

Supplement of Nat. Hazards Earth Syst. Sci., 20, 2503–2519, 2020  
<https://doi.org/10.5194/nhess-20-2503-2020-supplement>  
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*Supplement of*

## **The object-specific flood damage database HOWAS 21**

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**Table S1.** Examples of natural hazard damage databases providing information on flood impacts. This list of databases is not exhaustive.

Database	Holder institution	Spatial coverage	Spatial resolution	Temporal coverage	Recording thresholds	Data sources	Accessibility	Description / reference	URL
AJDA	Administration of the Republic of Slovenia for Civil Protection and Disasters Relief (ACPDRL)	National (Slovenia)	National, regional, municipal	2003 - present	Incorporation of damage to crops and property when the level of damage exceeds 0.03% of the national budget	Civil protection offices, environmental agencies, scientific institutions, auditors, insurance companies	No public access	Rudari et al., 2017	-
ADRC	Asian Disaster Reduction Center (ADRC)	Continental (Asia)	National, regional, municipal	1998 – present	Not defined	UN agencies, Reuters and international news agencies (AFP, BBC, CNN), NGOs (IFRC, Catholic Relief Services)	Open access	Tschoegl et al., 2006	<a href="https://www.adrc.asia/latest_disaster.php">https://www.adrc.asia/latest_disaster.php</a>
Canadian Disaster Database	Office of Critical Infrastructure Protection and Emergency Preparedness (OCIEPEP)	National (Canada + global regions, where Canadian citizens were involved)	National, regional, municipal	1900 – present	>10 fatalities, >100 people affected, declaration of state of emergency, historical significance, significant damage/interruption	Press media, government, provincial emergency management organizations, municipal government, Insurance Bureau of Canada, NGOs	Open access	Tschoegl et al., 2006	<a href="http://cddl.publicsafety.gc.ca/srchpg-eng.aspx?dynamic=false">http://cddl.publicsafety.gc.ca/srchpg-eng.aspx?dynamic=false</a>
DesInventar	United Nations Office for Disaster Risk Reduction (UNISDR)	Global	National	1994 - present	Casualties or damage	NGOs, governmental institutions, civil protection agencies	Open access	Rudari et al., 2017	<a href="https://www.desinventar.net/Desinventar/main.jsp?countrycode=gl5">https://www.desinventar.net/Desinventar/main.jsp?countrycode=gl5</a>

**Table S1.** Examples of natural hazard damage databases providing information on flood impacts (continuation). This list of databases is not exhaustive.

Database	Holder institution	Spatial coverage	Spatial resolution	Temporal coverage	Recording thresholds	Data sources	Accessibility	Description / reference	URL
DSWD-DROMIC	Department of Social Welfare and Development (DWSO), Government of Philippines	National (Philippines)	Regional, municipal, city	2006 - present	Not defined	DSWD field offices, NGOs, media	Open access	Tschoegl et al., 2006	<a href="https://dromic.dswd.gov.ph/">https://dromic.dswd.gov.ph/</a>
EMA Disasters Database	Emergency Management Australia, Australian government	National (Australia)	Administrative regions	1622 – present	≥ 3 fatalities, 20 injured or ill and/or significant damage to property, infrastructure, agriculture or environment	Government, Insurance Council of Australia, emergency service agencies, research bodies, educational institutions, press media	Open access	Tschoegl et al., 2006	<a href="https://knowledge.aidr.org.au/collections/australian-disasters/">https://knowledge.aidr.org.au/collections/australian-disasters/</a>
EM-DAT	CRED, Université Catholique de Louvain, Brussels	Global	National	1900 – present	>10 fatalities, >100 people affected, declaration of state of emergency	UN agencies, government organizations, Red Cross and Red Crescent Societies	Open access	Kron et al., 2012; Rudari et al., 2017	<a href="https://www.emdat.be/">https://www.emdat.be/</a>
Flood Hazard Research Centre (FHRC) damage database	Flood Hazard Research Centre (FHRC), Middlesex University, UK	National	Single element at risk	1977 - present	Not defined	Mainly synthetic data generated by expert judgement; But also empirical data collected from: on-site expert surveys, insurance companies, government, other databases	Access upon payment	Penning-Rowse et al., 2013	-

