

Hot spots - cold spots - what dots?

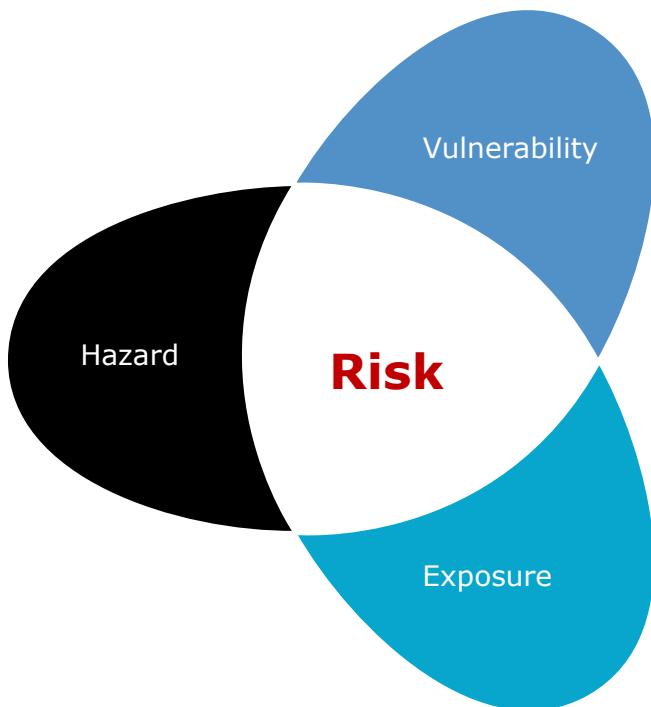
A critical reflection on integrated climate risk assessments –
example flood risk in Austria

Stefan KIENBERGER & Jutta-Lucia LEIS

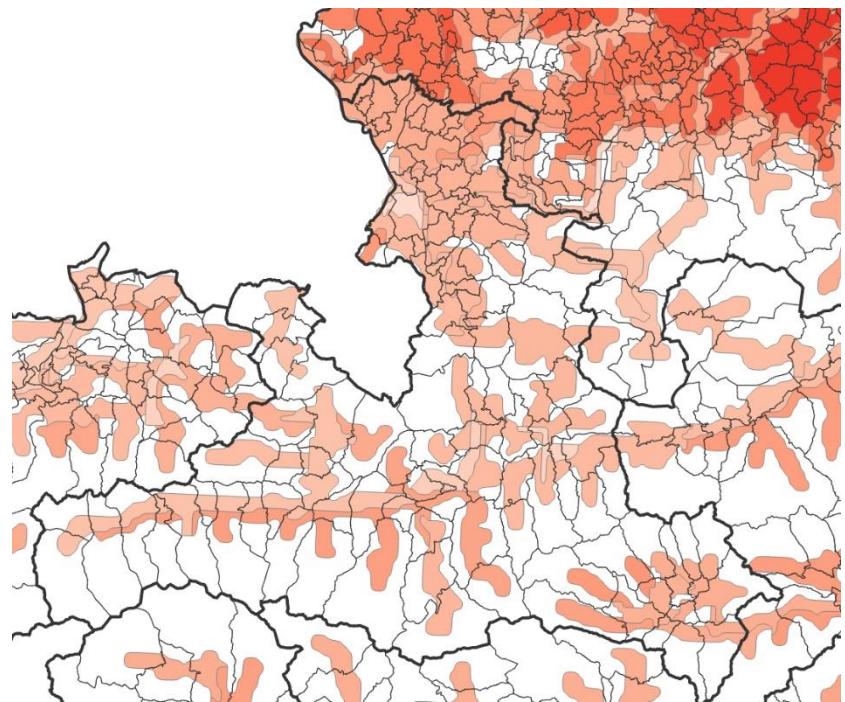
Department of Geoinformatics – Z_GIS | University of Salzburg

