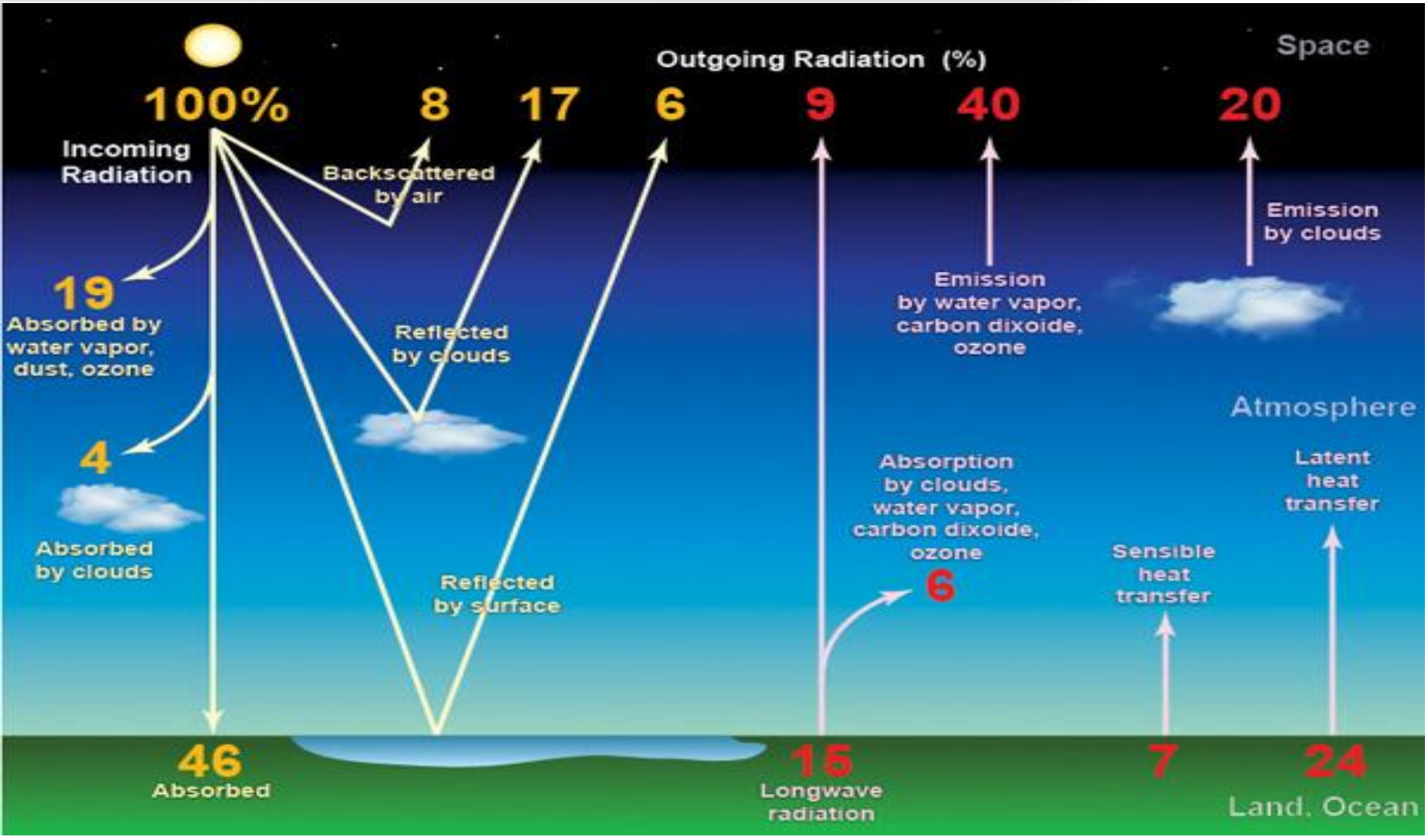
Please Note: Material provided in this map was compiled from NOAA's NCEI State of the Climate Reports and the WMO Provisional Status of the Climate in 2015.
For more information please visit: http://www.ncdc.noaa.gov/sotc

Granted aid from European Solidarity Fund after January cyclone Erwin (Gudrun) in 2005

