StartClim2017

The Paris Agreement and the Sustainable Development Goals: Austria-Related Aspects

Final Report

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Institute of Meteorology
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Contracting Parties

Austrian Federal Ministry for Sustainability and Tourism
Austrian Federal Ministry of Education, Science and Research
Federal State of Upper Austria
Federal Environment Agency

Administrative Coordination

Federal Environment Agency

Vienna, December 2018

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StartClim2017.B: Multiscale evaluation of damage caused by extreme weather situations
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StartClim2017.C: EXTEND (EXTreme EveNts Documentation) documentation of the physical and social consequences of extreme events
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StartClim2017.D: Monitoring of alien mosquitoes of the genus *Aedes* in Austria
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Austrian Federal Ministry of Education, Science and Research
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Federal State of Upper Austria
Federal Environment Agency

Administrative Project Coordination

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Abstract

StartClim has been studying the topic of adaptation to climate change since 2008. The projects in StartClim2017 addressed various research questions and provided scientific support for implementation of the Austrian Adaptation Strategy. The first projects dealt with the Paris Agreement and its effects on the Austrian development industry, two projects focused on extreme weather events, and one project researched invasive species in Austria.

Besides the importance for the Austrian economy, the building and real estate industries and their products (buildings and infrastructure) have a wide-ranging and enduring impact on the climate and environment. Because of the extended building and refurbishment cycles of at least thirty years, investments have a very long-term effect. The first StartClim project was designed to demonstrate the motivational approaches and regulatory measures available for the domestic building and real estate industries to make them sustainably “climate-friendly” and to achieve the Paris climate goals. Based on fourteen qualitative expert interviews with decision-makers from twelve representative companies from the areas of property development, construction, building consultancy and building product manufacture and a concluding expert workshop, the framework conditions for climate-friendly building in Austria were described and seven future-oriented approaches identified with the necessary measures for their implementation. Awareness of climate protection measures is low in the Austrian domestic building and real estate industries. In contrast to the widely held opinion, climate-friendly construction is not the most important cost factor. The cost of parking spaces and possibly overly stringent technical requirements (such as fire protection) far exceed the costs of climate protection investments. Successful implementation of the Paris objectives requires, among other things, the greening of the tax system, the abolition of tax advantages for fossil fuels, the embedding of climate protection in rent law, for example by means of energy contracting and measures to increase the awareness by the end consumer of climate protection measures.

The StartClim2017.B – The SEVERE project investigated the importance of small-scale heavy precipitation as a trigger of natural hazards. Information was collected on the conditions under which natural hazards such as mudflows, landslides or flash floods can be triggered by precipitation. For this purpose, discussions were held with experts from the fields of hydrology, geomorphology, geology and meteorology, and the current state of research in the literature was reviewed. In addition, documented damage events as a result of weather effects from the ZAMG VIOLA database together with high-resolution precipitation data from the SPARTACUS dataset were statistically evaluated. This evaluation served as a basis for information on the extent to which event precipitation alone allows reliable statements about precipitation-related natural hazard risks. The statistical evaluation, expert discussions and literature review showed that the physical processes that lead to natural hazards are very complex, and, in addition to precipitation, a number of other local drivers are responsible for precipitation-related damage. Furthermore, procedures must be developed that allow a more precise assessment of the duration and intensity of event precipitation, as individual precipitation datasets, for example on a daily basis, cannot yet provide sufficient information for small-scale events. On the basis of these findings, concepts for continuing research projects in a cross-disciplinary project consortium were developed.

Climate change is expected to alter the frequency, intensity and seasonality of extreme weather events, affecting both natural hazard impact and current mitigation strategies. This change, in combination with socio-economic changes in mountain areas, poses new challenges to decision-makers and stakeholders regarding disaster risk management (e.g. affected communities, government, authorities and scientists). Systematic event

documentation and the use of information on disaster impact will improve preparedness for an effective response.

