

Potential topics:

Ontology and Disasters

**Ontology Summit 2022
Considerations**

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Decisions required



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PREPARATORY WORK**



**READING LIST DOCUMENT
IS A GOOD BASE START**



List contributors: among others - Baclawski, Berg-Cross, Bennett, Miles, Rovutto, Sharma, Shkotin, Singer, Sriram, et. al.

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**READING LIST
DOCUMENT IS A
GOOD BASE START**



READING LIST DOCUMENT IS A GOOD BASE START

Filter by
International Organizations
Domains – types of disaster
Lifecycle - phases or total
Geo-Temporal
Pandemic or No health Disasters

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Filter by

Parameters

Complex Events

Decision Support

Frameworks:

Risk:

Collateral risk

Management

Mitigation

Recovery

Resources (financial and
human)

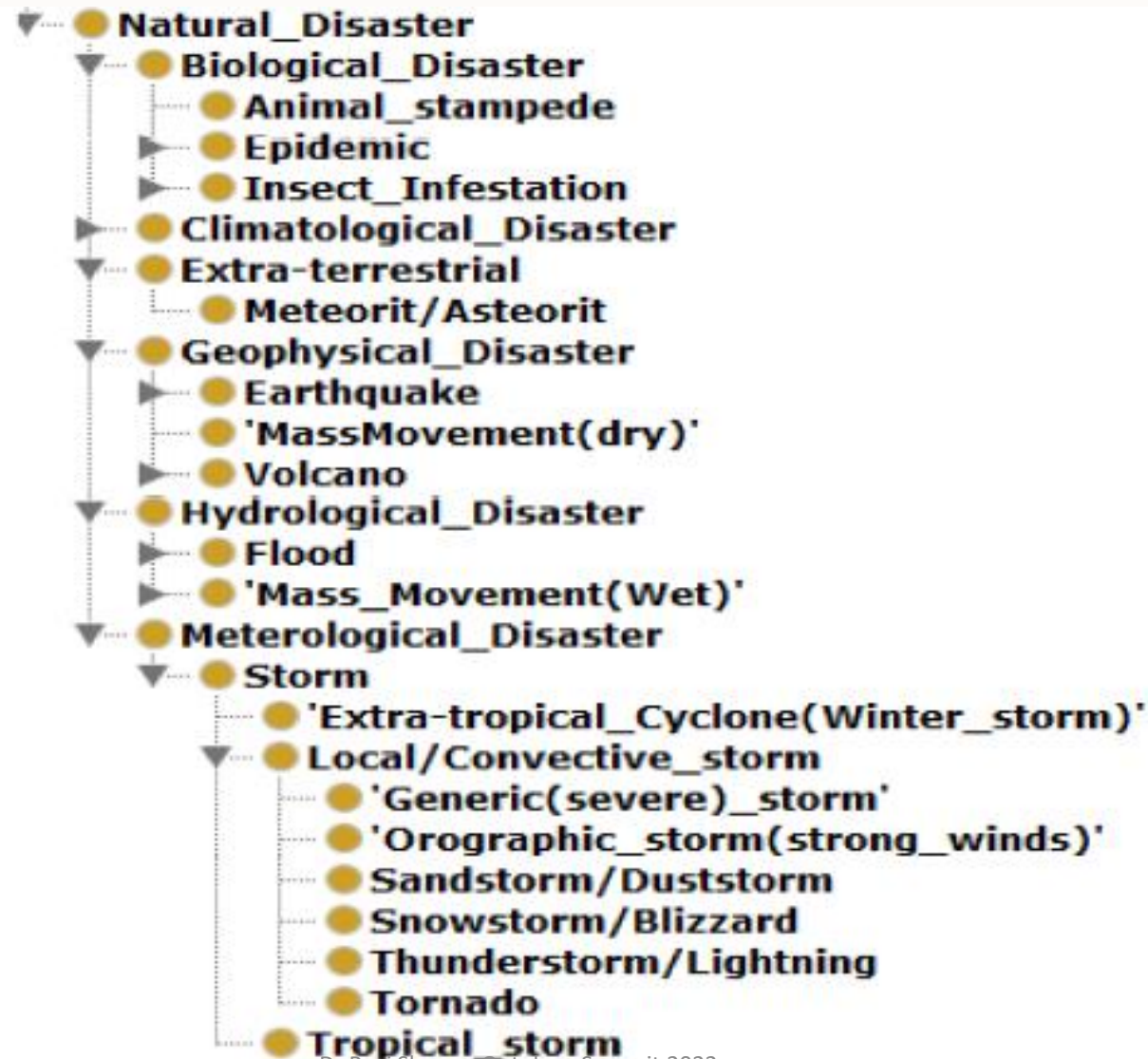
- 2008 Ontology Design for Information Integration in Disaster Management - Babitski ...
- 2014 Disaster Management in ASEAN – SAWADA
- 2014 A TAXONOMY OF THREATS FOR COMPLEX RISK MANAGEMENT - Coburn, A.W.;...
- 2020 Semantic Web in Disaster Management: A Systematic Literature Review IOP Conf. Ser.: Mater. Sci. Eng. 803 012043 Teduh Dirgahayu et al
- 2021 Emergency Management Case-Based Reasoning Systems: A Survey of Recent Developments Walid Bannour
- 2017 Emergency decision making for natural disasters: An overview Lei Zhoua, et al...
- 2021 Implementation of FAIR Principles for Ontologies in the Disaster Domain: A Systematic Literature Review Allan Mazimwe....
- 2016 An Ontology of Natural Disasters with Exceptions Sarika Jain,.....
- Ontology-supported rule-based reasoning for emergency management Sarika Jain ...

