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Overview of Disaster Risk Reduction at natural UNESCO Designated sites

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UNESCO, Section on Earth Sciences and Geo-Hazards Risk Reduction,
France



第三届联合国教科文组织名录遗产与可持续发展黄山对话会
The 3rd Huangshan Dialogue on UNESCO Sites and Sustainable Development

中国·黄山
HUANGSHAN • CHINA

主题：UNESCO名录遗产可持续发展
Theme: UNESCO Sites facilitating Sustainable Development





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Natural UNESCO designated sites



The **World Heritage** List includes properties forming part of the cultural and natural heritage which the World Heritage Committee considers as having outstanding universal value.



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World Network of Biosphere Reserves (WNBR) seek to reconcile conservation of biological diversity.



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UNESCO
Global
Geoparks

The **UNESCO Global Geoparks** Network unifies areas with geological heritage of international significance.



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Natural UNESCO designated sites



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Sustainable
Development
Goals

Resilience symbols for communities



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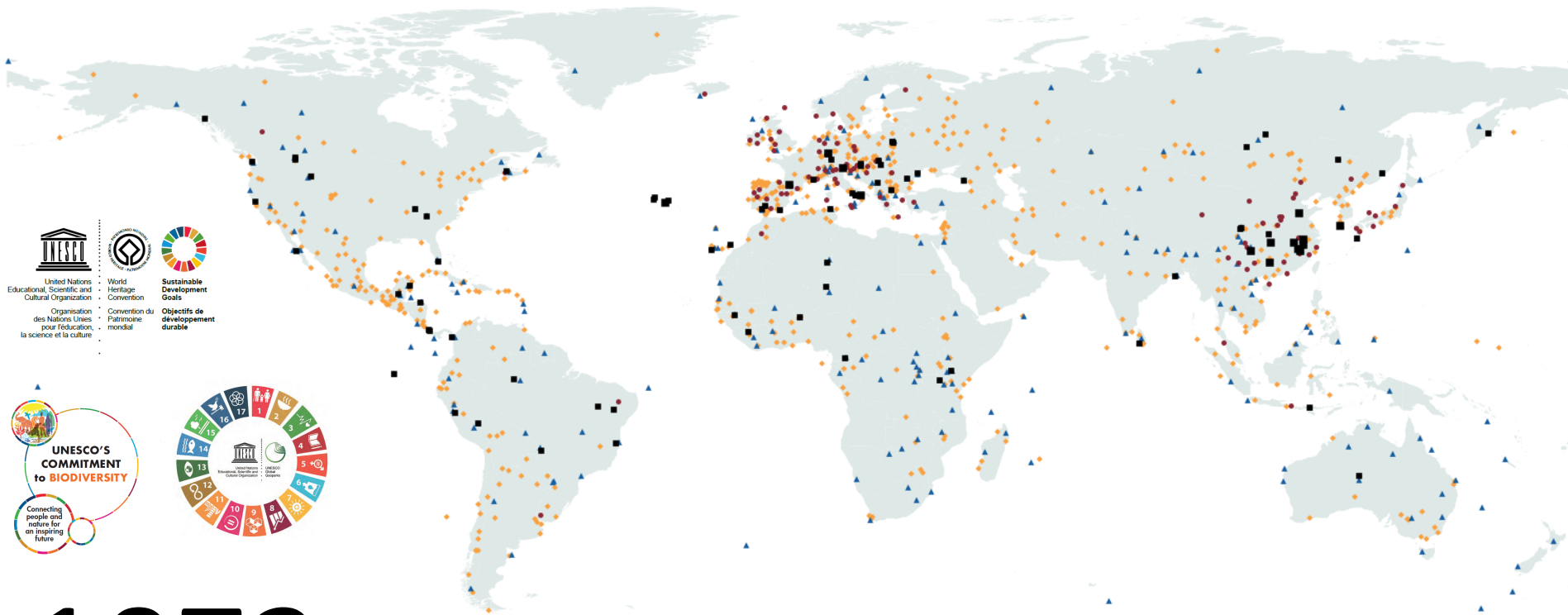


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Sustainable
Development
Goals

Natural UNESCO designated sites



1073

sites in 2018

How many of them are exposed to natural hazards?