The EXTEND project reviewed existing standardised methods of post-event analysis of extreme precipitation in Austria and identified the institutions responsible e.g. local authorities, insurance companies, infrastructure providers, research institutes and emergency services (fire brigade, Red Cross). The review was extended to other German-speaking countries in the Alpine region (Switzerland, Germany and Italy), making it possible to identify the following main motivations for data collection: compensation for financial loss, damage statistics, in-depth understanding of trends, processes or meteorology, knowledge for planning processes (hazard maps, mitigation measures) and detailed documentation of disaster-relief operations. However, the consequences of natural hazards are also influenced by social aspects, e.g. age, gender, income or social networks of the affected society. These aspects affect the resilience of a community and the ability and time needed to recover after an event. Based on international good practice examples, the importance and added value of these aspects were highlighted in the project. A proposal for a form sheet including the documentation of social aspects was developed to improve event documentation, especially after flood events in Austria.

In the summer of 2017, the StarClim2017.D project monitored the oviposition of alien mosquito species of the genus *Aedes* in five Austrian districts, namely Carinthia, Vienna, Lower Austria, Styria and Burgenland. The project used “ovitraps” placed in parks and other government areas in connection with ongoing mosquito surveillance studies, but also in private gardens by participating citizen scientists. Eggs of the Asian tiger mosquito (*Ae. albopictus*), an important vector for arboviruses, were not found in any of the examined provinces, while eggs of the Japanese bush mosquito (*Ae. japonicus*) were found in Lower Austria, Styria and Burgenland. In Vienna and Carinthia, all traps were negative for *Aedes* eggs. This project demonstrated the benefits of involving citizen scientists in mosquito surveillance studies using ovitraps.

1 The StartClim research programme

The StartClim climate research programme is a flexible instrument. Because of the short project duration and annual allocation of project topics, it can react quickly to topical aspects of climate and climate change. It is financed by a donor consortium currently consisting of nine institutions:

- Federal Ministry of Agriculture, Forestry, Environment and Water Management (since 2003)
- Federal Ministry of Health (2005, 2006, 2007)
- Federal Ministry of Science, Research and Economic Affairs (since 2003)
- Province of Upper Austria (since 2012)
- Austrian Federal Forests (since 2008)
- Oesterreichische Nationalbank (2003, 2004)
- Austrian Hail Insurance (2003, 2004, 2006, 2007, 2008)
- Federal Environment Agency (2003)
- Verbund AG (2004, 2007)

StartClim has been studying adaptation to climate change since 2008. Since StartClim2012, the programme's objective has been to deliver scientific contributions to the implementation of the Austrian National Adaptation Strategy.

The four StartClim2017 projects examined different aspects of relevance to climate change adaptation in Austria. The topics explored were:

- The Paris Agreement and its effect on the local development industry
- The evaluation of damage caused by extreme weather events
- The documentation of physical and social aspects of extreme weather events
- The monitoring of an invasive species of mosquitoes

The StartClim2017 report consists of an overview in German and English of the results along with separate documentation containing detailed descriptions of the individual projects by the respective project teams. All StartClim2017 reports and documents will be available for download on the StartClim website (www.startclim.at). Furthermore, a limited number of folders containing a short summary of the results will also be made available.

2 StartClim2017.A: ClimBau – the Paris Agreement and its effects on the domestic building and real estate industries

The building and real estate industries play an important role in the Austrian economy, in terms of contribution to GDP, employment, and direct and indirect environmental impact. Around 6.5 per cent of the GDP and 7 per cent of employees (Statistics Austria 2015) are connected with construction. If the building materials industry (including construction logistics) and the real estate industry are included, this percentage increases considerably.

In addition to the economic importance of the building and real estate industries, the "goods" produced and used by them (buildings, infrastructures) have a major impact on the climate and the environment as a whole. Because of the extended real estate and refurbishment cycles of at least thirty years, investments have a very long-term effect.