Pandemic related

- 2007 Ontology Based Modeling of Pandemic Simulation Scenarios Henrik Erikssona,....
- 2021 CODO: An Ontology for Collection and Analysis of Covid-19 Data - Biswanath Dutta, Michael DeBellis
- UNDRR one sample: Review of COVID-19 Disaster Risk Governance in Asia-Pacific: Towards Multi-Hazard and Multi-Sectoral Disaster Risk Reduction (<https://www.undrr.org/publication/reviewcovid-19-disaster-risk-governance-asiapacific-towards-multi-hazard-and-multi>) ...
- The Covid-19CODODevelopmentProcess:an Agile ApproachtoKnowledgeGraph Development Michael DeBellis and BiswanathDutta EasyChair
- GITHUB CODO - DeBellis

Example: From Ontology of Natural Disasters

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- **Table 1.** Keyword Sets Ontologies in the Disaster Management Domain.

- **keyword set 1: Ontologies**

- Ontology
- ODP (ontology design pattern)
- Vocabulary
- Terminology

- **keyword set 2: Disaster management domain**

- Hazard
- Disaster
- Vulnerability
- Risk
- Crisis
- Humanitarian
- EarlyWarning
- Emergency

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Table 4. Disaster Response Ontologies (Crisis and Humanitarian Domain).

ID	Ontology	Description
P57	beAWARE ontology [37]	Ontology for integrating heterogeneous data in the context of climate crisis management.
P40	Communication and Tracking Ontology [38]	For common understanding of communication and tracking operations by stakeholders in disaster
P28	Disaster-domain-model [39]	Represents interdependencies between resources and needs during crisis management.
P23	Crisis situation ontology [40]	Represents emergency shared situation awareness knowledge for stakeholders in crisis management
P69	CROnto ontology [41]	Represents crisis features, impacts and strategic response plans between stakeholder organisation
P10	Disaster management domain ontology [2]	Provide a unified understanding of knowledge from heterogeneous glossaries in the disaster domain
P36	Disaster management service ontology [42]	Models internal and external information for slope based landslide analysis.
P54	Disaster medical relief ontology [43]	Structure common knowledge for disaster medical relief
P60	Disaster Trail Management (DTM) [44]	Represents knowledge in the earthquake disaster response phase
P81	DOcument-Report-Event Situation (Dores) [45]	Represents information collected about events, crises and representing event and situation reports
P63	Disaster ontology [46]	Defines disaster risk knowledge in the context of mining social media data during disaster and crisis
P3	Domain Ontology for Mass Gathering (DO4MG) [47]	Defines a knowledge model for representing emergency management concepts for mass gathering
P25	Earthquake ontology [48]	Defines concepts in the Earthquake domain for use in disaster management
P76	EDXL_RESCUER [49]	Defines Emergency and Crisis domain knowledge necessary for coordination and exchange of information within legacy systems
P17	Emergency case ontology [50]	Defines earthquake emergency response knowledge for decision support.
P16	Emergency decision ontology [51]	Represents Natural disaster emergency knowledge to support decision making.

