

Wisualising and Mobilising Action Defending the Global Commons

Climate change and biodiversity crisis: where do we stand and the way forward?

Muscat, Oman, September 18th, 2022

Juha Alatalo Environmental Science Center Qatar University



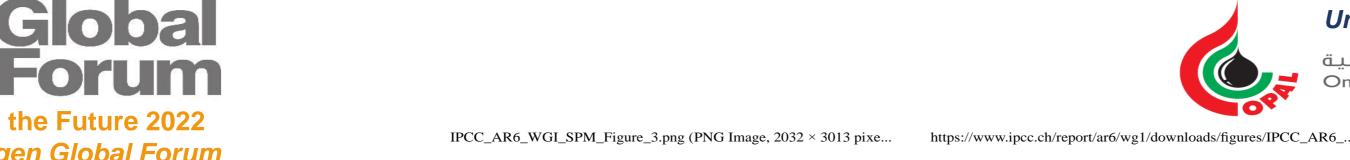




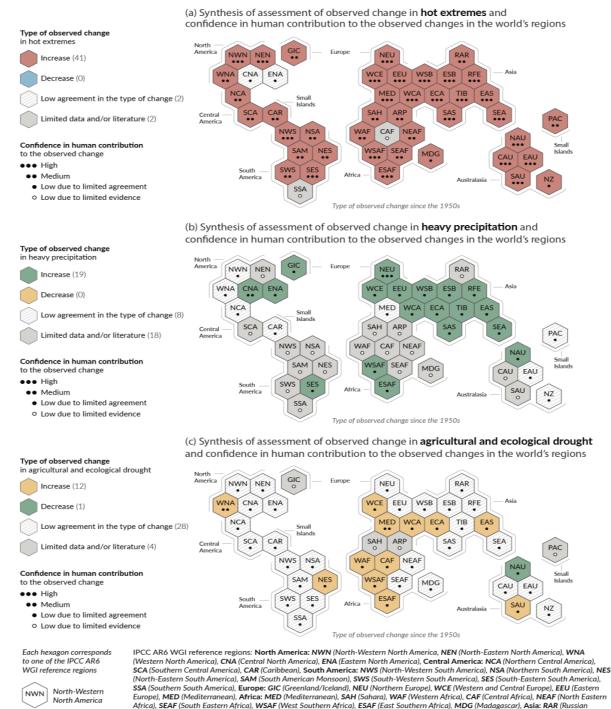
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Observed regional changes in hot extremes, rainfall, and drought



Climate change is already affecting every inhabited region across the globe, with human influence contributing to many observed changes in weather and climate extremes



Arctic), WSB (West Siberia), ESB (East Siberia), RFE (Russian Far East), WCA (West Central Asia), ECA (East Central Asia), TIB (Tibetan Plateau) EAS (East Asia), ARP (Arabian Peninsula), SAS (South Asia), SEA (South East Asia), Australasia: NAU (Northern Australia), CAU (Central Australia), EAU (Eastern Australia), SAU (Southern Australia), NZ (New Zealand), Small Islands: CAR (Caribbean), PAC (Pacific Small Islands)





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The frequency

of extreme

events will

increase



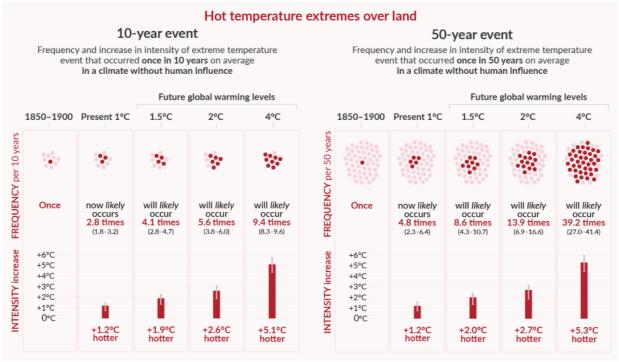
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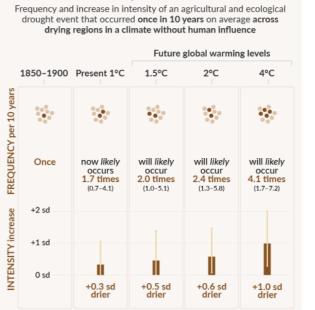
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Projected changes in extremes are larger in frequency and intensity with every additional increment of global warming