The Paris Agreement for the protection of the climate calls on industrialised countries (and therefore also Austria) to extensively abandon the use of fossil fuels and reduce their greenhouse gas emissions by at least 80 per cent (relative to 2005) by the middle of this century.

In order to guarantee the future and competitiveness of the building and real estate industries, the direct and indirect impact of climate change as well as the regulatory requirements for climate protection in the meaning of the Paris Agreement must be transparently embedded in corporate planning and decision-making processes.

Based on fourteen qualitative expert interviews with decision-makers from twelve representative companies from the areas of property development, construction, building consultancy and building product manufacture and a concluding expert workshop, the framework conditions for climate-friendly building in Austria were described and seven future-oriented approaches identified with the necessary measures for their implementation.

The most relevant physical impact of climate change on the building and real estate industries is the increase in heat load and the intensity of small-scale heavy precipitation. These changes affect the construction time (heat stress of the construction workers, protection of the construction sites against precipitation erosion and flooding, displacement of the construction season, etc.) and the building engineering (shading, cooling, dimensioning of the drainage systems, etc.). Figure 1 shows the increase in heat days (T_{max}> 30° C), and hence the heat load, observed in Vienna.

The study showed that awareness of climate protection measures in the domestic building and real estate industries is low. In contrast to the widely held opinion, climate-friendly building is not the main cost factor. The costs of parking spaces and possibly overly stringent technical conditions (such as fire protection) far exceed the cost of investing in climate change protection measures.

According to experts, economic and political incentives are currently missing. The introduction of a carbon dioxide tax, the early depreciation of climate protection investments or the tax advantage of "ecological social" real estate funds could send an important signal. Increased support for thermal renovation, the removal of barriers to energy exchange among private citizens and the end of subsidy policies for fossil fuels could also be useful.

Climate-protection-oriented spatial planning was regarded as very important. However, this can only be successful if the influence of local political self-interest is significantly reduced and planning is carried out on a wider regional basis. To counteract further urban sprawl, the revitalisation of town centres is also required.

Not only the planning and erection phase but also the operation, cyclic renovation work and demolition or disposal of individual parts of buildings or entire buildings need to be considered. According to the study participants, a suitable demolition concept should be devised and the recyclability of the building materials taken into account during planning and construction.

A "*high but less tech*" construction principle is preferred. This is understood as the integration of technology into the building engineering itself (e.g., component activation for space heating and cooling) rather than the "equipping" of buildings with lots of technology. This energy-efficient design requires less technology to control and has a lower investment requirement and thus reduced susceptibility to failure and fewer maintenance requirements than high-tech buildings.

