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Scandic Marina Congress Center

UNIVERSITY of SALZBURG

Lay severe weather competence

A pilot study on Brazil, India, and Germany

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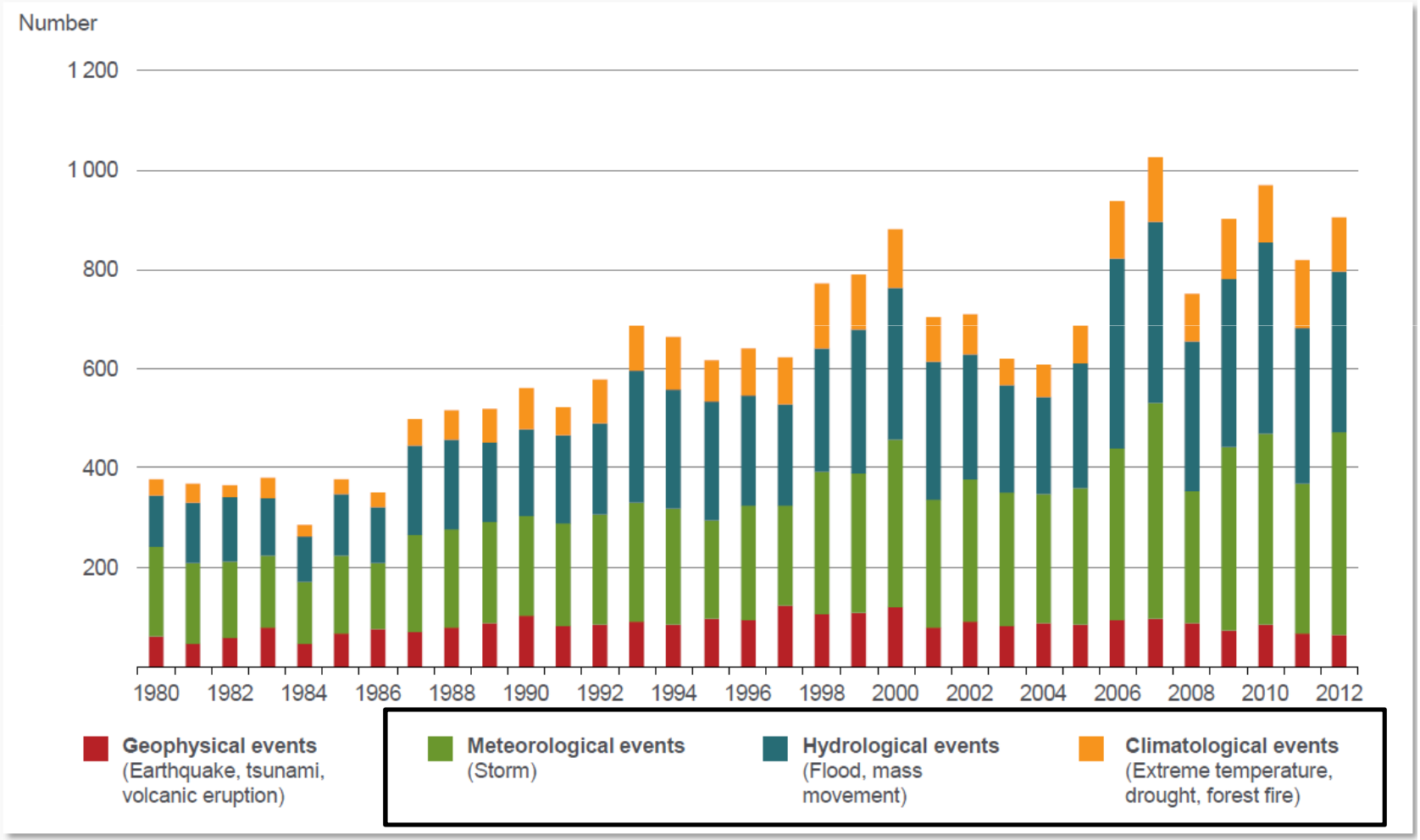
UNICAMP