Heavy precipitation over land 10-year event Frequency and increase in intensity of heavy 1-day precipitation event that occurred once in 10 years on average in a climate without human influence							Agricultural & ecological droughts in drying region 10-year event Frequency and increase in intensity of an agricultural and ecologic drought event that occurred once in 10 years on average across drying regions in a climate without human influence											
18	350-1900	Present 1°C	1.5°C	2°C	4°C		1850-1900	Present 1°C	1.5°C	2°C	4°C							
						per 10 years			• • • •	*								
	Once	now likely occurs 1.3 times (1.2-1.4)	will likely occur 1.5 times (1.4-1.7)	will likely occur 1.7 times (1.6-2.0)	will likely occur 2.7 times (2.3-3.6)	FREQUENCY per 10 years	Once	now likely occurs 1.7 times (0.7-4.1)	will likely occur 2.0 times (1.0-5.1)	will likely occur 2.4 times (1.3-5.8)	will like occur 4.1 tim (1.7-7.2							
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	0%	+6.7% wetter	+10.5% wetter	+14.0% wetter	+30.2% wetter	INTER	0 sd	+0.3 sd drier	+0.5 sd drier	+0.6 sd drier	+1.0 s							









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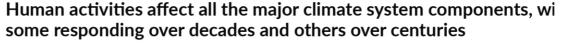
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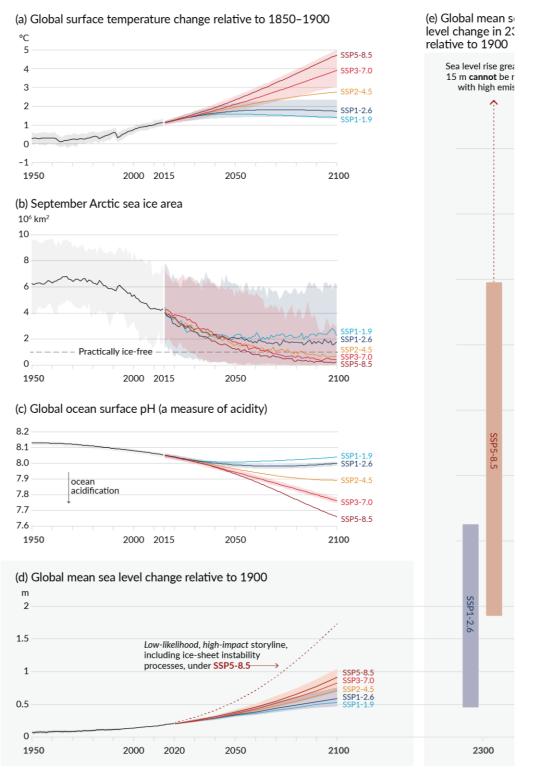
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Predicted changes in temperature, sea ice, ocean pH and sea level

Note: Sea may rise more than 7 meters in the future (2300 vs 1900)

Future of coastal cities?





WATER AND HUMANITY

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Key West (Florida) sport fishing in 1950's



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HUMANITY







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Bycatch











Decline in Biodiversity



- Between 1989 and 2016, the abundance of flying insects declined by over 75% in Germany.
- Worldwide, an average 68% drop in mammal, bird, fish, reptile, and amphibian populations since 1970
- The decline is linked to human activities and climate change
- 75% of crops depend on pollinators!

 Not only biodiversity – nature provides ecosystem services on large scale

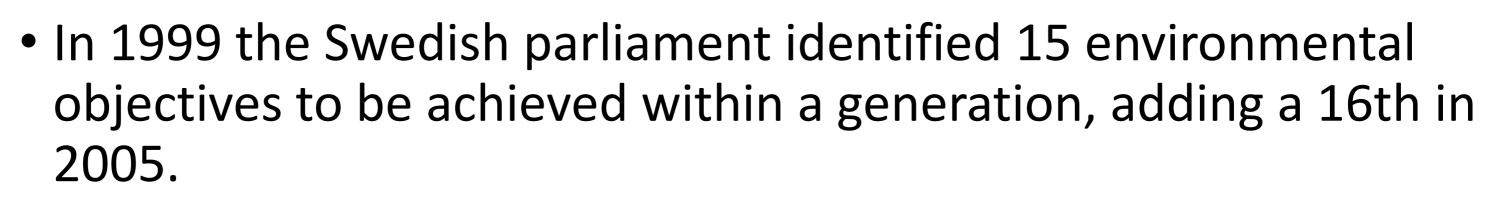






Sweden's Environmental objectives: A complete failure





- The end date for reaching the objectives (one generation) was set to 2020.
- During the follow-up in 2020: 15 (!) out of the 16 environmental objectives had not been reached.
- Reaction from Swedish government(s)?