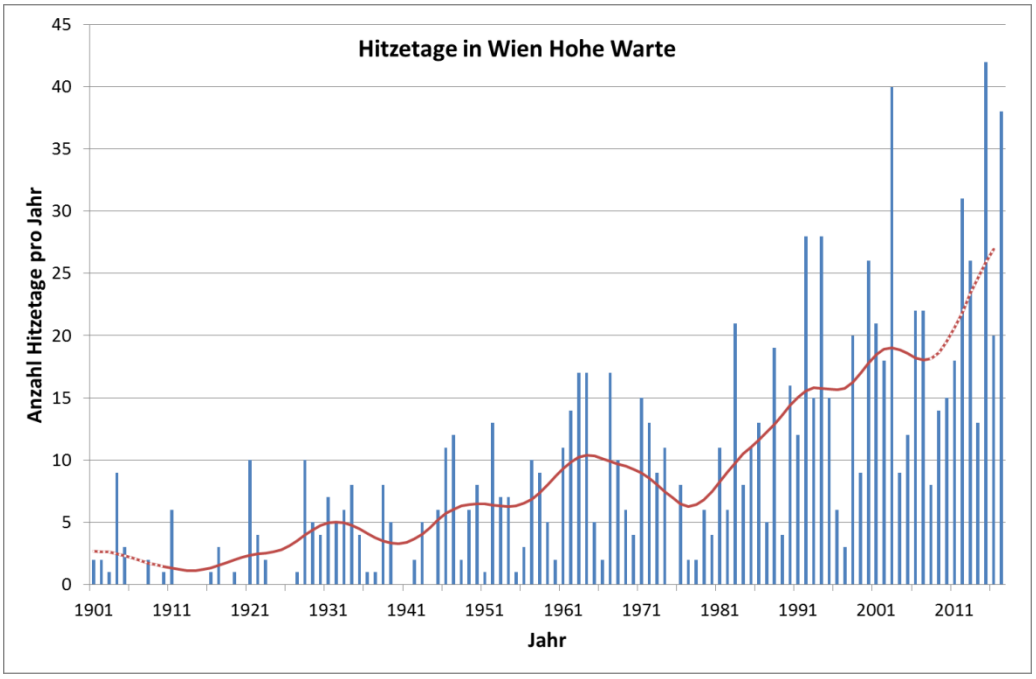

Fig. 1: Number of heat days (T_{max}> 30° C) per year at Vienna Hohe Warte (single years are bars, 20 years smoothing line). While in the first half of the 20th century there were about 5 heat days per year on average, in the second half the number increased to more than 10. In the 21st century the mean is already about 20 days and in extreme years about 40 heat days were registered (data source ZAMG).

3 StartClim2017.B: Multiscale evaluation of damage caused by extreme weather situations

Reports of damage due to extreme weather conditions can be found almost daily in the media, especially during the summer season. One reason for this is the sometimes violent thunderstorms that are typical of this season. They can often cause devastation in small areas within a short time. Because of their frequency, the degree of damage is high, and this strongly affects living conditions. The IPCC report studies noted this and claimed that the intensity of heavy rainfall events might even increase in the future changing climate. That is why weather- and climate-related extreme events are a focus of Austrian adaptation strategies.

In order to estimate the risk of small-scale heavy precipitation and its consequences and to react with appropriate measures, precise knowledge is needed of the influence of the general weather situation on the formation of precipitation and of the resulting natural hazards, such as landslides or flooding, and the occurrence and intensity of such events and their impact. The SEVERE project was designed to provide a knowledge base and to develop strategies for the realistic and application-oriented investigation of these processes. For small-scale extreme events in particular, the only studies available often focus on isolated cases. Additionally, the underlying database for the investigation of these cases is often incomplete or not detailed enough to describe the different risk factors sufficiently.

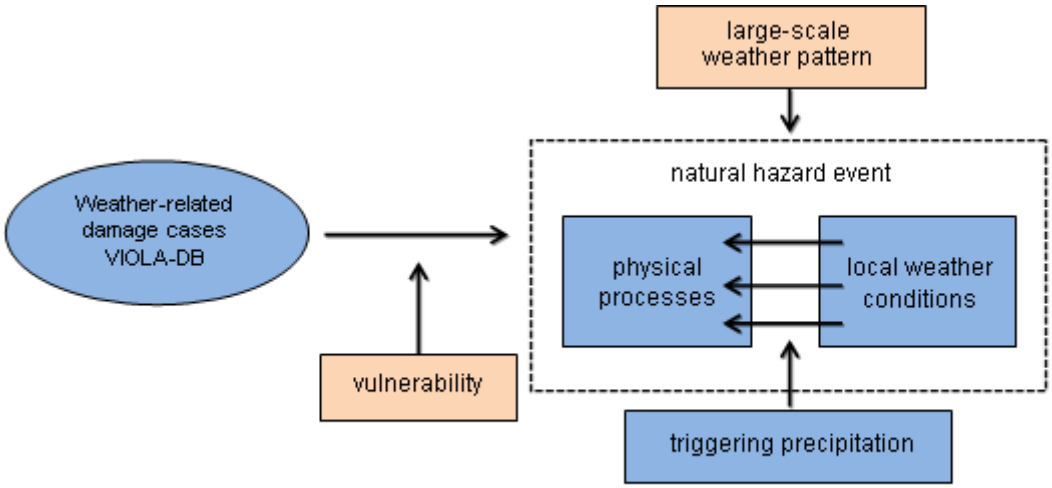

Fig. 2: Schematic illustration of the results of the research project

Fig. 2 provides an overview of the approach chosen to achieve the project objective. Based on documented weather-related claims from the VIOLA database, the rainfall that led to these events was examined (fields highlighted in blue). For the communities concerned, precipitation data was extracted and correlated with precipitation climatology.