Innovations

Application of the 'new' IPCC (AR5) risk and vulnerability concept

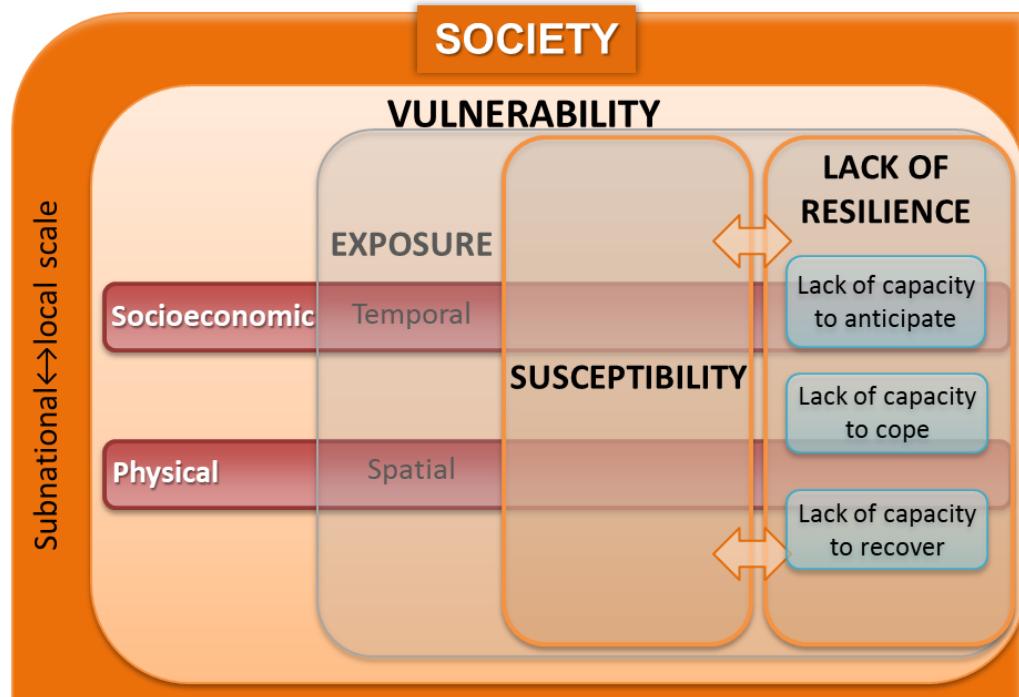


Homogenous, spatial regions of vulnerability and risk



Innovations

Application of the 'new' IPCC (AR5) risk and vulnerability concept



MOVE FRAMEWORK
(after Birkmann et al 2013)

Innovations

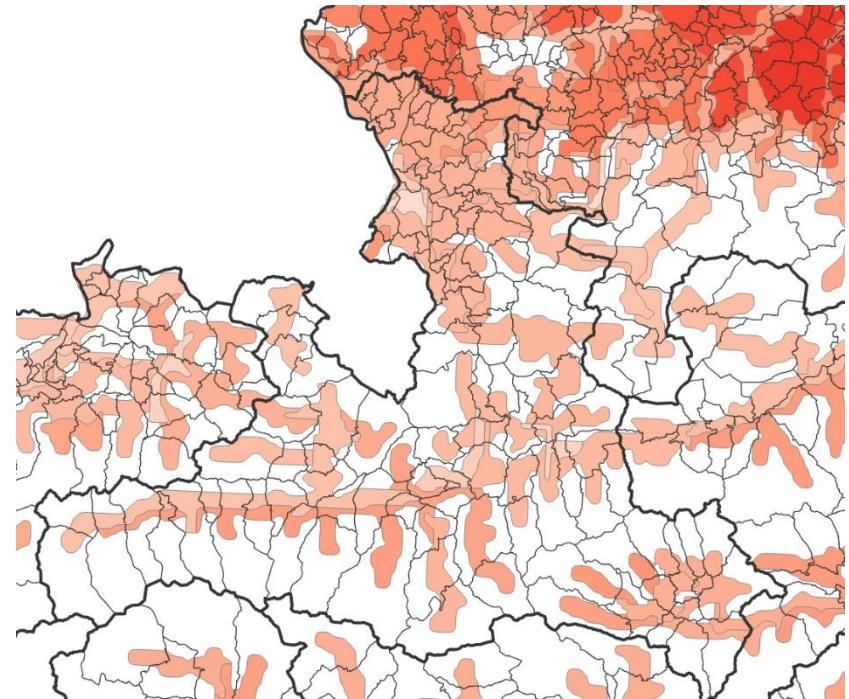
**Homogenous, spatial regions
of vulnerability and risk**

'Geon'