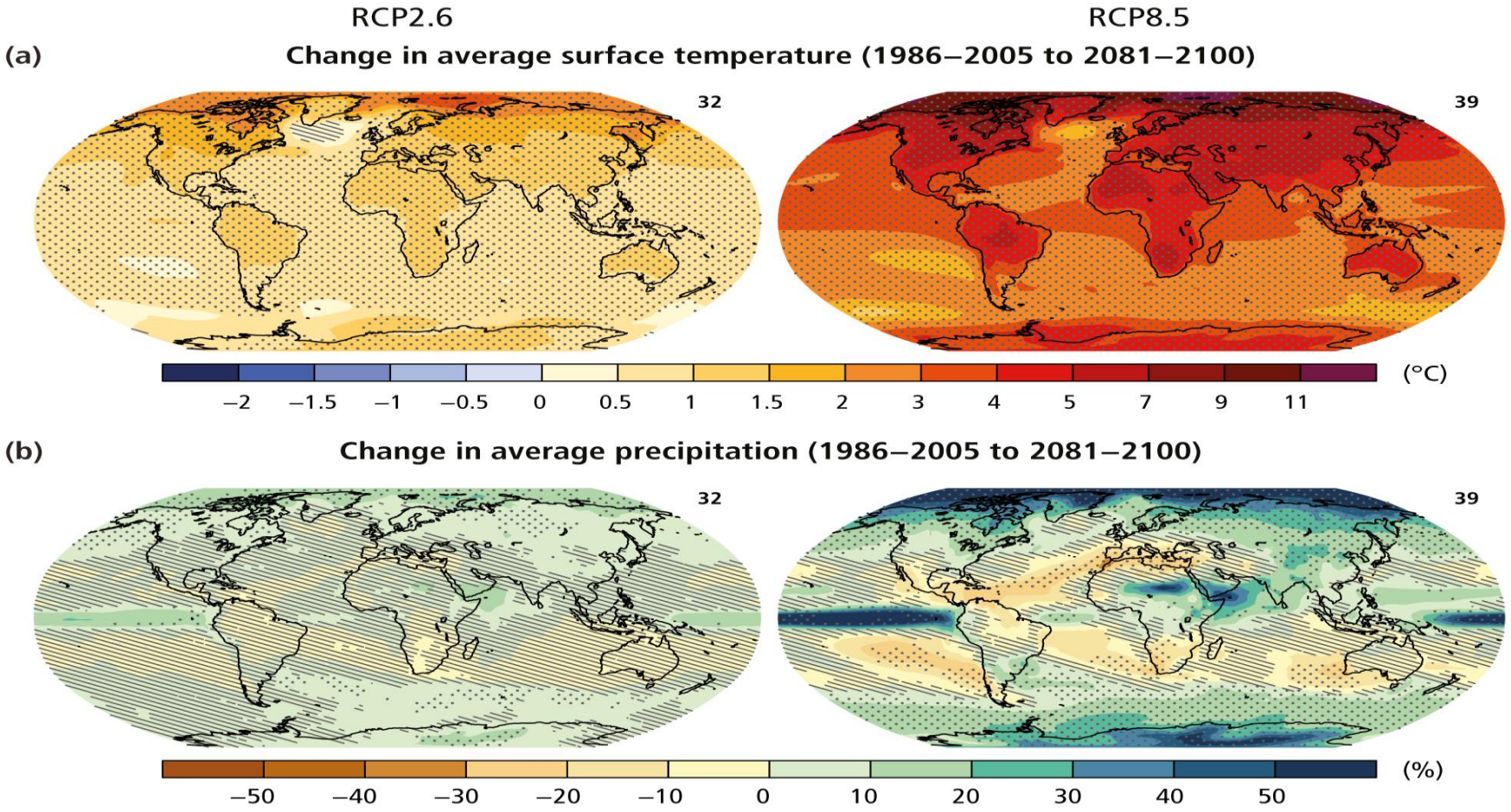
Recipient	Disaster	Category	Granted aid (million euro)
Slovakia	Storm	Huge disaster	5.668
Sweden	Storm	Huge disaster	81.725
Estonia	Storm	Huge disaster	1.290
Latvia	**Storm**	**Huge disaster**	**9.487**
Lithuania	Storm	Huge disaster	0.379
Total			98.548