In many cases, it was found that the precipitation triggering the documented natural hazard event was actually also a climatologically extreme event. However, this was not the case in about 50 per cent of cases. In consequence, the relationship between the precipitation and the triggering of floods and landslides is very complex and cannot be described by simple statistics.

In order to develop a meaningful strategy for further research projects, discussions were held with experts from the fields of hydrology, geology and natural hazards research. The resulting information was supplemented by a literature study.

Another problem identified in the evaluation was the detection of extreme precipitation itself. In some cases, a documented event could be clearly assigned by location and time on the basis of media reports, whereas the observed precipitation was strikingly low. An example of this is the thunderstorm with heavy rain and hail in the area of Kleinarl/Wagrain on 8 June 2003, which, according to the damage documentation, caused a high torrent flow and destroyed bridges. Neither the surrounding meteorological and hydrological stations nor the gridded datasets, some of which also included radar data, showed more than a few millimetres of rainfall – far too little to cause such devastation.

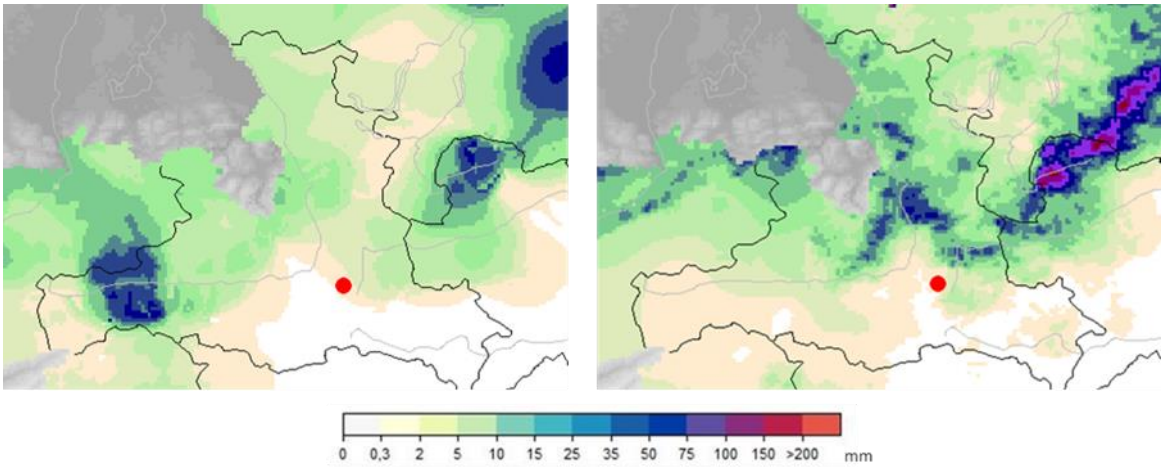

Fig. 3: Analysis of precipitation (Salzburg province) on 8 June 2003 from SPARTACUS (left) and INCA (right). Both analyses cover the period 0700 (CEST) on 8 June to 0700 on 9 June. The red dot marks the damaged area around Kleinarl/Wagrain and shows how little precipitation was recorded in the immediate vicinity of the event.

With respect to partially “invisible” events in the meteorological-hydrological data sources, all available datasets will need to be taken into account and combined in future for a robust assessment. An additional possibility is an increased involvement of the population in the observation and documentation of extreme weather events. This should be considered in future projects.