**Spatially-explicit, independent of
administrative units**

**Quantitative & qualitative
character**

Based on gridded data



Results

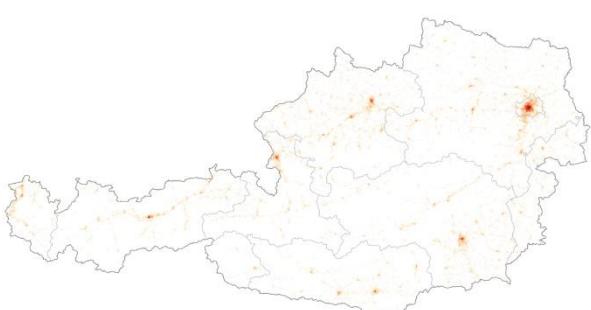
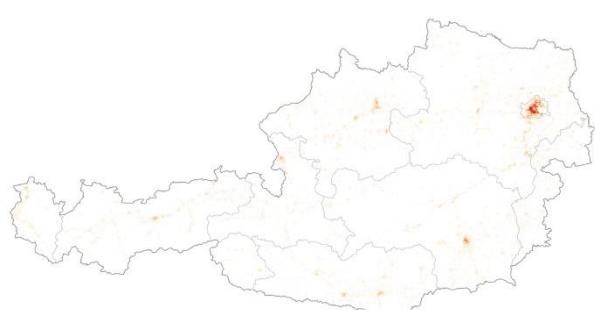
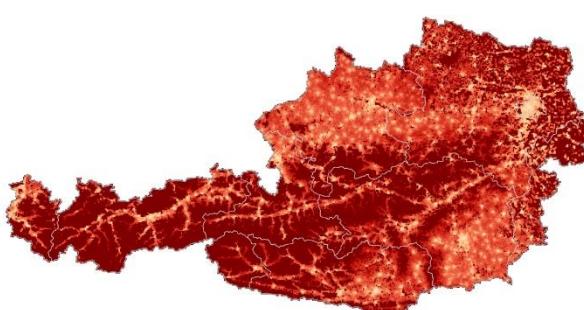
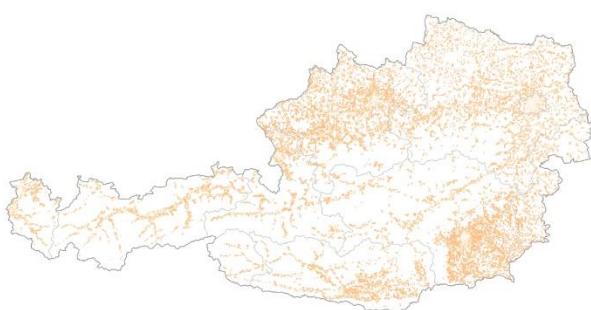
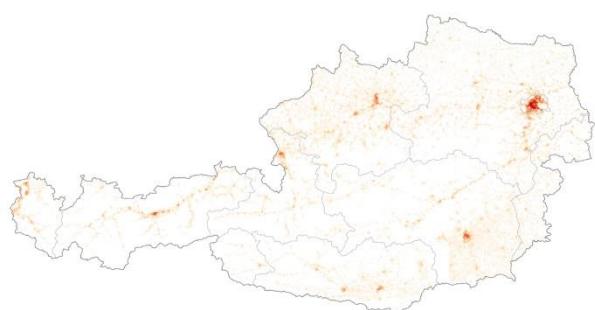
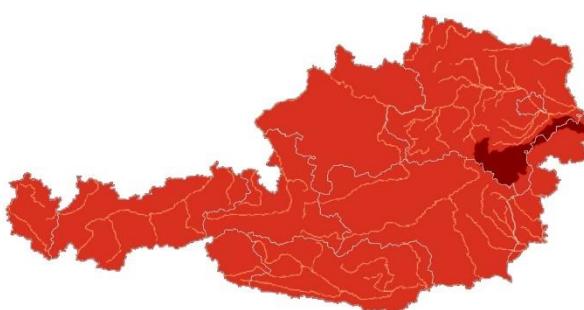
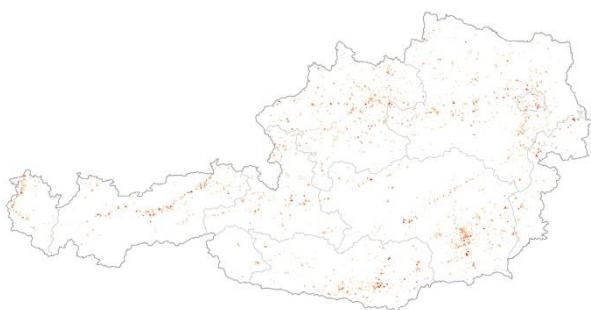
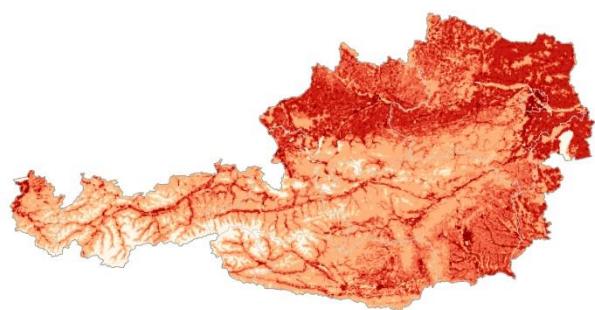
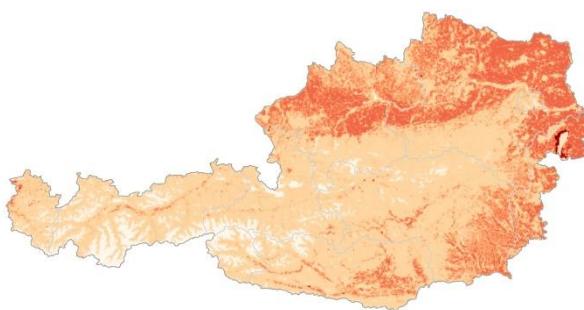
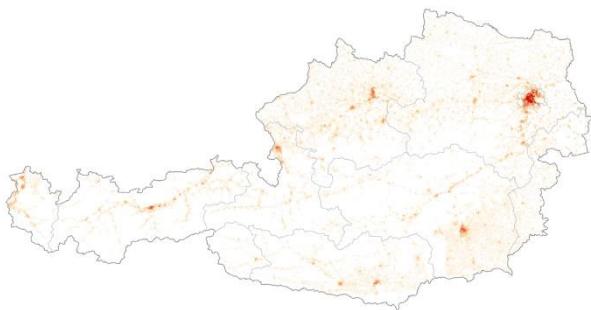
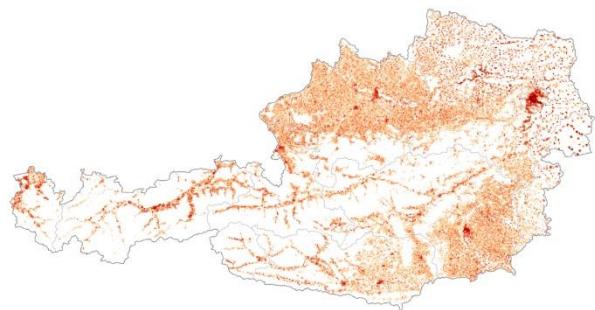
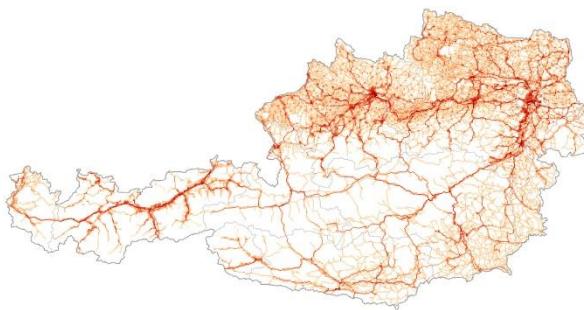
Risk & Vulnerability – ‘Floods’