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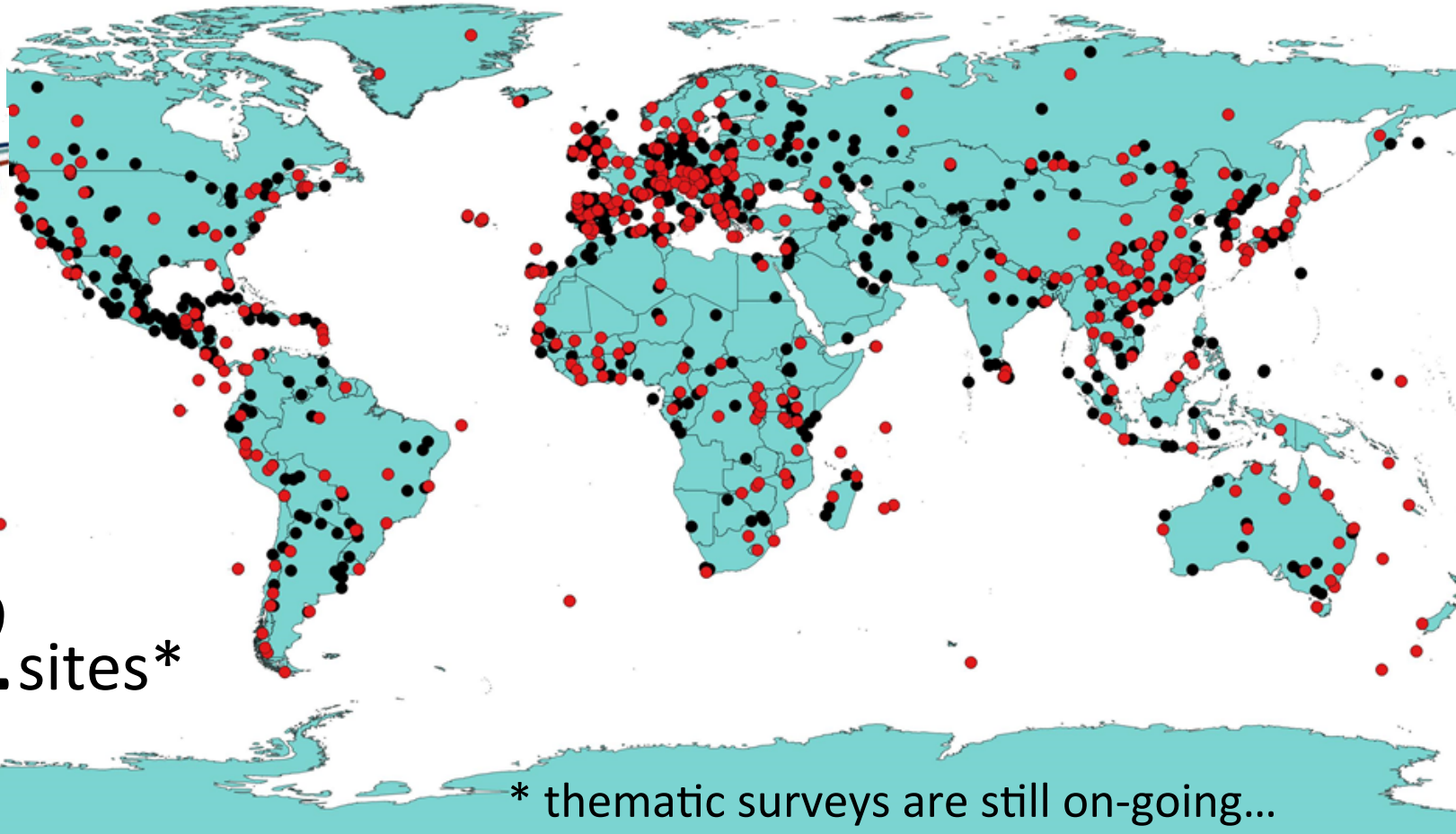
Exposure to natural hazards at natural UNESCO sites



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502 sites*

* thematic surveys are still on-going...



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Recent disasters at natural UNESCO sites



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Eyjafjallajökull Volcano eruption in 2010
Katla UGG, Iceland



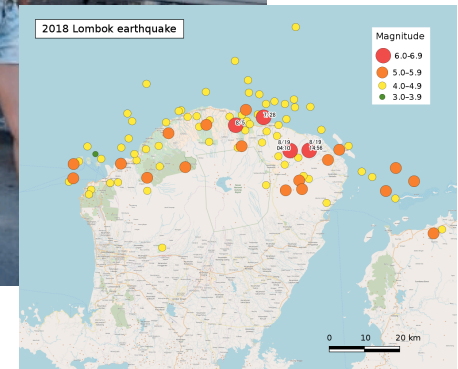
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Recent disasters at natural UNESCO sites



North Lombok earthquake in 2018
*Rinjani-Lombok Biosphere reserve and Geopark,
Indonesia*



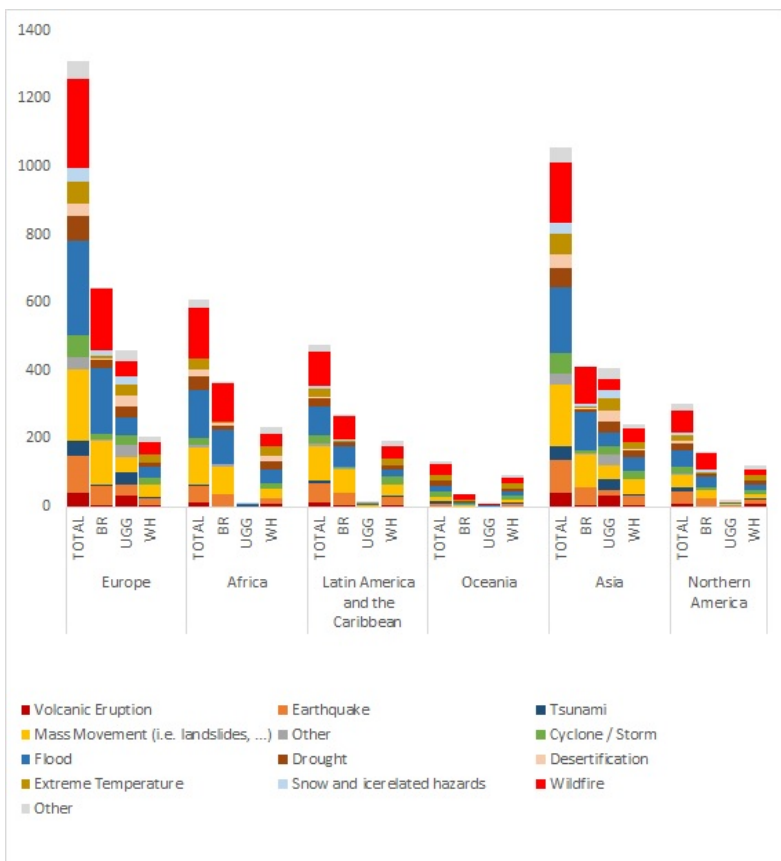
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Mapping of natural hazards at natural UNESCO sites: **Exposure**