By taking into account the complex processes that occur as a result of precipitation, and by expanding and testing the database, there are good prospects for successfully implementing the planned research approaches based on SEVERE, such as improving user-oriented warnings and estimating the future risk of damage as a result of small-scale extreme events.

4 StartClim2017.C: EXTEND (EXTreme EveNts Documentation) documentation of the physical and social consequences of extreme events

People living in the Alpine region have been endangered by natural processes for generations, and extreme events frequently cause loss of human life and property and infrastructure damage and result in financial and immaterial loss. Recent research on climate change suggests a change in frequency and seasonality of precipitation patterns. To meet these new challenges in the long-run, a flexible and adaptable society is needed. Post-event documentation that includes information about the impact and damage as a result of disaster events is useful for estimation of the potential risks associated with these hazards. However, the consequences of extreme events are also influenced by the physical, economic and social vulnerability of the affected population. Hence, social aspects (e.g. age, gender, income or social networks) affect the ability and time needed to recover after an event and influence the resilience of a community.

The EXTEND project reviewed existing standardised methods for documenting extreme events in the German-speaking Alpine region (Austria, Germany, Switzerland, Italy) on the basis of an in-depth literature review, supplemented by an online survey, interviews and a workshop with experts in the field. Emphasis was given to social aspects in event documentation by investigating whether and how they were recorded and the benefit of this information for disaster-risk reduction.

Systematic documentation and analysis of past events helps with compensation and recovery efforts but also reveals vulnerability patterns and resilience deficits, which form the basis for “Building Back Better” (BBB) in the recovery and reconstruction phase. A review of the history of event documentation revealed that in past centuries natural hazard events and the related impact were mainly recorded in chronicles, research diaries and newspaper articles. In the Alpine region, event documentation has been standardised only in the last twenty to thirty years. This has been driven primarily by new technological developments (e.g. online databases) and two research projects dealing with this topic (DOMODIS and DisALP). In Austria, several institutions are responsible for event and damage assessments, including local authorities, insurance companies, research institutes and emergency services (e.g., fire brigade, Red Cross). The detail and nature of the data vary substantially, depending on the agency involved and the aim of the survey, which leads to difficulties regarding its comparability. The following main motives for data collection were identified in this project: loss compensation, damage statistics, in-depth understanding of trends, processes or meteorology, knowledge for planning processes (hazard maps, mitigation measures) and detailed documentation of disaster relief operations.

The results showed that standardised methods, guidelines and forms were usually available and were applied in all selected countries. “Standardisation” in this regard means that at least a minimum amount of required data – what happened when, where, why, and who documented – was captured in the database (according to 5W standards). The review revealed substantial differences in the quality of the standardisation, depending on whether a standardised procedure was implemented during data collection in the field or only when entering the data into the database. An important suggestion for improvement is therefore to ensure the quality and comparability of data on extreme events at the European level, since natural hazards are transborder events. Equally important is the need to improve the standardisation of terminology in event and damage documentation for all stakeholders in the Alpine region (consistent with international standards).

In the last few years, a growing demand for quality and standardised data acquisition has given rise to a number of training opportunities in the field of event documentation. However, this study revealed a lack of training on the use of innovative technologies in field operations. In addition, experts saw potential in citizen science methods, especially in the supply of data in the form of photos and videos of the damage or the course of the event. The analysis showed that at present most of the information collected related to the natural process itself or the financial losses, whereas social factors were rarely documented. At the same time, the literature review indicated that demographic characteristics, socioeconomic status, ownership structure, etc., play an important role in dealing with natural hazards. Many of the experts were critical of the idea of integrating social aspects in common post-event documentation, because of their concern about the additional time this might take. In the opinion of respondents, social aspects and their influence on vulnerability play an important role in the disaster-preparedness phase, e.g., for civil protection plans, in specific case studies or scientific issues.