Indicators

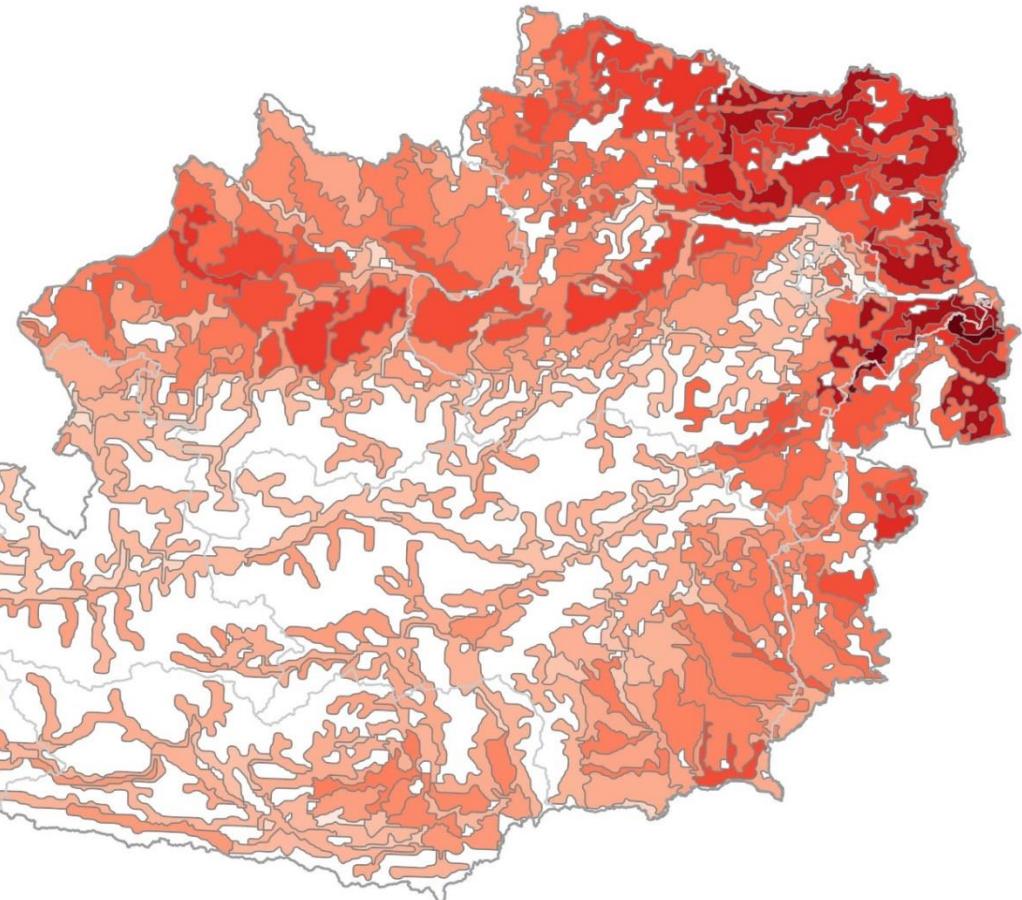
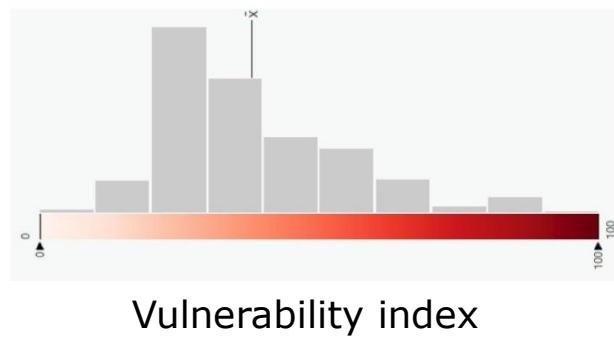
Socio-economic dimensions