Earthquakes



Mass movements



Wildfire



Floods

Disaster risk reduction at natural UNESCO sites



Risk Assessment

- Hazard
- Risk
- Vulnerability

Disaster risk management

- Protection measures
- Use of ecosystem Services
- Use of Traditional Knowledge

Awareness raising & education

- Awareness Raising to communities
- Sharing Good practices

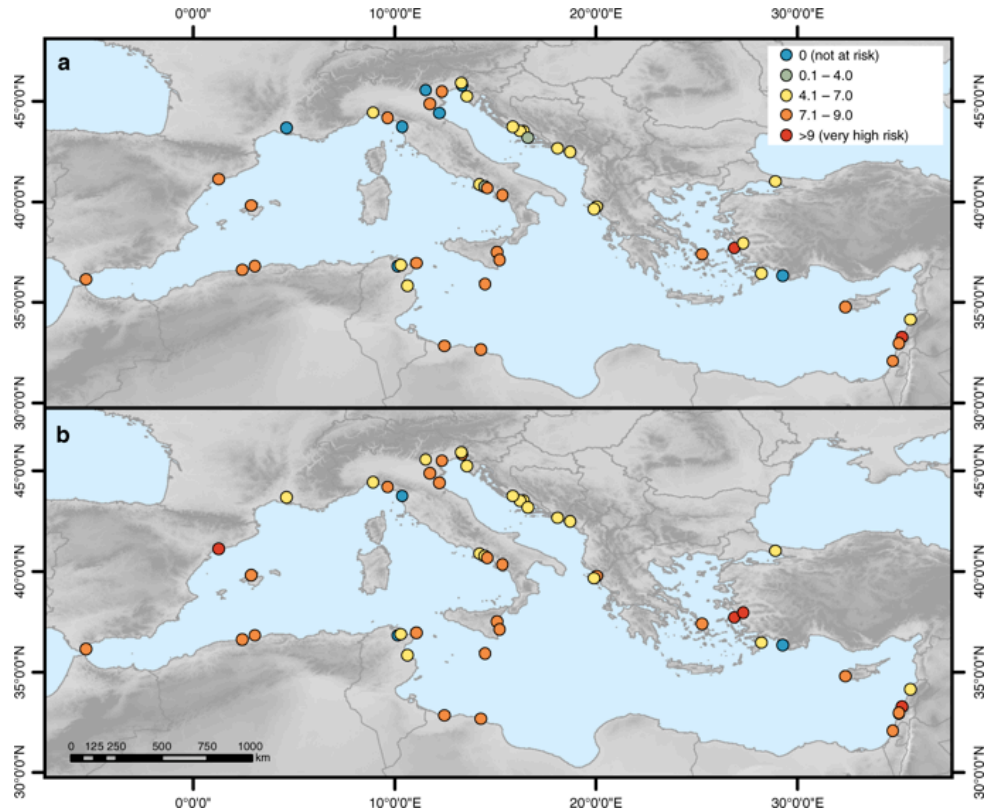


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Risk assessment of UNESCO designated sites



Mediterranean UNESCO World Heritage at risk from coastal flooding and erosion due to sea-level rise

Lena Reimann et al. 2018

Nature



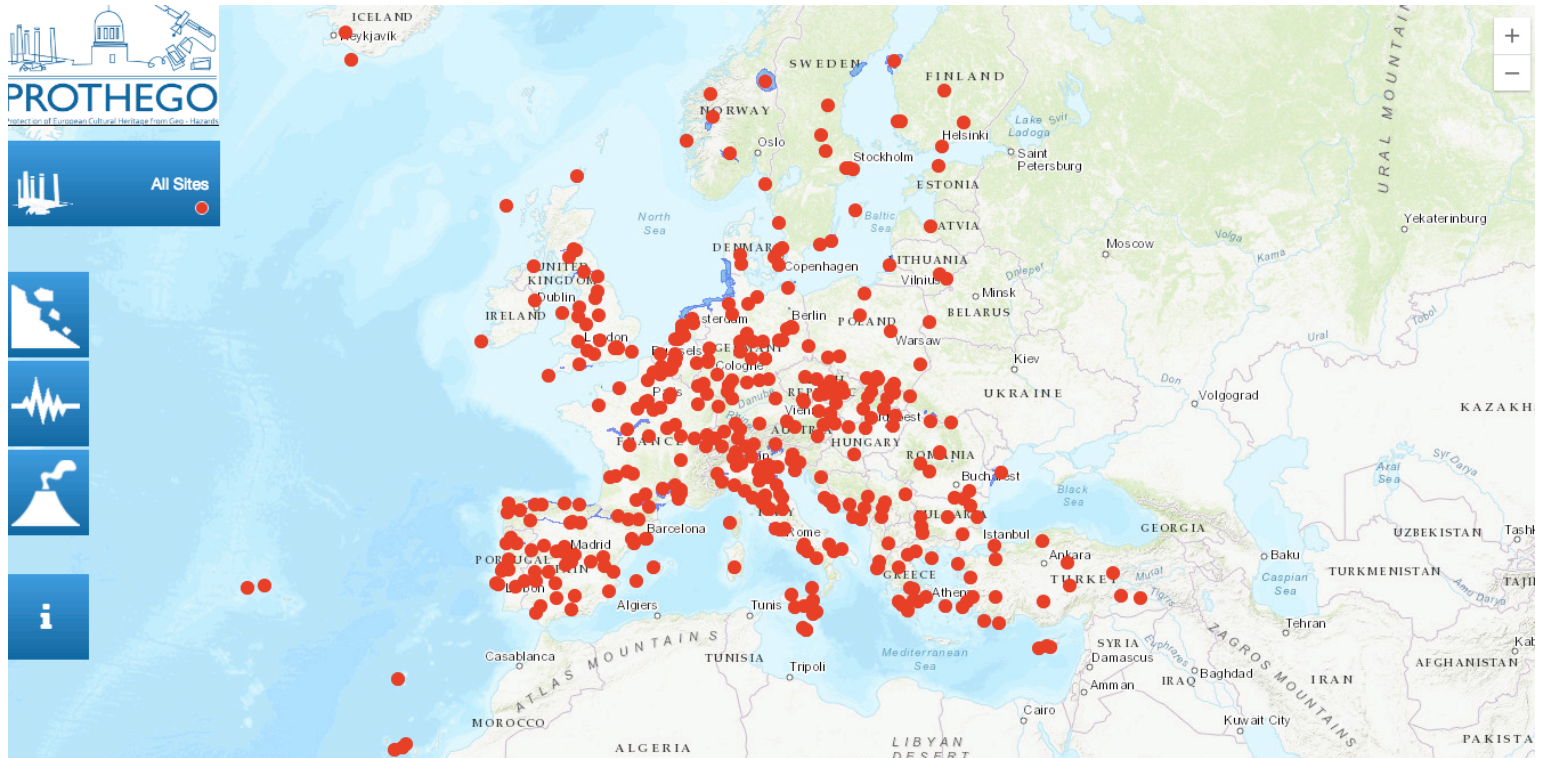
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Risk assessment of UNESCO designated sites



