A Topography of Climate Change Research - Results

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AR3

21716

AR4

38750

AR5

134413

AR6

201606

Results 1

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1.1 Literature growth AR1AR2

1167

Documents

Words	2000	12480	23346	34637	71867	94746			
New words	change (560)	oil (287)	downscaling (217)	sres (234)	biochar (1791)	mmms (313)			
	climate (428)	deltac (283)	degreesc (187)	petm (95)	redd (1113)	cop21 (234)			
	co2 (318)	whole (256)	ncep (130)	amf (88)	cmip5 (679)	c3n4 (214)			
	climatic (289)	$\tan (254)$	fco (107)	sf5cf3 (86)	cmip3 (587)	sdg (187)			
	model (288)	landscape (249)	pfc (98)	clc (81)	mofs (299)	zika (182)			
	atmospheric	alternative	otcs (98)	${\it embankment}$	sdm (297)	ndcs (168)			
	(281)	(243)		(81)					
	effect (280)	availability (242)	dtr (95)	cwd (79)	mof (275)	indc (164)			
	global (224)	life (239)	nee (89)	etm (75)	biochars (252)	indes (134)			
	Table 1: Growth in climate change literature								
1.2 Disci	iplinary stı	ructure							

-15

Figure 1: A map of the literature on climate change. Document positions are obtained by reducing the topic scores to two dimensions via t-SNE Documents are coloured by web of science discipline

• Different disciplines clearly deal with different themes, although some topics are more inter-

category. See SI table for topic composition of each grid square

 $\bullet\,$ Medicine has the most specialized topic distribution

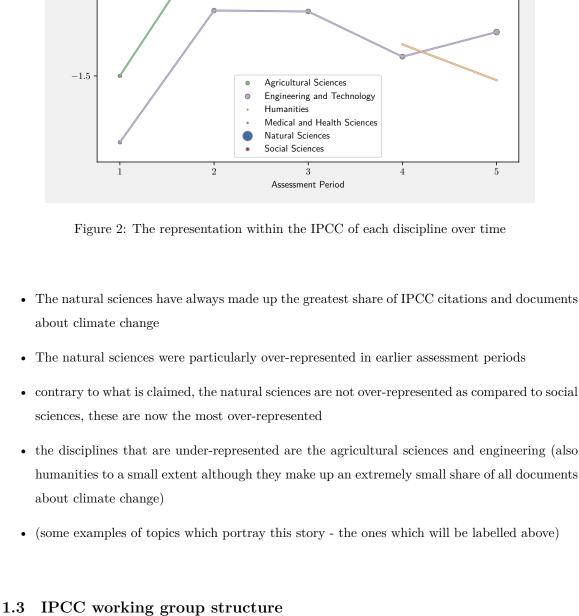
disciplinary

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• (Some examples of individual topics using the labels to be added)

• The thematic structure of the topics reflects journal disciplinary categories.

- -0.5
- Log representation



• Some topics cut across working groups [e.g. Urban, say more about] • Some fast growing topics [e.g. health] are well represented in IPCC [WGII], whereas others (particularly on negative emissions) are not so well represented.

• The thematic structure is also reflected in the division of labour between IPCC working groups. Documents cited by each working group appear in discrete parts of the map (which correspond

Figure 3: A map of the literature on climate change. Document positions are obtained by reducing the topic scores to two dimensions via t-SNE Documents are coloured by working group citations. In each assessment period, the largest cluster of documents relating to each of the 10 fastest growing

topics is outlined.

also to the disciplinary structure)

- Figure 4: Optional figure, instead of above, one large wg map, with the topics below labelled
 - ocean, circulation, deep vulnerability, index, resilience adaptation, local, mitigation

material, waste, concrete

4.9

5.0

building, construction, design

adsorption, membrane, capacity

4.7

4.6

Assessment period occurence

Figure 5: The IPCC representation and age of the topics. Representation shows the log of the share of topic documents in IPCC citations divided by the share of topic documents among all documents. Assessment period occurrence shows the assessment period in which the mean topic document was