Risk Component	Domain	Composite indicators	Single Indicators	Sign	Weighting	Data Source	Date
Hazard		Consecutive Wet Days [Flood probability]		n/a		ÖKS15/HORA	
Exposure		Permanent settlement area		+	n/a	STATAT	2011
Socio-economic Vulnerability	Susceptibility	Transport infrastructure	Highways	+	0,25	GIP	2017
			Primary roads	+	0,25	GIP	2017
			Secondary roads	+	0,25	GIP	2017
			Railway	+	0,25	GIP	2017
		Employment by sectors	Employment in primary sector	+	0,50	STATAT	2015
			Employment in secondary sector	+	0,35	STATAT	2015
			Employment in tertiary sector	+	0,15	STATAT	2015
		Age distribution	Population under 20 years	+	0,40	STATAT	2016
			Population between 20 and 64 years	+	0,20	STATAT	2016
			Population over 64 years	+	0,40	STATAT	2016
		Ecosystem services	Food production	+	0,30	CLC	2012
			Disturbance regulation	-	0,25	CLC	2012
			Recreation	+	0,20	CLC	2012
			Raw materials	+	0,25	CLC	2012
		Landuse	Cropland	+	0,20	CLC	2012
			Pasture	+	0,20	CLC	2012
			Woodland/forest	+	0,10	CLC	2012
			Industrial/commercial	+	0,25	CLC	2012
			Urban	+	0,25	CLC	2012
		Urbanization		+	n/a	CadasterENV (HR Change Alert Map)	2006-2012
			Forecasting model presence for river	-	0,75	BMNT - Hochwasserprognose	2018
	L.o.A.	Early warning system	Forecasting model presence for catchment	+	0,25	BMNT - Hochwasserprognose	2018
			Origin Austria	+	0,28	STATAT	2016
		Origin	Origin Europe/Northern America/Australia	+	0,33	STATAT	2016
			Origin MEDCs/LEDSs/unknown	+	0,40	STATAT	2016
			Academic degree	-	0,23	STATAT	2015
		Education level	Matura or other higher school certificate	-	0,23	STATAT	2015
			Apprenticeship	-	0,23	STATAT	2015
			Compulsory school certificate	-	0,30	STATAT	2015
			Access to health services	-	0,50	STATAT (Accessibility-Study)	2014
		Accessibility	Access to security services	-	0,25	STATAT (Accessibility-Study)	2014
			Access to retail services	-	0,25	STATAT (Accessibility-Study)	2014
			Unemployment	+	n/a	STATAT	2015
		Size of companies	Micro-enterprises	+	0,40	STATAT	2011
			Small enterprises	+	0,30	STATAT	2011
			Medium-sized enterprises	+	0,20	STATAT	2011
			Large enterprises	+	0,10	STATAT	2011

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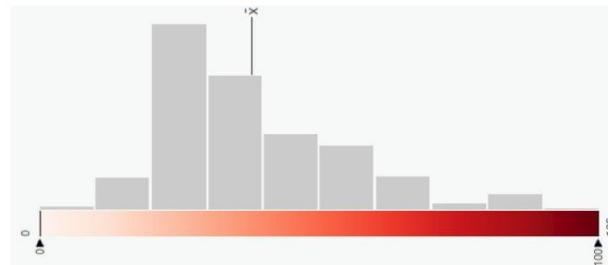


Socio-economic vulnerability

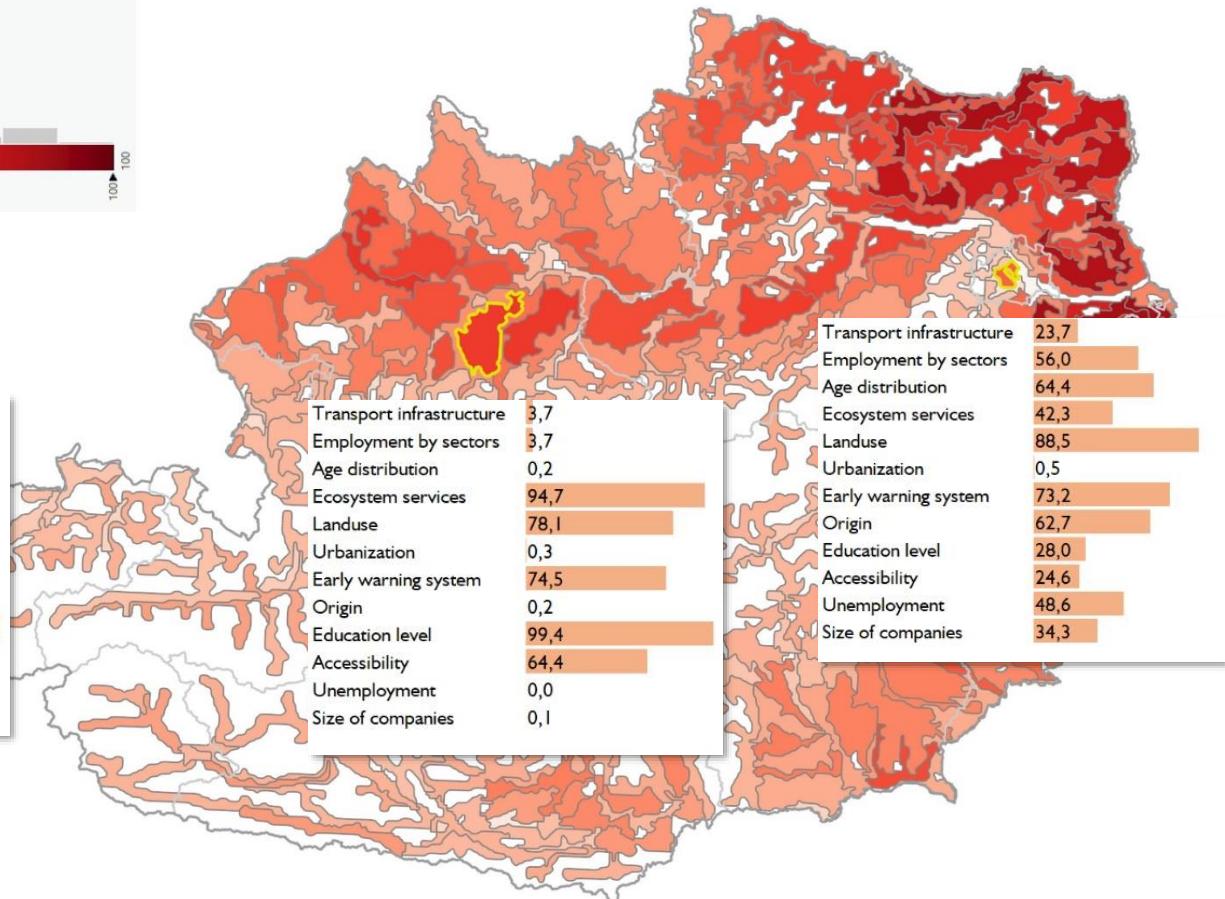
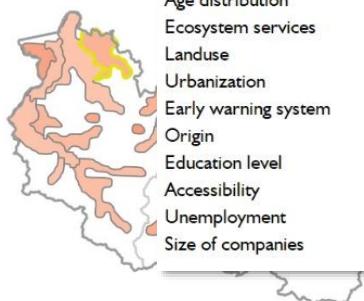