ID	Ontology	Description
P57	beAWARE ontology [37]	Ontology for
P40	Communication and Tracking Ontology [38]	For common
P28	Disaster-domain-model [39]	Represents
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P54	Disaster medical relief ontology [43]	Structure co
P60	Disaster Trail Management (DTM) [44]	Represents

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P24	Emergency Response Ontology [55]	Represents emergency situation knowledge in the context of Mobile-based emergency response sy
P56	EmergencyFire ontology [56]	Represents knowledge in fire emergency response situations
P85	Empathi [4]	Provides concepts for integrating emergency management information from various sources such as satellite images, local sensors and social media content
P51	EPISECC Ontology [57]	Spatio-temporal disaster management ontology that defines knowledge to first responders.
P66	GEO-MD ontology [58]	A geographic ontology representing major disaster concepts used in satellite image classification
P47	Geontology meteorological disaster ontology [59]	Formal definition of knowledge for emergency management of meteorological disasters
p43	Humanitarian Aid for Refugees in Emergencies (HARE) [60] ontology	Enables integration of humanitarian aid information from several legacy databases
P29	Humanitarian Assistance Ontology [61]	Represents Humanitarian Crisis knowledge for disaster response.
P74	Humanitarian Exchange Language (HXL) [62]	Vocabulary developed by UNOCHA to improve data management and exchange for disaster resp
P73	Management Of A Crisis (MOAC) vocabulary [63]	Vocabulary for integrating crowd generated content with traditional information extracted from humanitarian assessment reports.
P46	Meteorological disaster ontology (MDO) [64]	Describes components of the meteorological disaster to support emergency management.
P64	Natural Disaster Ontology [65]	Represents disaster knowledge with for semantic extraction of disaster related online articles
P44	Ont-EP4MO [66]	Defines knowledge for emergency management in metro operations
P49	OntoCity [67]	Incorporates refactoring of the spatial relations for reasoning upon imagery data for disaster management
P38	OntoEmerge ontology [68]	Defines emergency planning knowledge
P11	OntoFire ontology [69]	Wildfires ontology for enriching of data to enable search and retrieval from the ontofire Geoportal
P83	Ontology for climate crisis management [70],	Represents knowledge about mission assignments to first responder units during a climate crisis c
P61	Ontology for flood fore casting [71]	Captures flood response knowledge for shared understanding among flood response stakeholders

EPISECC Ontology [57]	Spatio-temporal disaster man
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Natural Disaster Ontology [65]	Represents disaster knowled
Ontology for Emergency [66]	Describes the structure of

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From the List it is clear that:

Ontologies have been used although sparse, in disaster situations

However, the variety and purpose are heterogeneous and range from Classification to Management.

Forecast and Prediction can have Probabilistic Risks and Models - these lead to analysis similar to financial risks. Often what is called risk reduction is implied for minimization of losses.

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Filter Disaster topics by selecting from

- Earth Science / Earth Resources:
- Human made Disasters: Population, Energy needs, Habitat - Cities
- Health and diseases
 - Include Pandemics or total CBRNE?

From the List it is clear that:

One has to do a deeper dive into what Agencies such as the UN and the US FEMA, and ASEAN are doing for types of natural and human-made disasters, but agency work itself is not sufficient for the Summit.

After studying names of contributors to Ontology papers a list of speakers can be created for their areas of study. For example, Michael DeBellis, coauthor Biswanath Dutta and others such as Jain et al are working on Pandemic semantic aspects.

At this stage a picture will emerge on selection of

Tracks
Topics
Speakers

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