Global Natural Catastrophe Update

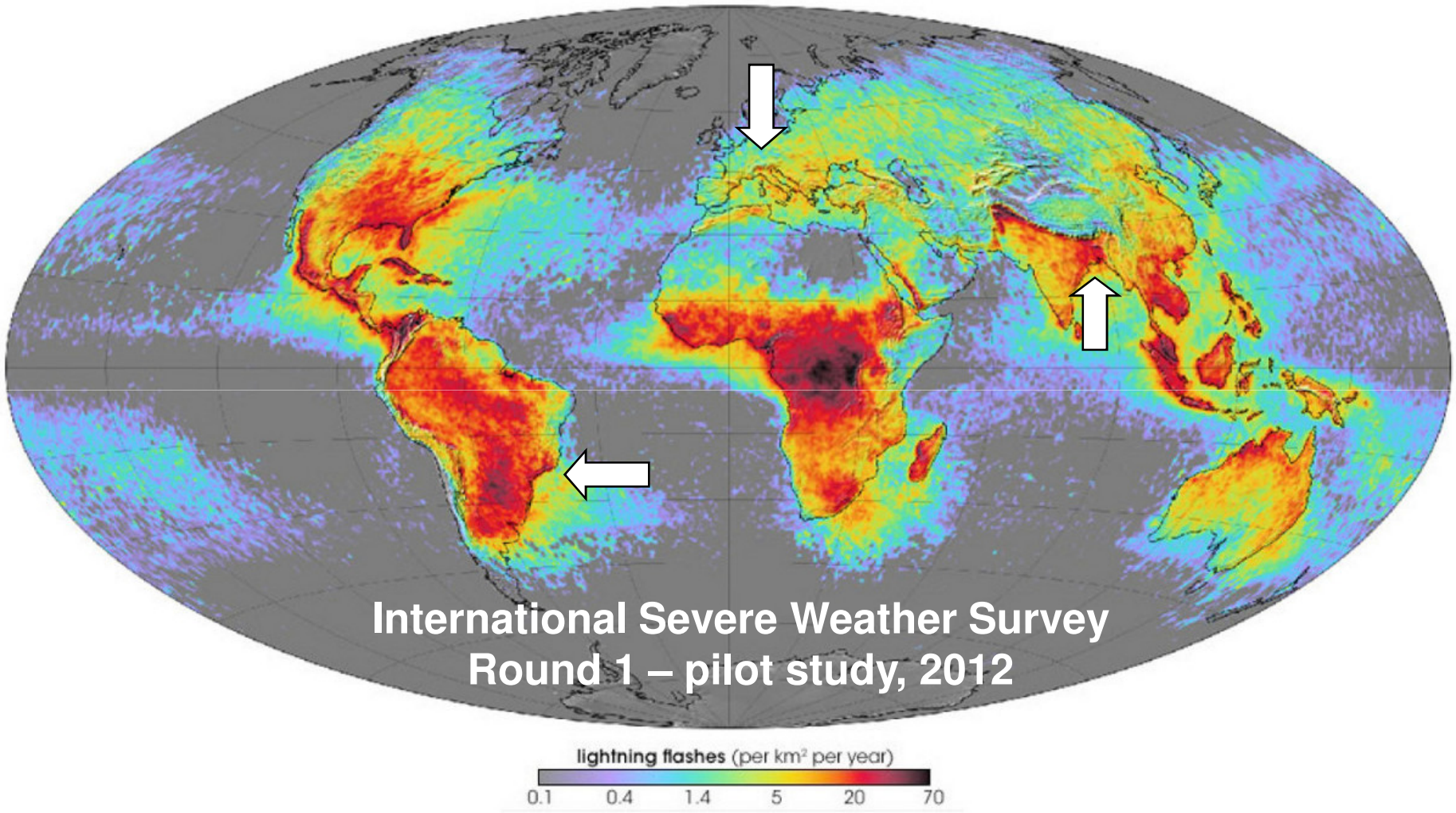
Natural catastrophes worldwide 1980 – 2012

Number of events

Munich RE



Source: Geo Risks Research, NatCatSERVICE – As at January 2013



São Paulo state (Brazil), Bavaria (Germany), Nagaland (India)

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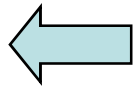
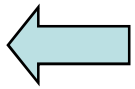
EM-DAT, 1981-2010, Brazil, India, Germany

Disaster Type	Number	%
Flood	78	54,6
Mass movement wet	17	11,9
Epidemic	13	9,1
Drought	12	8,4
Storm	12	8,4
Extreme temperature	5	3,5
Wildfire	3	2,1
Earthquake (seismic activity)	2	1,4
Insect infestation	1	0,7
Total	143	



	%	Total
Hydrometeorological	60,9	160
Biological	9,8	14
Geophysical	1,4	2



Created on: Apr-12-2013. - Data version: v12.07
Source: "EM-DAT: The OFDA/CRED International Disaster Database
www.emdat.be - Université Catholique de Louvain - Brussels - Belgium"

Campinas, São Paulo state, Brazil

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Population, climate, severe weather Brazil

Campinas, São Paulo state, 685 m

1 million inhabitants, modern high-rise city

Subtropical climate, precipitation average

1,400 mm, 70% spring to summer time

heavy rainfall, winds, tornado-prone

Urban expansion, deforestation led to

increased floods


CHINA
Nagaland
NEPAL
BHUTAN
PAKISTAN
New Delhi
INDIA
BANGLADESH
Arabian Sea
Bay of Bengal
MYANMAR (Burma)
Kohima, Nagaland state, India