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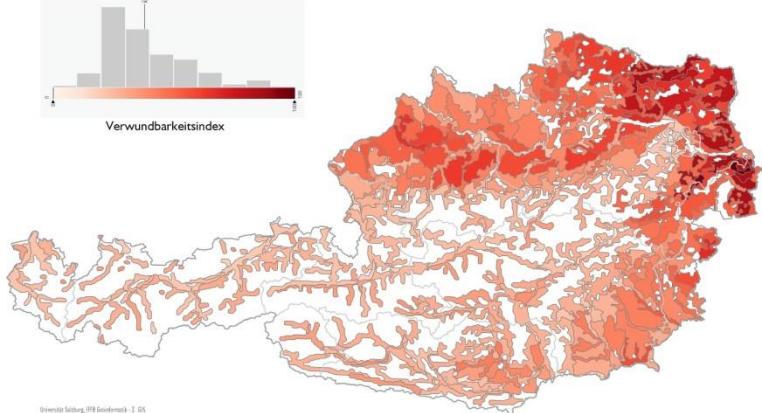
Socio-economic vulnerability



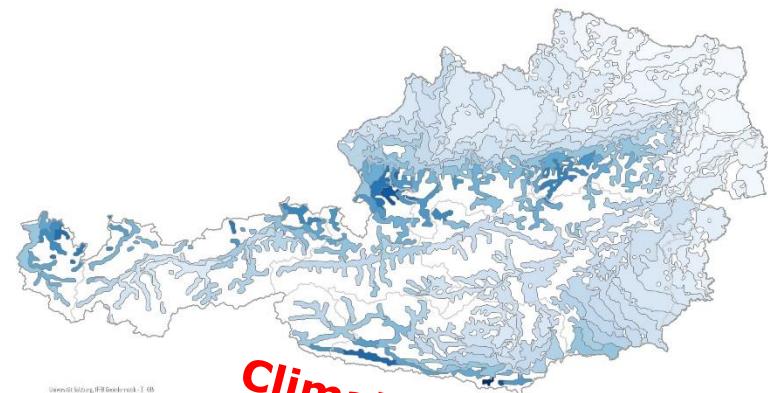
Vulnerability index



Socio-economic vulnerability

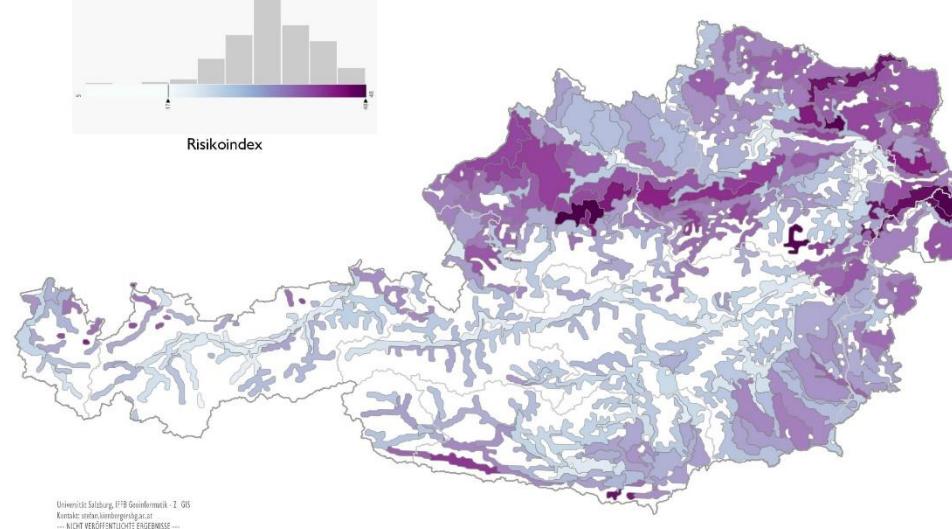


rx5 | Maximum 5-day precipitation

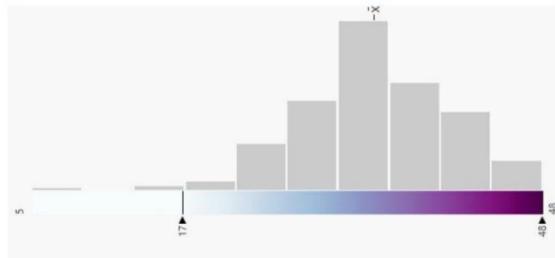


**Climate Change Context
No Hydro Models applied!**

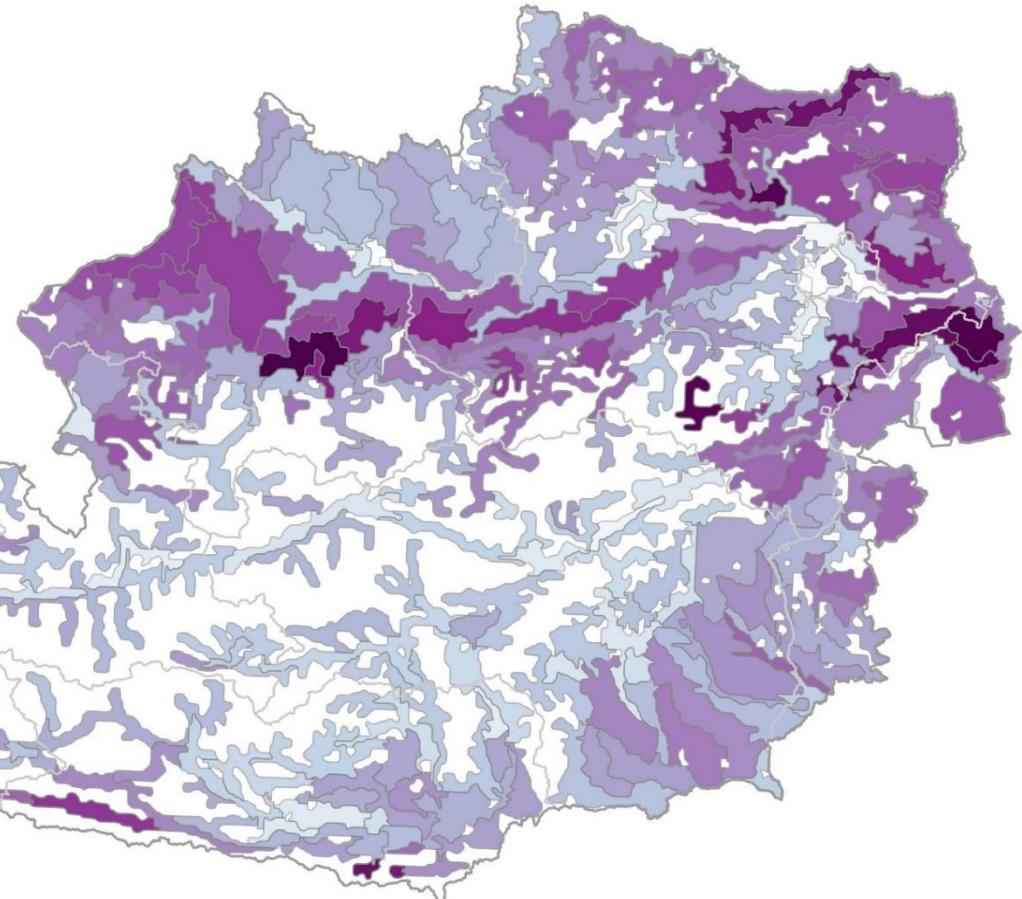
Socio-economic Risk to floods



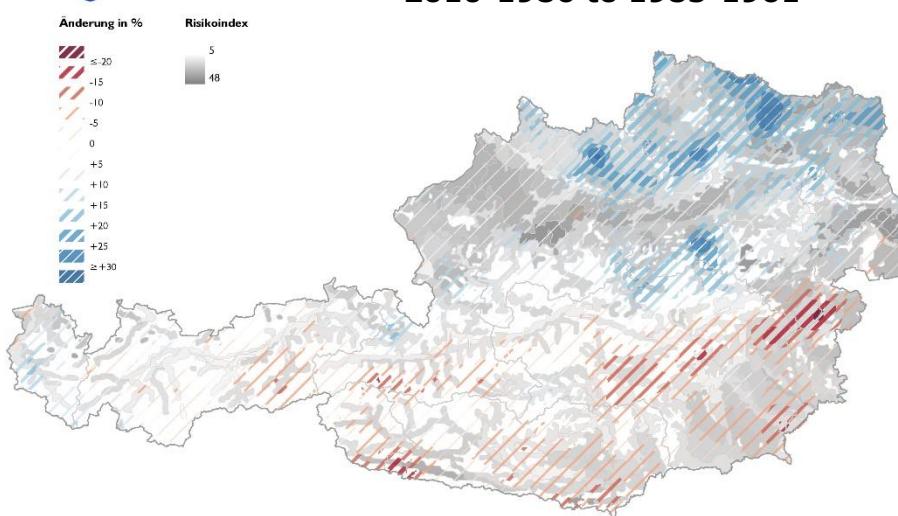
Socio-economic Risk to floods



Risk index

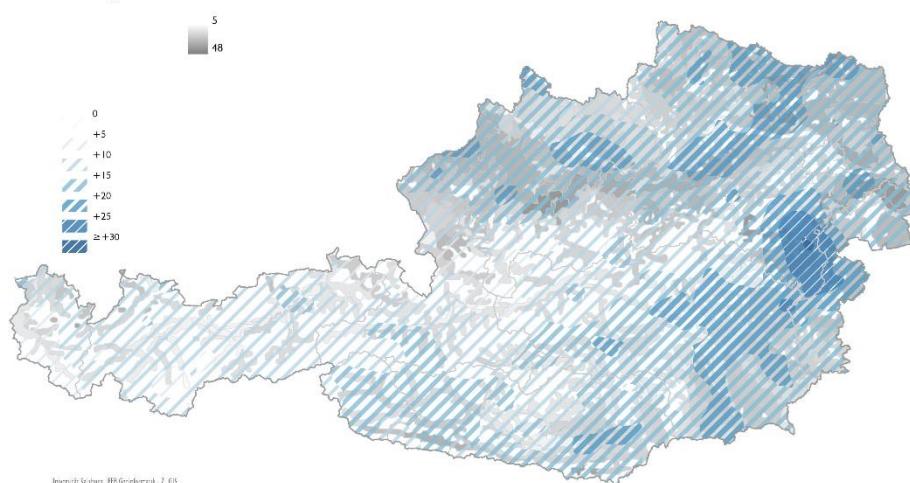


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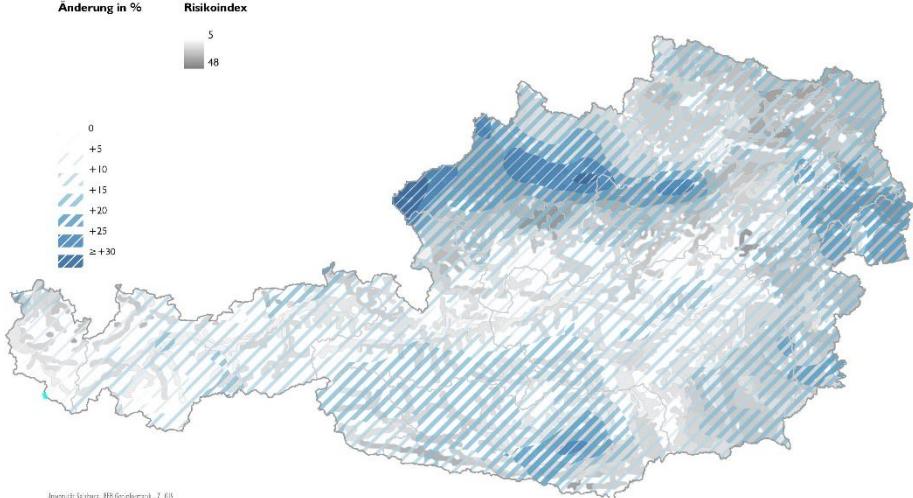