cloud, aerosol, radiative

biochar, amendment, application

leaf, photosynthetic, photosynthesis

4.3

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published

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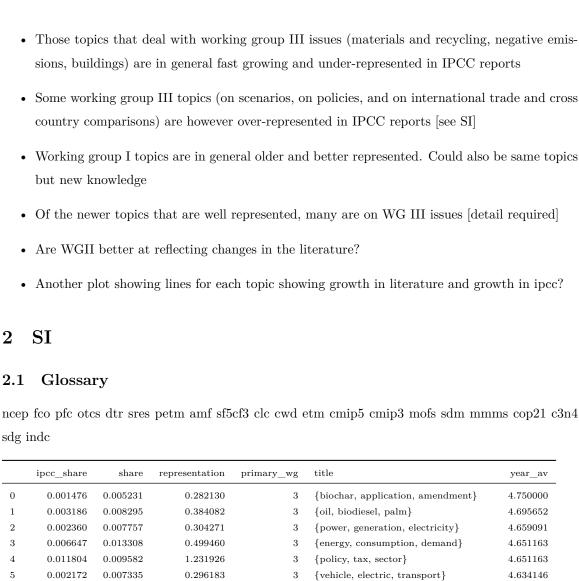
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{cost, price, technology}

 $\{cement,\,material,\,concrete\}$

{country, develop, international}

 $\{ {\it coal, combustion, technology} \}$

{adaptation, vulnerability, farmer}

 $\{ {\it building, design, construction} \}$

{waste, landfill, treatment}

 $\{{\it emission},\,{\it ghg},\,{\it reduction}\}$

{urban, city, urbanization}

{health, disease, human}

 $\{ {\rm specie}, \, {\rm distribution}, \, {\rm habitat} \}$

 $\{ process, \, membrane, \, solvent \}$

 $\{ {\it research, social, issue} \}$

 $\{ drought, \, stress, \, index \}$

 $\{ production, \, food, \, farm \}$

 $\{ {\rm river}, \ {\rm basin}, \ {\rm flow} \}$

{fire, burn, wildfire}

 $\{{\rm crop,\ yield,\ wheat}\}$

 $\{ {\rm rainfall, \ monsoon, \ rain} \}$

 $\{site, elevation, high\}$

 $\{ {\rm tree, \ ring, \ stand} \}$

{plant, seed, stress}

 $\{ {\rm forest},\, {\rm stand},\, {\rm tropical} \}$

{fuel, fossil, engine}

{carbon, low, sink}

{soc, stock, soil}

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Show disciplinary entropy of topics in SI, give examples

Label some topics particularly representative of certain disciplines, and their growth with reference

to below

Just 4 subplots, mashing together ar1-2,

and 3-4

4.632653

4.630435

4.627907

4.600000

4.595745

4.588235

4.586957

4.560000

4.551020

4.530612

4.783784

4.764706

4.717949

4.644444 4.644444

4.638298

4.636364

4.627907 $\{{\bf community},\,{\bf microbial},\,{\bf composition}\}$ {environmental, impact, life} 4.6279074.6097564.604651 $\{ {\it flood}, \, {\it flooding}, \, {\it damage} \}$ 4.600000 $\{ {\tt groundwater, \, recharge, \, aquifer} \}$ 4.600000 $\{scenario,\,future,\,project\}$ 4.595745 $\{system,\,performance,\,design\}$ 4.5869574.5714294.568627 $\{area,\,region,\,distribution\}$ 4.565217 $\{ {\it extreme},\, {\it event},\, {\it weather} \}$ 4.565217 $\{ecosystem,\,terrestrial,\,net\}$ 4.5625004.558140 $\{ {\rm runoff}, \ {\rm catchment}, \ {\rm hydrological} \}$ 4.551020 $\{ wetland, \, marsh, \, habitat \}$ 4.5208334.520000 $\{ water, \, resource, \, irrigation \}$ 4.510638 $\{ {\it biomass, above ground, bioenergy} \}$ 4.4800004.4716984.4705884.470588 $\{{\rm change,\,climatic,\,response}\}$ 4.4528304.450980 $\{ {\rm rate},\, {\rm litter},\, {\rm decomposition} \}$ 4.4423084.437500 $\{{\tt growth,\,economic,\,relationship}\}$ 4.433962 73 26 77 32 43 13 81

> .7% .7% 31%6%

1