Other Swedish Examples



- Agriculture and Forestry have among the highest potential to mitigate climate change and support biodiversity
- Swedish policy:
 - Sweden actively lobbies to include Forest biomass as a green and sustainable energy source – resulting in immediate increases in greenhouse gas emissions.
 - Sweden actively lobbies to weaken the role of the forest industry to support biodiversity and to enable the continuation of large-scale clear cuts.
 - Swedish government is actively instructing government agencies not to follow the ECs directive on water policy (2000/60/EC).



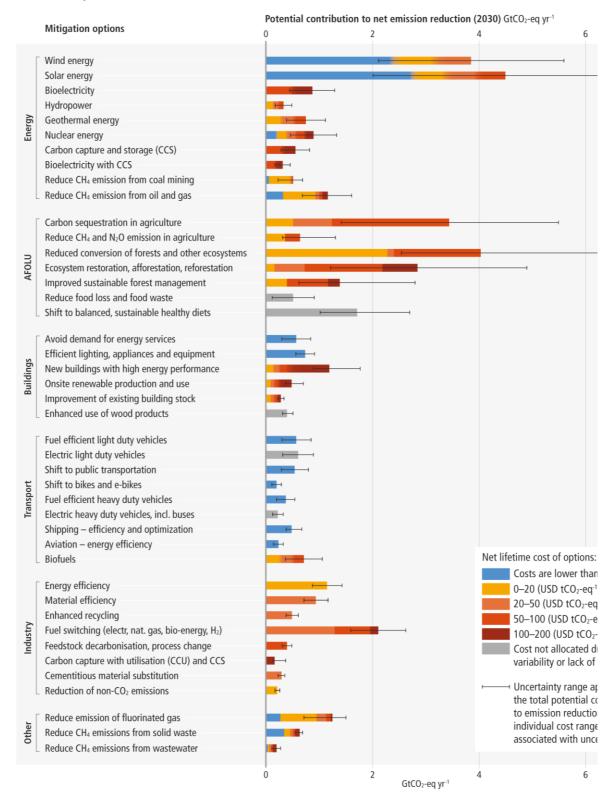


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Ways forward

Potential to reduce emissions and relative costs

Many options available now in all sectors are estimated to offer substantial potential to re net emissions by 2030. Relative potentials and costs will vary across countries and in the lo term compared to 2030.









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> Synergies between Sustainable

mitigation and development Goals



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Mitigation options have synergies with many Sustainable Development Goals, but some options can also have trade-offs. The synergies and trade-offs vary dependent on context and scale.