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Database	Holder institution	Spatial coverage	Spatial resolution	Temporal coverage	Recording thresholds	Data sources	Accessibility	Description / reference	URL
GLIDE	Asian Disaster Reduction Center (ADRC)	Global	National, regional, municipal	1930 – present	Not defined	Official organizations, partners, news, publications	Open access	Tschoegl et al., 2006; Rudari et al., 2017	<a href="http://www.glide-number.net">http://www.glide-number.net</a>
Global Active Archive of Large Flood Events	Dartmouth Flood Observatory	Global	States, provinces, counties, towns, cities	1985 – present	Large floods	News, government, instrumental, remote sensing	Open Access	Bubeck and Kreibich, 2011; Brakenridge, 2017	<a href="http://floodobservatory.colorado.edu/Archives/index.html">http://floodobservatory.colorado.edu/Archives/index.html</a>
HANZE - Historical Analysis of Natural Hazards in Europe	TU Delft, Department of Hydraulic Engineering	Continental (Europe)	Regional (NUTS3)	1870 – 2016	Available statistics on either area flooded, fatalities, persons affected, or monetary damage	Publications and databases	Open access	Paprotny et al., 2018	<a href="https://data.4tu.nl/repository/collect ion:HANZE">https://data.4tu.nl/repository/collect ion:HANZE</a>
HOWAS21	German Research Centre for Geosciences GFZ	National (Germany)	Single element at risk	1978 - present	information about the economic sector + the monetary damage + the inundation depth + the flood event + the location	On-site expert surveys, telephone interviews, insurance companies, local government	Limited access to the public; Full access to registered users	Kreibich et al., 2017; Kellermann et al. 2020	<a href="http://howas21.gfz-potsdam.de/howas21/">http://howas21.gfz-potsdam.de/howas21/</a>
MANDISA Database	University of Cape Town (DIMP)	Local (Cape Town Metropolitan Area)	Single element at risk	1990 - 2004	Large-, medium-, and small-sized disasters and incidents	Reports from fire services, disaster management agencies, NGOs	No public access	Tschoegl et al., 2006	-

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Database	Holder institution	Spatial coverage	Spatial resolution	Temporal coverage	Recording thresholds	Data sources	Accessibility	Description / reference	URL
NatCatSERVICE	Munich RE	Global	National	1974 – present	Property damage and/or person affected	Lloyd's, Reuters, reports from clients and branch offices, insurance press	Limited access to public (maps, reports, predefined analyses), extended services to clients	Kron et al., 2012; Rudari et al., 2017	<a href="https://natcatservice.munichre.com/">https://natcatservice.munichre.com/</a>
National Hazard Statistics	National Weather Service (NOAA), USA	National	States	1995 – present	Information about fatalities, injuries and/or damages	NOAA's Storm Data reports	Open access	Tschoegl et al., 2006	<a href="http://www.nws.noaa.gov/om/hazstats.shtml">http://www.nws.noaa.gov/om/hazstats.shtml</a>
NDCC Database	National Disaster Coordination Council (NDCC)	National (Philippines)	Regional	1990 – present	Not defined	Office of Civil Defense, Office of Social Welfare, local planning development offices, local emergency management offices	Open access	Tschoegl et al., 2006	<a href="http://ndrrmc.gov.ph/">http://ndrrmc.gov.ph/</a>
ÖBB damage database	Austrian Federal Railways (ÖBB)	National (Austria)	Single element at risk	2000 - present	Railway operation incident, damage to railway infrastructure	ÖBB Natural Hazards Management Department	No public access	Moran et al., 2010; Kellermann et al., 2016	-
SHELDUS	University of South Carolina, USA	National (United States of America)	County, State	1960 – present	Fatalities and/or monetary loss	National Climatic Data Center, National Center on Environmental Information, United States Geological Survey, US Census Bureau, US Bureau of Labor Statistics	Open access by subscription	Rudari et al., 2017; CEMHS, 2018	<a href="https://cemhs.asu.edu/sheldus/">https://cemhs.asu.edu/sheldus/</a>

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Database	Holder institution	Spatial coverage	Spatial resolution	Temporal coverage	Recording thresholds	Data sources	Accessibility	Description / reference	URL
Sigma	Swiss Reinsurance Company (SwissRe)	Global	National	1970 – present	20 deaths and/or 50 injured and/or 2,000 homeless and/or > 35 Mio. US\$	Newspapers, Lloyds, insurance and reinsurance periodicals, internal reports, and online databases	Limited access to public	Pfurtscheller et al., 2011, Rudari et al., 2017	<a href="http://www.sigma-a-explorer.com">http://www.sigma-a-explorer.com</a>
StonMe	Swiss Federal Office for the Environment (BAFU)	National (Switzerland)	Canton	1996 - present	Injured or dead people, traffic incidents, infrastructure damage > 10,000 SFr	Historical maps and archives, road construction and railway companies	No public access	Pfurtscheller et al., 2011	<a href="https://www.bafu.admin.ch/">https://www.bafu.admin.ch/</a>
Swiss flood and landslide damage database	Swiss Federal Institute for Forest, Snow and Landscape Research (WSL)	National (Switzerland)	Municipality	1972 - present	Damage causing floods, mass movements and debris flows	Press articles, official information from the Swiss cantons, insurance companies	No public access	Hilker et al., 2009; Pfurtscheller et al., 2011	<a href="https://www.wsl.ch/en/natural-hazards/understanding-and-forecasting-floods/flood-and-landslide-damage-database.html">https://www.wsl.ch/en/natural-hazards/understanding-and-forecasting-floods/flood-and-landslide-damage-database.html</a>
WLK – The Austrian Torrent and Avalanche Cadastre	Austrian Service for Torrent and Avalanche Control (WLV)	National (Austria)	Single element at risk	unclear - present	Not defined	On-site surveys and reports of in-house experts	No public access	Pfurtscheller et al., 2011; PLANALP, 2013	<a href="https://naturgefahren.die-wildbach.at/V3/index.aspx">https://naturgefahren.die-wildbach.at/V3/index.aspx</a>

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