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Population, climate, severe weather India

Nagaland state, NE India, population 1.9 millions, capital Kohima, Naga Hills rising from 600 to 1,800 m

Humid subtropical climate, mild summers, Monsoon rainfalls June-Sept, average 1,300-2,500 mm, landslides, tornado cluster NE India

Rosenheim, Bavaria, Germany, Europa

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Population, climate, severe weather Germany

Rosenheim area, Bavaria (population 12.4 mio) in southern Germany, 450 m, Alpine foothills

Oceanic/humid to warm summer continental climate, July temperature maximum, showers and thunderstorms spring – summer, tornadoes possible

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SEVERE WEATHER SURVEY **© A.G.K. 2012**

The following questions are about your daily weather information and severe weather.
Thank you very much for your interest to take part in this anonymous survey.

Do you personally take an interest in weather?
☐ yes, always ☐ yes, often ☐ sometimes ☐ no, not at all

How dangerous do you think are the following severe weather phenomena for you?
Give each of them a number between: *10=very dangerous* and *0=not dangerous at all*

….. hurricane/cyclone ….. heat ….. landslide ….. hail ….. tornado

….. flood ….. avalanche ….. lightning ….. snow/ice ….. heavy rain

Do you feel well-informed about severe weather? ☐ generally yes ☐ at times ☐ no

Do you feel personally prepared for risks of severe weather? ☐ yes ☐ partly ☐ no

Do you hold an insurance for risks of severe weather? ☐ yes, for most ☐ for some ☐ no

Questionnaire samples

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Hazard	India	Brazil	Germany
sample (n)	100	104	80
mean age yrs.	35.8	37.2	38.8
age range yrs.	18-57	19-73	20-78
male %	50.0	50.0	51.2
female %	50.0	50.0	48.8
adults/household	2.6	2.2	1.5
children/househ.	2.1	0.3	1.1
basic educ.%	17.0	16.3	14.1
high educ.%	66.0	53.8	30.8
single houses%	52.0	68.3	20.5
multistorey h.%	21.0	2.9	50.0

TABLE I: Survey sample population characteristics.

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Weather interest

all above 50% (Germany even 80%)

Interest in media weather reports

India 31%, Brazil and Germany 53%

Main sources of MET information

India TV-newspapers, Brazil TV-internet,
Germany internet-radio-TV

MET report legibility

rated medium by all samples

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Meteorological lay knowledge

operationalized by definitions of high/low,
cold front, tornado, cloud names
India low (e.g. 83% no cloud names),
Brazil medium, Germany high

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Hazards	India	Brazil	Germany
hurricane*	5.1	7.8	7.6
heat	3.7	6.1	4.5
landslide	7.6	8.9	6.2
hail	3.9	6.8	6.7
tornado	4.4	7.4	8.1
Flood	4.4	9.1	7.8
avalanche	3.2	5.9	6.4
lightning	5.2	7.4	5.5
snow	2.0	2.9	5.3
rainfall	5.6	7.1	5.1

TABLE II: Subjective risk of meteorological hazards (10-point Likert scale, 0=no, 10=high danger), mean values per survey area.
* "severe storm" in Germany

maximum risk

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9.1

7.6

8.1

Main subjective risks (0-10):

Flood Brazil, landslide India, tornado Germany

Flooding Kolbermoor/Rosenheim, June 3, 2013

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Actual events	India	Brazil	Germany
lightning nearby	58.0	68.3	40.0
lightn. damage	4.0	27.9	22.5
flood damage	9.0	8.7	28.7
storm damage	11.0	29.8	40.5

TABLE III: Frequency of actual events, percentages per area.

high medium low exposure

Compared to their lay risk assessment,
the respondents from India and Brazil had not experienced main risks, but the Germans had.

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Aware/prepared	India	Brazil	Germany
weather-exposed	58.0	67.3	35.0
(partly) prepared	83.0	45.2	78.8
(partly) insured	67.0	10.6	53.8

TABLE IV: Risk awareness and preparedness, percentages per area.

High/bad low exposure/good preparedness

Do risk assessment, experience and exposition lead to more risk preparedness and insurance? Respondents from India and Germany feel prepared and more than 50% are insured. In Brazil, reported preparedness is less and insurance minimal.

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Education effects

Is weather interest and preventive behavior education-dependent? Definitely no for Brazil and Germany, partly true for India – higher education goes with more weather interest.

In all three countries, general weather interest correlates with media weather report interest. In Brazil, more weather interest/preparedness means a higher estimated flood risk.

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Age effects

In India, no age effects were noticed.
In Brazil and Germany, older people followed daily weather reports more closely. Germans also held more weather-hazard insurances.