Interactive hazard map of European world heritage sites

PROTHEGO project



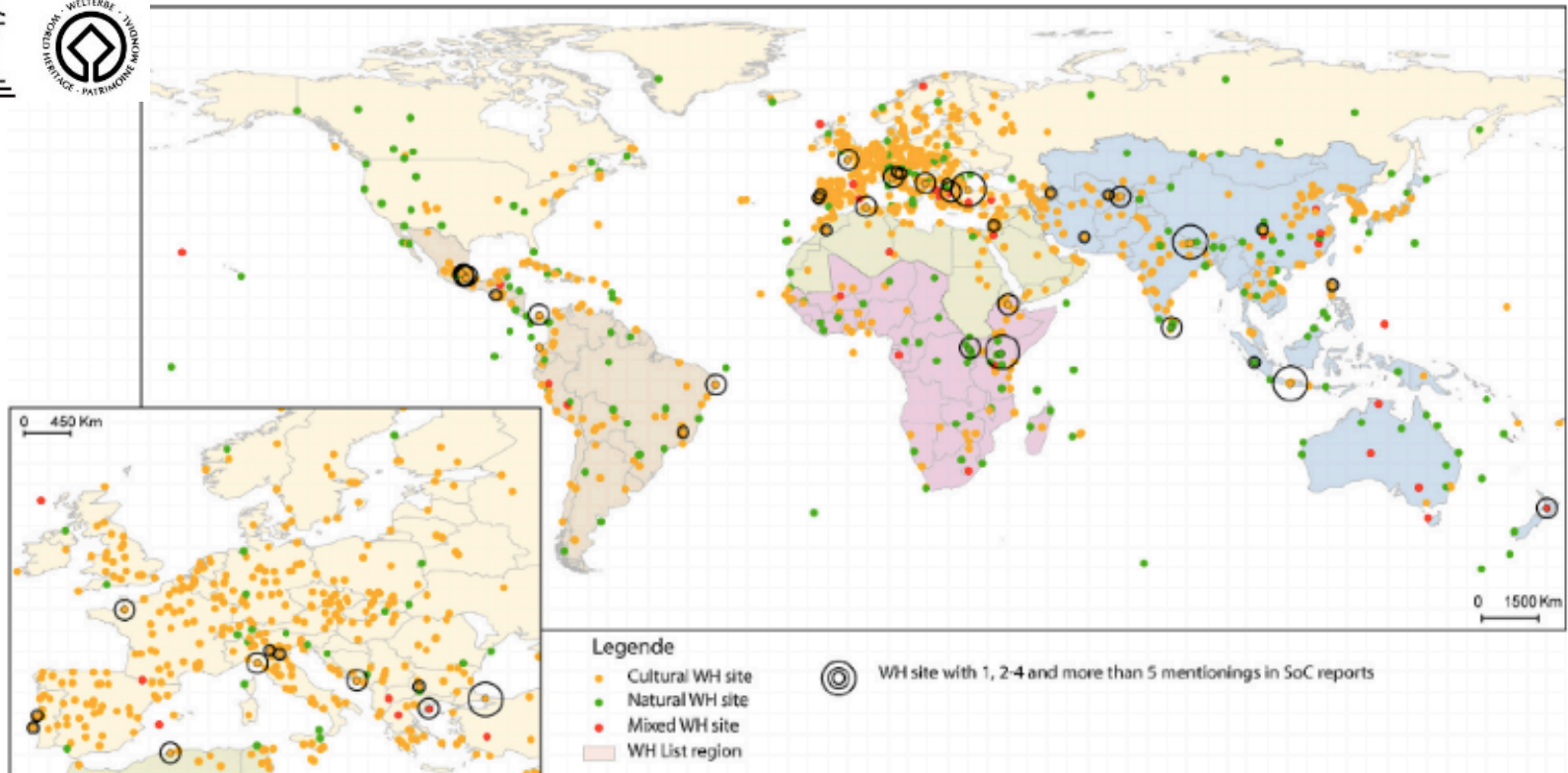
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Risk assessment of UNESCO designated sites



Global overview of the geological hazard exposure and disaster risk awareness at world heritage sites

Pavlova et al., 2016.