Present and future socio-economic risk

RCP4.5. | 2100 to present[2010-1986]

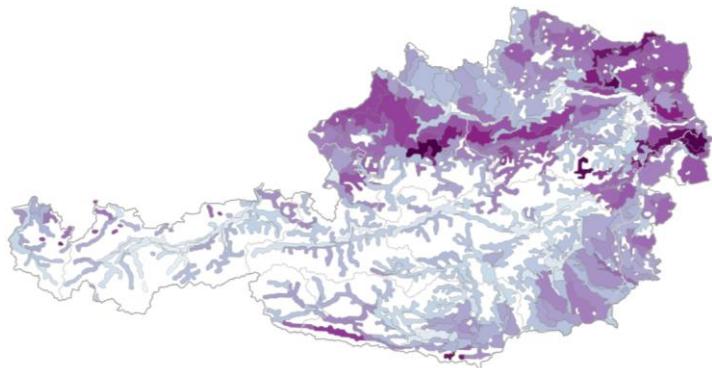


Berechnung: HR-Großraum 1:65
Sensitivität: 10% Änderung
... NICHT VERÖFFENTLICHTES ERGEBNIS ...

Δrx5
RCP8.5. | 2100 to present[2010-1986]



Berechnung: HR-Großraum 1:65
Sensitivität: 10% Änderung
... NICHT VERÖFFENTLICHTES ERGEBNIS ...



Conclusions & main messages

■ Re Innovation #1

- IPCC Risk Framework provides a sound basis for identifying and relating risk factors; especially closing gaps between DRR and Climate Change community

■ Re Innovation #2

- Homogenous regions – based on users feedback – provide an alternative to ‘artificial’ admin boundaries, as well as an alternative to ‘dumb’ grid cells. Regions can be described through an index, but also by its contributing factors – important for targeting intervention measures

■ General observations

- Challenges in narrowing down indicator framework; what indicators do really count – especially for vulnerability
- Scale gap between ‘generic’ vulnerability and detailed flood hazard zone delineation [not shown here]
- Future climate proxy [rx5] to be taken with care vs hydrological modelling; but provides interesting opportunities for future risk identification