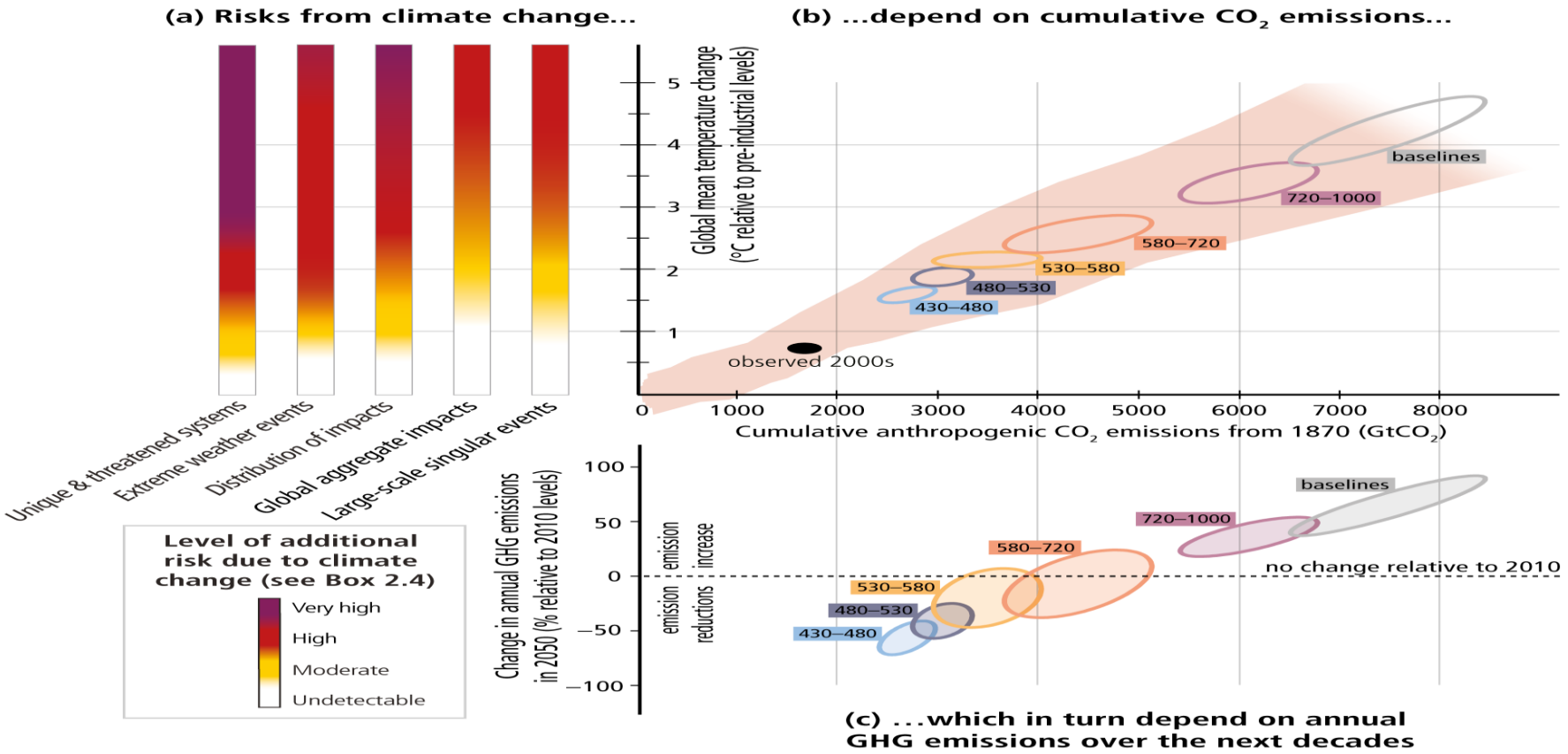
Greenhouse effect and net energy – how it works



IPCC: Climate Change 2014. Synthesis report



IPCC AR5:
Relationship between risks from climate change, temperature change, cumulative CO2 emissions



RCPs – Representative Concentration Pathways - are greenhouse gas (GHG) concentration (not emissions!) trajectories adopted by IPCC for its AR5 in 2014. They describe four possible climate futures, all of which are considered possible depending on how much greenhouse gases are emitted in the years to come. The four RCPs - RCP2.6, RCP4.5, RCP6, and RCP8.5 - are named after a possible range of radiative forcing values in the year 2100 relative to pre-industrial values (+2.6, +4.5, +6.0, and +8.5 W/m^2, respectively).

IPCC AR5: projections on global mean temperature and global mean sea level rise

Mean temperature	2046-2065	2081-2100
Scenario	Mean and *likely* range	Mean and *likely* range
RCP2.6	1.0 (0.4 to 1.6)	1.0 (0.3 to 1.7)
RCP4.5	1.4 (0.9 to 2.0)	1.8 (1.1 to 2.6)
RCP6.0	1.3 (0.8 to 1.8)	2.2 (1.4 to 3.1)
RCP8.5	2.0 (1.4 to 2.6)	3.7 (2.6 to 4.8)

Mean sea level rise	**2046-2065**	**2081-2100**
Scenario	Mean and likely range	Mean and likely range
RCP2.6	0.24 (0.17 to 0.32)	0.40 (0.26 to 0.55)
RCP4.5	0.26 (0.19 to 0.33)	0.47 (0.32 to 0.63)
RCP6.0	0.25 (0.18 to 0.32)	0.48 (0.33 to 0.63)
RCP8.5	0.30 (0.22 to 0.38)	0.63 (0.45 to 0.82)