Journal of Cultural Heritage



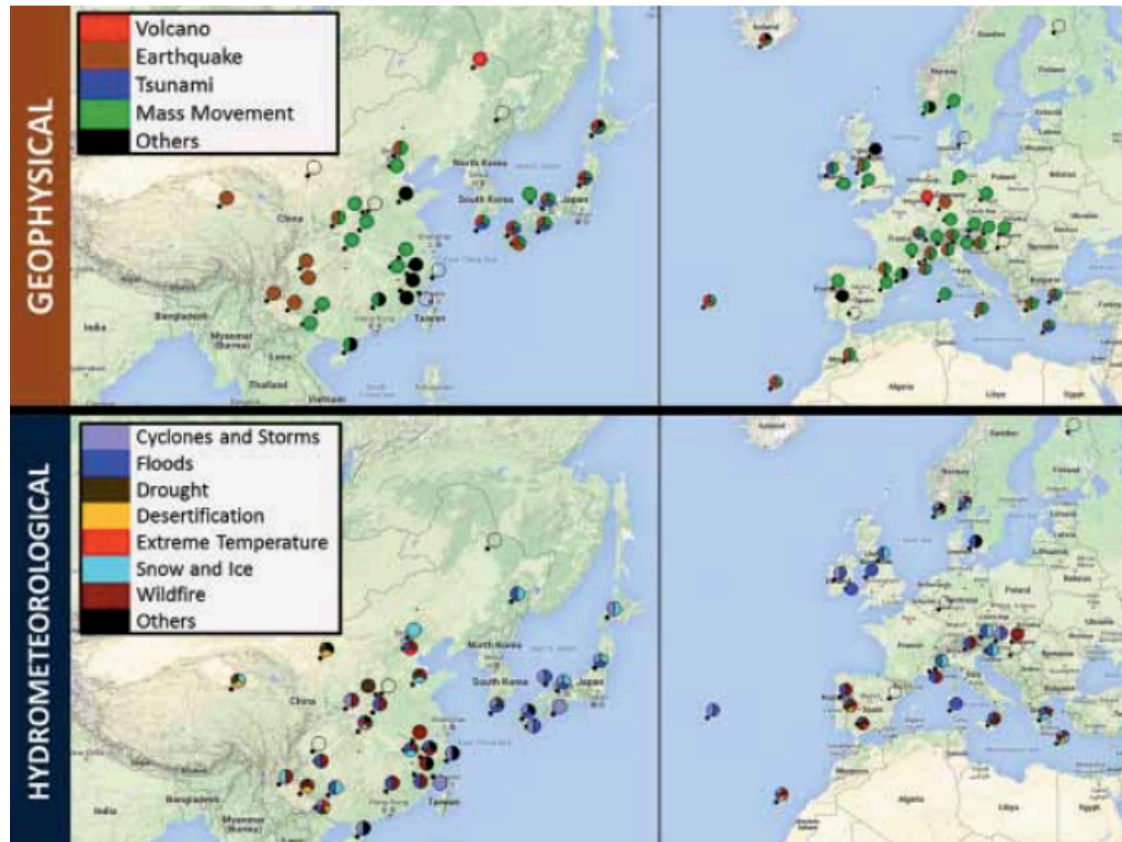
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Risk assessment of UNESCO designated sites



Natural hazards at UNESCO Global Geoparks

Dierickx & Pavlova et al., 2016.

European Geopark journal



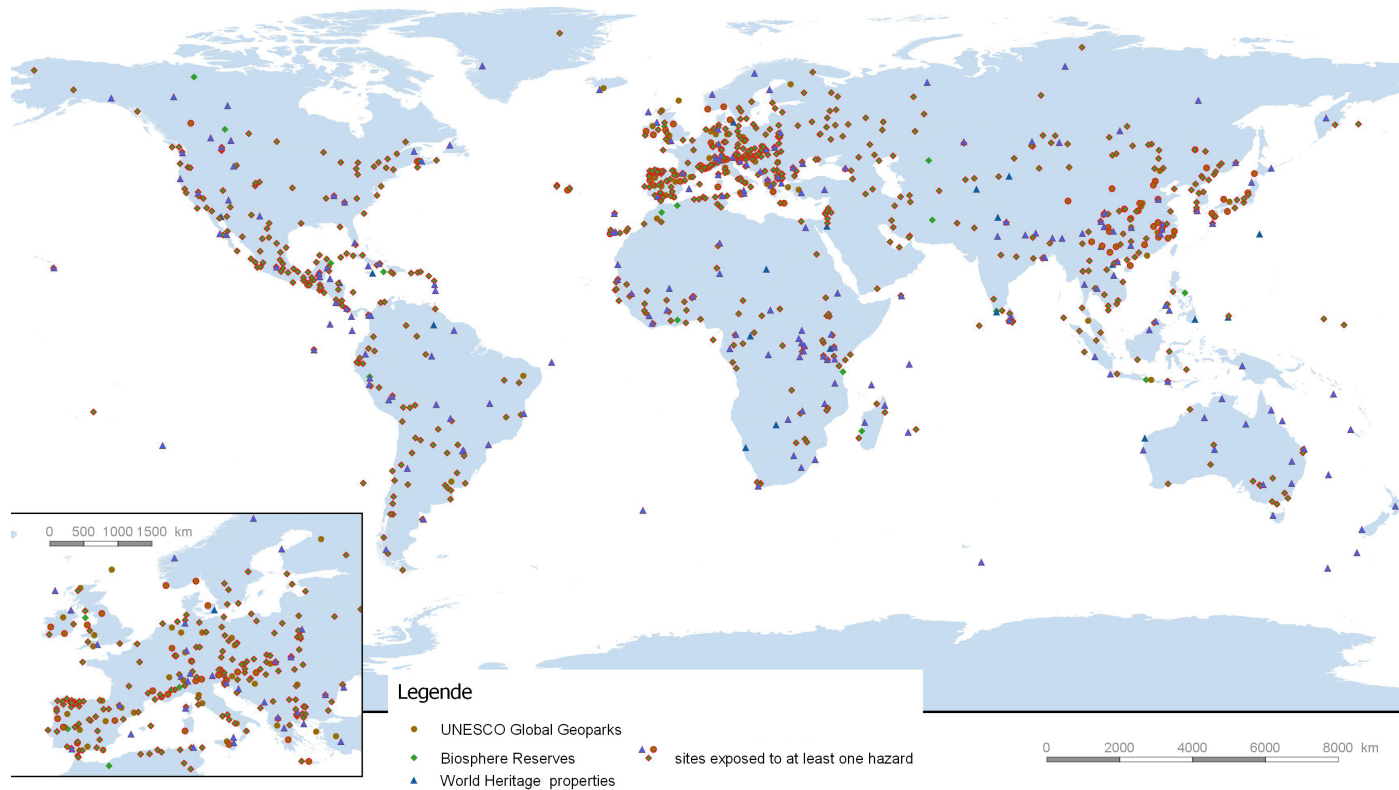
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Risk assessment of UNESCO designated sites