	Sectoral and system mitigation options	1	2	3	ith S	5	6	7	8	9	10	11	12	14	15	16	17	Chapter so
			2	3	*	,	0	,	0	9	10	"	12	14	13	10	17	
	Wind energy	+	٠	+			+	+	+	+		+	٠	•	٠			Sections 6.4.2,
Energy systems	Solar energy	+	٠	+			٠	+	+	+		+	٠	_	٠			Sections 6.4.2,
yste	Bioenergy	•	≗	•			≗	≗	+	+		+	+	≗	╚			Sections 6.4.2,
gy s	Hydropower	_	٠	+			+	+						٠	٠			Section 6.4.2
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ш	Nuclear power			•			Ξ	٠	#	+			8	٠	٠			Section 6.4.2, F
	Carbon capture and storage (CCS)			+			-		+	+			٠					Section 6.4.2, 6
n ()	Carbon sequestration in agriculture ¹	+	+	٠			+		+				٠	+	+	+		Sections 7.3, 7.
Agriculture, Forestry and Other Land Use (AFOLU)	Reduce CH ₄ and N ₂ O emission in agriculture			+									+	+	+			Section 7.4
rest (Al	Reduced conversion of forests and other ecosystems ²	•	_	+			+		٠			٠		+	+	٠		Section 7.4
, Fo Use	Ecosystem restoration, reforestation, afforestation	+	•	+			•		_			+		+	+			Section 7.4
ure	Improved sustainable forest management	+		+			+	•	+	+		•		+	+			Section 7.4
r E	Reduce food loss and food waste	+	+	+			+	+			+	+	+	+	+	+		Section 7.5
the St	Shift to balanced, sustainable healthy diets	•	+	+			+	+		•	+	+	+	+	+			Section 7.4
40	Renewables supply ³	•	٠	٠			٠	٠	+	+				٠	٠			Section 7.6
	Urban land use and spatial planning	+		+	+	+	+	+	+	+	o	+	ò	ò	ò	+		Sections 8.2, 8.
Urban systems	Electrification of the urban energy system	+	6	+	+	+	+	+	+	+	+	+	6	+	6	+		Sections 8.2, 8
yste	District heating and cooling networks	+	Ε	+	_	_	_	+	+	+	_	+	+	_	+	+		Sections 8.2, 8
an s	Urban green and blue infrastructure	+	+	+	+		+	+	+	+	ū	+	+	+	+	+		Sections 8.2, 8
Jrb	Waste prevention, minimization and management	+	+	ī			+		•	+	Ξ	+	ī	+	+	+		Sections 8.2, 8
_	Integrating sectors, strategies and innovations	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Sections 8.2, 8
	Demand-side management	+	+	+			+	+	٠	٠	+	+	+					Section 9.8, Ta
	Highly energy efficient building envelope		+	٠	+		+	+	٠	٠	٠	+	+			+	_	Section 9.8, Ta
S	Efficient heating, ventilation and air conditioning (HVAC)	•	+	+			+	+	٠	٠	٠	+	+					Section 9.8, Ta
Buildings	Efficient appliances	•	+	+	+	+	+	+	٠	-	٠	+	٠		+			Section 9.8, Ta
plin	Building design and performance	+	+	+			+	+	٠	_	+	+	+		+	+		Section 9.8, Ta
æ	On-site and nearby production and use of renewables		٠	+	+	+	٠	٠	٠	٠	٠	+	+		+	+	+	Section 9.8, Ta
	Change in construction methods and circular economy			+				+	٠	+		+	+				+	Sections 9.4, 9
	Change in construction materials			٠			٠	+	٠	+		+	+		-		+	Section 9.4
ţ	Fuel efficiency – light duty vehicle	+		+				+	+			+			+			Sections 10.3,
	Electric light duty vehicles			٠				٠		+	٠	+	×					Sections 10.3,
	Shift to public transport	+		+	+	+		+	+	•	+	+	+					Sections 10.2,
	Shift to bikes, ebikes and non motorized transport	+		ī	+	+		+	+	+	+	+	+		+			Sections 10.2,
odsı	Fuel efficiency – heavy duty vehicle	+		+	_	_		+	Ŧ	_	Ξ	_	_		+			Sections 10.3,
Transport	Fuel shift (including electricity) – heavy duty vehicle	_		+				+	-	+			ò		_			Sections 10.3,
	Shipping efficiency, logistics optimization, new fuels							+	-	+			_					Sections 10.6,
	Aviation – energy efficiency, new fuels							-	ä	_								Sections 10.5,
	Biofuels		٠	٠				=		=		+		٠	·			Sections 10.3,
	Energy efficiency			+						_								Section 11.5.3
>	Material efficiency and demand reduction						į.	_		+			+					Section 11.5.3 Section 11.5.3
Industry	Circular material flows								100			-	=	-	pro-		+	
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_	CCS and carbon capture and utilisation (CCU)	-	-	•		-	-	÷	+	+		+			_			Sections 11.5.3 Section 11.5.3
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ype of Syn	relations: Related Sustainable Deve ergies 1 No poverty	elopme	nt G	oal) Re											¹ Soil carbon n in cropland a

Both synergies and trade-offs⁴

2 Zero hunger 3 Good health and wellbeing

10 Reduced inequalities 11 Sustainable cities and communities

■ 12 Responsible consumption and production





Ways forward



- Reduce greenhouse gas emissions: focus on areas with synergies
- "Mapping" and protecting ecosystem services
- Reduce human pressure on biodiversity on land and oceans: large regions in even densely populated countries are "rewilding" as natural vegetation, and wild animals can exploit the decreased human pressure on rural areas.
- Reduce toxic pollutants to support biodiversity, human health, and clean water







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WWF: The Living Planet Report 2022