Across all RCPs, global mean temperature is projected to rise by 0.3 to 4.8 °C by the late-21st century

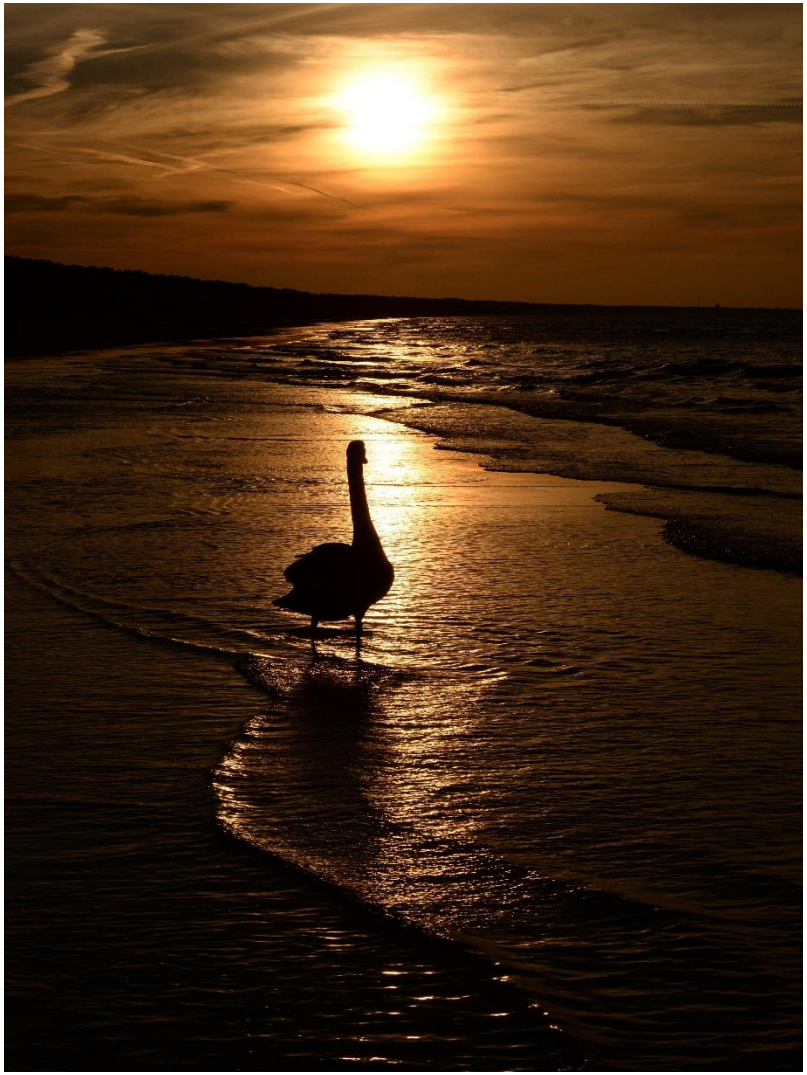
Across all RCPs, global mean sea level is projected to rise by 0.26 to 0.82 m by the late-21st century

Parameters	State Research Programme KALME (2006-2009)	Today
Data source	EU project PRUDENCE (2001-2004)- http://prudence.dmi.dk/	In SRP EVIDEnT: ENSEMBLES (2004-2009) - http://www.ensembles-eu.org/about/ , CORDEX (after ENSEMBLES)
IPCC scenarios	A2 (IPCC 2000) - describes a very heterogeneous / fragmented world, regionally oriented economic growth B2 (IPCC 2000) - describes a world in which the emphasis is on local solutions to economic, social and environmental sustainability, with continuously increasing global population	IPCC scenarios: RCP2.6, RCP4.5, RCP6.0, RCP8.5 Models: CanESM2, CNRM-CM5, GFDL-CM3, HadGEM2-ES, MIROC5, MPI-ESM-MR
Parameters	Temperature, precipitation, wind	Temperature, wind, precipitation, climate indices
Time periods	1961-1990 2071-2100	2011-2040 2041-2070 2071-2100

! Projections of climate change depend heavily upon on future human activity, number of people, density, future technological development as well as the future economic development !

So, why do we need future climate scenarios?

1. For survival
2. For security
3. For providing development (low-carbon, circular economy, etc.)
4. For welfare / well-being
5. To live in accordance with laws of Nature
6. To better explore the nature of climatic system



THANK YOU!

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