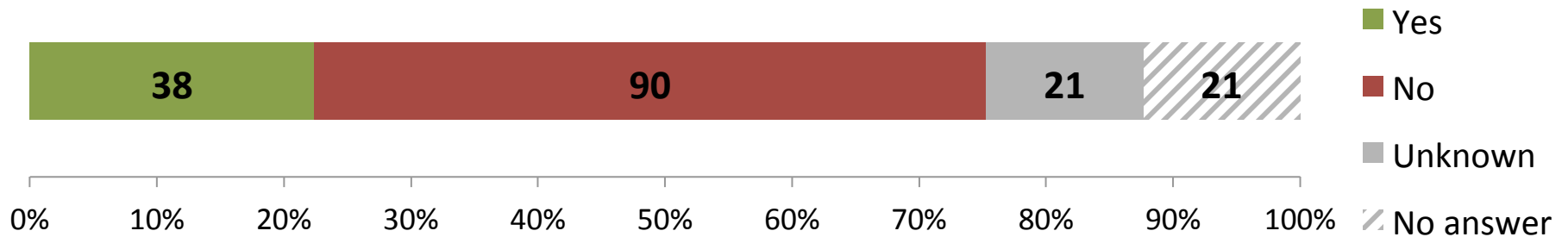
UNESCO designated sites – natural and cultural heritage sites as platforms for awareness raising

Pavlova et al., in revision

Global Assessment Report, UN ISDR

Risk assessment of UNESCO designated sites

Risk Assessment has been carried out in the Biosphere Reserve*



Risk Assessment carried out in the UNESCO Global Geopark*



* based on a survey launched by UNESCO to site managers



Lack of outreach between scientific community and practioners

Disaster Risk management at UNESCO designated sites

Worldwide recognized natural values of coastal systems and biodiversity



Joint management by trilateral cooperation



Protection from severe storms, floods and sea level rise

Mechanism of joint research and monitoring

Upscaling through knowledge sharing: scientific exchange with other countries



Wadden Sea World Heritage
(Denmark, Germany and Netherlands)



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Disaster Risk management at UNESCO designated sites

Traditional land use for
agriculture and landslide
protection



Unregulated development
due to socio-economic
factors



Support on local, national
and international levels

Involvement of multiple
stakeholders

Upscaling through
engagement of multiple
stakeholders:
engagement of all levels

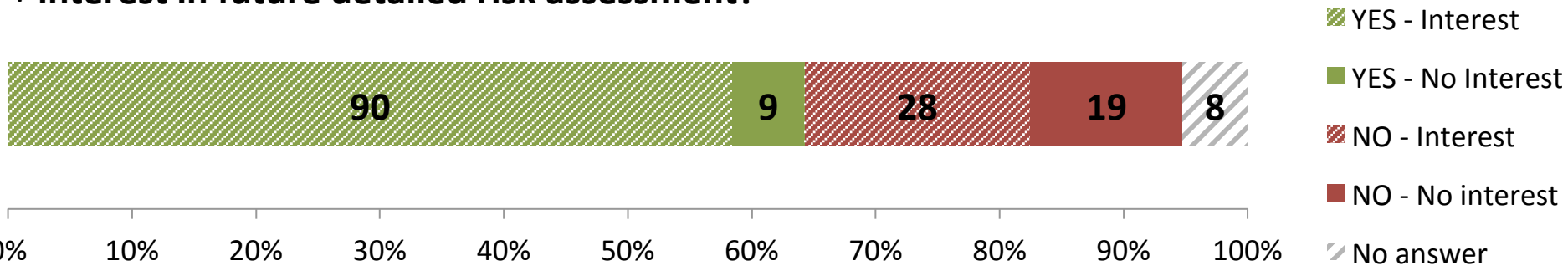


Dong Van Karst geopark (Viet Nam)

Disaster Risk management at UNESCO designated sites

Prevention and Mitigation are integrated in Management Plan

+ interest in future detailed risk assessment?

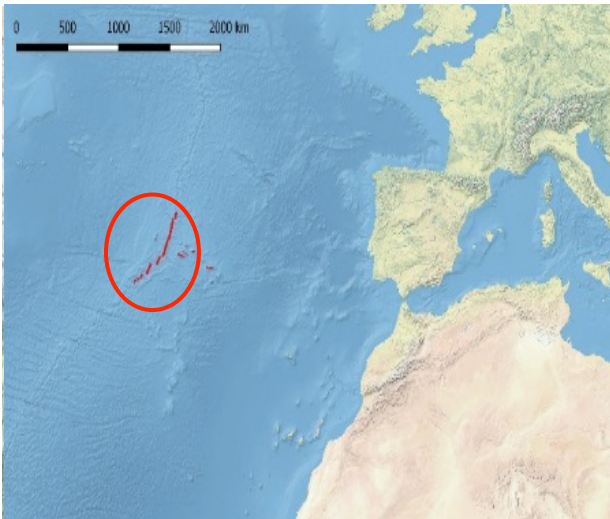


Lack of coordination between DRM national actions and practioners

DRR education & awareness



**Azores UNESCO
Global Geopark**
Azores, Portugal



- Educational materials (flyers, posters, brochures)
- Community engagement
- Workshops / Training
- Campaigns / social media



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DRR education & awareness



**Comarca Minera UNESCO
Global Geopark**
Hidalgo, Mexico



- Educational materials (flyers, posters, brochures)
- Exhibitions / museums
- Centre of Atmospheric Sciences of the National Autonomous University of Mexico



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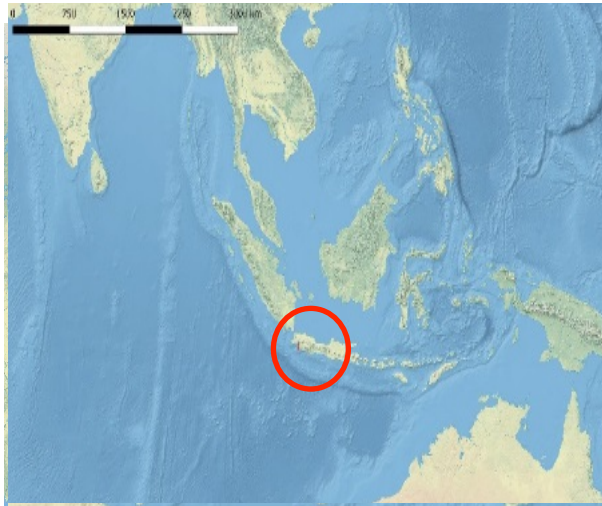
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DRR education & awareness