Gender effects

In India, more males reported a weather insurance (family role?). In Brazil, females reported more weather hazard preparation, German females more weather hazard fear.

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Discussion: Pilot results should not be over-interpreted. Some findings are interesting:

1. Weather interest and involvement is no education-based „priviledge", but depends on personal factors and age.
2. Lay risk assessment does not follow objective risk and damage experience, but dread risks and publicized events have more influence.
3. Therefore, media should address possible hazards and prevention repeatedly and with a consistent message, not helplessness.

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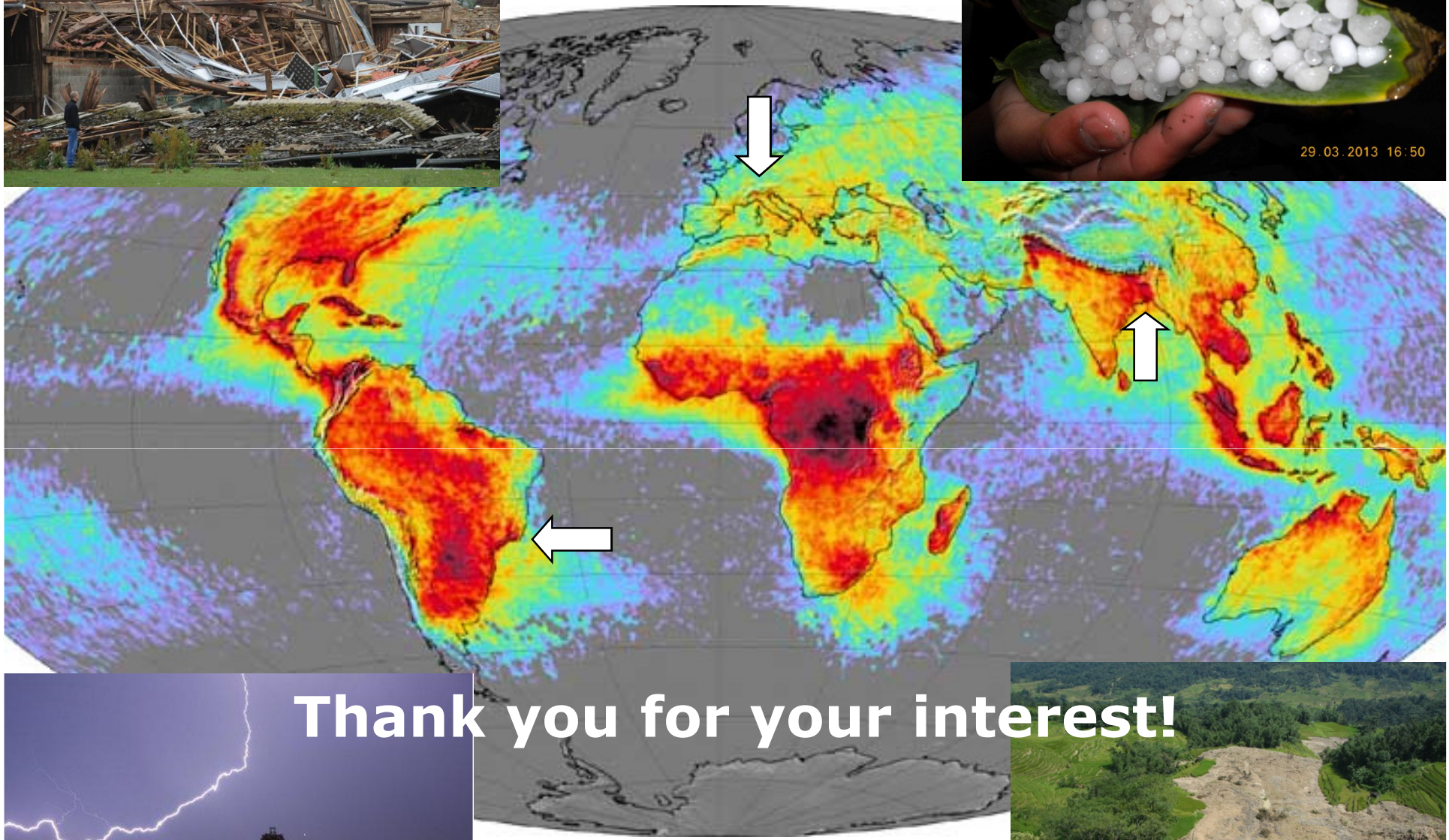
International Severe Weather Survey Round 2 – 2013

Victoria, Australia - finished
Oklahoma, USA – in progress
Malaysia - planned
Uganda – planned

Interest to include some more areas –
Venezuela, GUS state, Western Africa, Japan?

Results to be reported at the 8th ECSS 2015...



Thank you for your interest!

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