Ciletuh-Palabuhanratu
UNESCO Global Geopark
Sukabumi, West Java, Indonesia



- Educational materials (flyers, posters, brochures)
- Exhibitions and museums
- Community engagement
- Workshops / Training
- Campaigns / social media
- Evacuation route

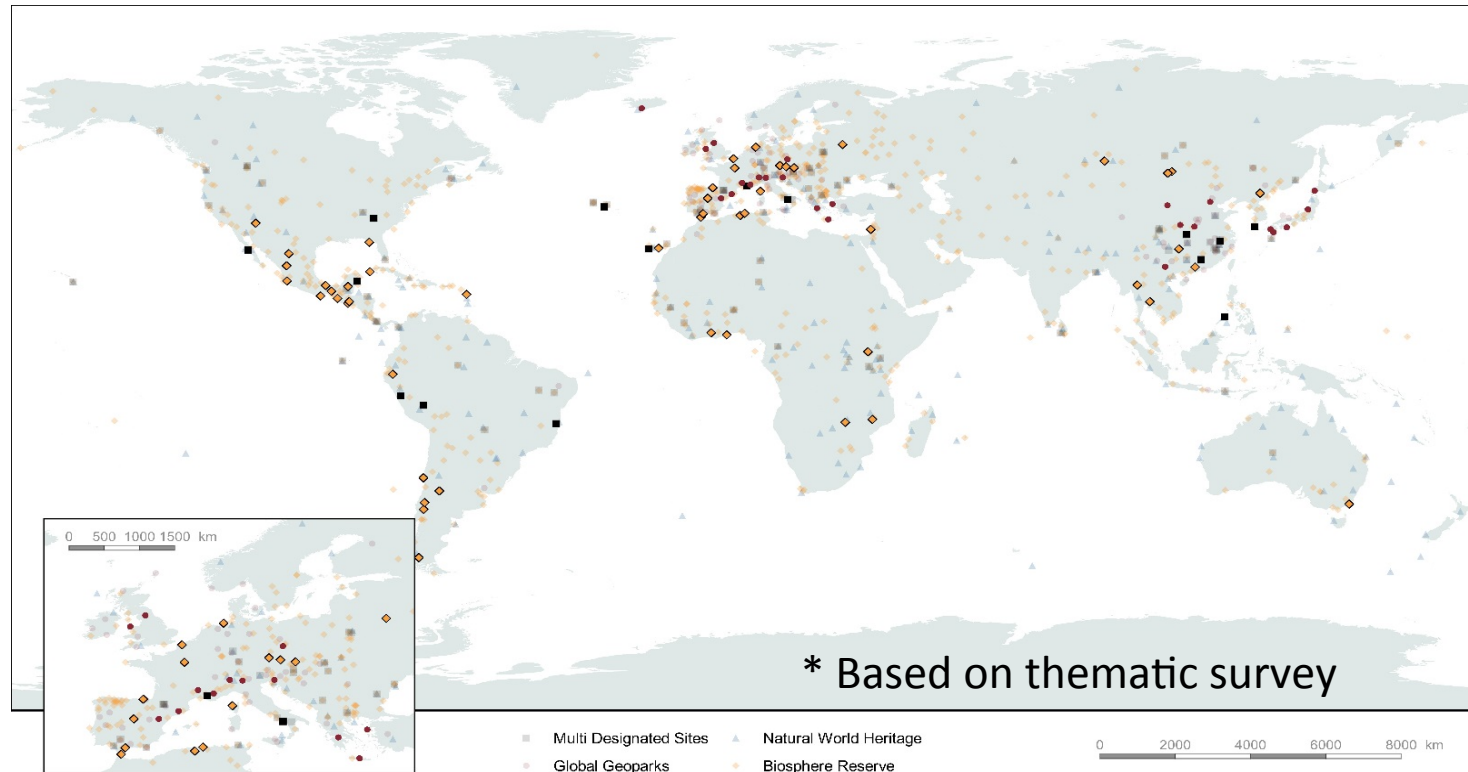


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Good DRM practices at UNESCO designated sites



Lack of knowledge sharing mechanisms

Role of UNESCO in Disaster Risk Reduction



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Role of UNESCO in Disaster Risk Reduction: policy guidance



OUTCOME: Sendai Framework for DRR [2015 – 2030]

Four Priorities of Action

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

Seven Global Goals

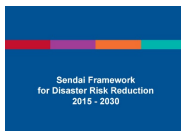
1. Reduce global **disaster mortality**
2. Reduce the number of **affected people**
3. Reduce direct disaster **economic loss** in relation to global gross domestic product
4. Reduce **disaster damage to critical infrastructure and disruption of basic services**
5. Increase the number of countries with **national and local disaster risk reduction strategies**
6. Enhance **international cooperation to developing countries**
7. Increase the availability of and access to **multi-hazard early warning systems and disaster risk information and assessments**

UNESCO's Contribution

UNESCO co-organized 8 sessions at the UN World Conference of Disaster Risk Reduction

- Science and Technology for DRR Decision Making
- Early Warning
- Building Codes
- Risk Identification
- Underlying Risk Factors
- Safe Schools
- **Heritage**
- Education and Knowledge

Role of UNESCO in Disaster Risk Reduction: policy guidance



World Heritage

31 COM

Distribution Limited

WHC-07/31.COM/7.2
Paris, 10 May 2007
Original: English/French

UNITED NATIONS EDUCATIONAL, SCIENTIFIC
AND CULTURAL ORGANIZATION

CONVENTION CONCERNING THE PROTECTION OF
THE WORLD CULTURAL AND NATURAL HERITAGE

World Heritage Committee
Thirty first Session

Christchurch, New Zealand
23 June – 2 July 2007

Item 7.2 of the Provisional Agenda: Issues related to the state of conservation of World Heritage properties: Strategy for Reducing Risks from Disasters at World Heritage properties

SUMMARY

As requested by the Committee through Decision **30 COM 7.2** (Vilnius, 2006), this document contains a revised version of the "*Strategy for Reducing Risks at World Heritage Properties*" (presented in its original version in Document *WHC-06/30.COM/7.2*) with a prioritised list of actions. The Document contains also information on other related activities carried out by the World Heritage Centre and Advisory Bodies since July 2006.

Draft Decision: **31.COM 7.2**, see Point IV



Lima Action Plan as endorsed by the
4th World Congress of Biosphere Reserves on
17 March 2016, and as adopted by the
28th MAB ICC on 19 March 2016, Lima, Peru.

Lima Action Plan for UNESCO's Man and the Biosphere (MAB) Programme and its World Network of Biosphere Reserves (2016-2025)

The Lima Action Plan for UNESCO's Man and the Biosphere (MAB) Programme and its World Network of Biosphere Reserves (2016-2025) contains a comprehensive but succinct set of actions aimed at ensuring the effective implementation of the MAB Strategy 2015-2025, adopted by the MAB ICC at its 27th session (UNESCO, Paris, 8-12 June 2015) and endorsed by the UNESCO General Conference at its 38th session (UNESCO, Paris, 3-18 November 2015).

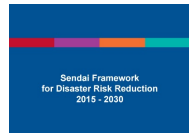
Both the MAB Strategy 2015-2025 and the Lima Action Plan 2016-2025 are founded on the continuity of the Seville Strategy and the Statutory Framework of the World Network of Biosphere Reserves (WNBR) and based on the findings of the evaluation of the implementation of the Madrid Action Plan for Biosphere Reserves (2008-2013).

MAB Strategy 2015-2025

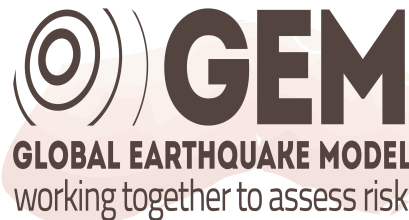
The MAB Strategy foresees that, in the coming 10 years, the MAB Programme will concentrate its support to Member States and stakeholders in conserving biodiversity, restoring and enhancing ecosystem services, and fostering the sustainable use of natural resources; contributing to sustainable, healthy, and equitable societies, economies and thriving human settlements in harmony with the biosphere; facilitating biodiversity and sustainability science, education for sustainable development and capacity building; and supporting mitigation and adaptation to climate change and other aspects of global environmental change.

The MAB Programme will harness lessons learned through sustainability science and education and use modern, open and transparent ways to communicate and share information. A key goal will be to ensure that its World Network of Biosphere Reserves (WNBR) consists of effectively functioning models for sustainable development, by improving governance, collaboration and networking within the MAB and WNBR; by developing effective external partnerships to ensure long-term viability, and by implementing an effective periodic review process so that all members of the network adhere to its standards.

Role of UNESCO in Disaster Risk Reduction: scientific expertise



**Global Alliance for
Disaster Risk Reduction & Resilience
in the Education Sector**





Role of UNESCO in Disaster Risk Reduction: scientific expertise

Work Stream 3 – Capacity Building

Provide science evidence of nature based solutions for DRR



OPERANDUM

OPEn-air laboRAtories for Nature based
solUtions to Manage environmental risks



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No776848.

OPERANDUM



OPERANDUM

Open-air laboratories for Nature based solutions to Manage environmental risks

Based on a concept of **open-air laboratories (OALs)**

OPERANDUM OALs

- **Po Valley (Italy)** – flood, storm, drought
- **Lake Puruvesi (Finland)** – flood
- **Elbe Valley (Germany)** – flood
- **Spercheios River (Greece)** – flood, drought
- **Vögelberg (Austria)** – landslide
- **Catterline (UK)** – flood, landslide, storm
- **Dodder River (Ireland)** – flood
- **Shiyang River Watershed (China)** – land degradation, desertification
- **Hong Kong New territories (China)** – weather extremes, landslides, floods
- **Weany Creek sub-catchment (Australia)** - erosion



Flusslandschaft Elbe



Dublic bay



Delta Po



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OPERANDUM



OPERANDUM

OPCs are laboratories for Nature based solutions to Manage environmental risks



Delta Po Biosphere Reserve, Italy

FOCUS ON:

- Salt intrusion and droughts
- Coastal erosion
- River flooding



The OAL location



The NBS proposed:



The OAL will consist in the experimentation of a naturalistic engineering technology for the constitution of a dune consolidated with biodegradable materials. This opera will be a few hundred meters long and raise the beach height contrasting in this way flooding. A special structure will also trap the sand suspended during sea storms promoting the natural nourishment of the beach.



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OPCs are laboratories for Nature based solutions to Manage environmental risks

FOCUS ON:

- Salt intrusion and droughts
- Coastal erosion
- River flooding



OPERANDUM kick-off meeting, Bologna 3-5 July 2018

OAL Italy on Flooding

Panaro river (tributary of Po river):
flood risk due to severe flood events or embankment failures

High potential risk for riverine inundations due to levee failure.

Emilia-Romagna
Po valley and
Panaro river



Panaro River



Typical embankment enforcement



Existing offline detention basin



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Cooperation on DRR & UNESCO natural designated sites



Increasing consideration of cultural and natural heritage safeguarding in the national DRR strategies



Undertaking a global assessment of UNESCO designated sites' needs and gaps in DRR



Assessing risks in UNESCO designated sites, Disaster Risk Management and awareness raising and improving local strategies for better preparedness



Disseminating good practices and improvements in risk assessment and disaster risk management through UNESCO designated sites in each region



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Cooperation on DRR & UNESCO natural designated sites



Thank you for your attention

i.pavlova@unesco.org



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