Overall, the results suggest that the understanding of the underlying vulnerability factors needs to be improved. The literature review and expert workshop revealed that the community resilience approach could make an important contribution in that regard. This needs to be examined in the form of case studies. In addition to this, the collection of demographic indicators and gender-disaggregated data on the affected population would be useful as a way of strengthening the resilience of communities on the principle of “Build Back Better (BBB)” after events. This is rarely done in a systematic way, however, which reduces the comparability of the data. Furthermore, not all types of natural hazards and their consequences are influenced in the same way by social aspects, since, for example, avalanches usually have a very local impact on individual objects, whereas floods often compromise whole settlements or even valleys.

Guidelines for recording social aspects were developed during the project to improve event documentation in Austria, especially after flood events. The proposed schematic “people” form (see Fig. 4) contains core elements for post-event survey documentation. The minimum amount of required data is displayed in level 1, referring to proposed standards for risk assessments (according to Rios Diaz und Marin Ferrer, 2018 p. 24). Depending on the impact of the event, additional information can be documented on social vulnerability to natural disasters (level 2: see Cutter et al. 2003) or, through in-depth surveys, on the psychological impact of extreme events (level 3: see Bamberg et al. 2018).

Schematic survey sheet "people" - EXTEND project			
	Level	**Topic**	**Factors**
Attention, this data is subject to data protection	**Level 1**	**Minimal information**	Gender
			Age
			Income
			Special needs population
	Level 2	**Information about aspects on social vulnerability**	Demographic aspects
			Socio-demographic status
			Property rights and ownership structure
			Risk perception
			Coping capacities
			Health-related issues
			Neighbourhood relationships
	Level 3	**Psycholocical impacts**	Emotional aspects after the event
			Psychosomatic issues
			Return to normality, response capacity
			Adaptive capacity

Fig. 4: Schematic “people” form to document the social consequences of extreme weather events (level 1 has top priority).

5 StartClim2017.D: Monitoring of alien mosquitoes of the genus *Aedes* in Austria

Mosquitoes are known as vectors of a variety of different pathogens, for example flaviviruses. Systematic, continuous mosquito surveillance is considered the most reliable tool for predicting the spread and establishment of alien mosquito species, such as the Asian tiger mosquito (*Aedes albopictus*) and the Japanese bush mosquito (*Aedes japonicus*), and the transmission risk to humans of arboviruses like West Nile virus (WNV) and the tropical Dengue virus. So far, forty-nine mosquito species have been identified in Austria, including five alien species. The Japanese bush mosquito (*Aedes japonicus*) and *Anopheles hyrcanus* are established in parts of Austria, and the former is rapidly increasing its range. Only isolated examples of *Ae. albopictus* have been found in Austria so far. However, it is likely that this species will establish itself in the future, introduced as a result of intensive traffic and trade and the increasing temperatures as a concomitant of global climate change.

In summer 2017, the oviposition of introduced *Aedes* mosquitoes was monitored in five Austrian federal provinces – Carinthia, Vienna, Lower Austria, Styria and Burgenland. The project used “ovitraps”, which were placed in parks and other government areas as part of ongoing mosquito surveillance studies, but also in private gardens by participating citizen scientists.

Eggs of the Asian tiger mosquito (*Ae. albopictus*), an important arbovirus vector, were not found in any of the examined districts, while eggs of the Japanese bush mosquito (*Ae. japonicus*) were found in Lower Austria, Styria and Burgenland. In Vienna and Carinthia, all traps were negative for *Aedes* eggs.

This project demonstrated the benefits of including citizen scientists in mosquito surveillance studies using ovitraps.

To conclude, following recommendations are proposed:

- Nationwide coordination of vector sampling (including provision of data for a database – ECDC and/or AGES database, molecular-based databases
- More intense (e.g. monthly) and expanded (e.g. district level) monitoring scheme for alien mosquitoes and West Nile virus vectors
- Inclusion of citizen scientists (in close collaboration, supervised by scientists) to set up mosquito traps (e.g. ovitraps for invasive *Aedes* mosquito egg sampling)

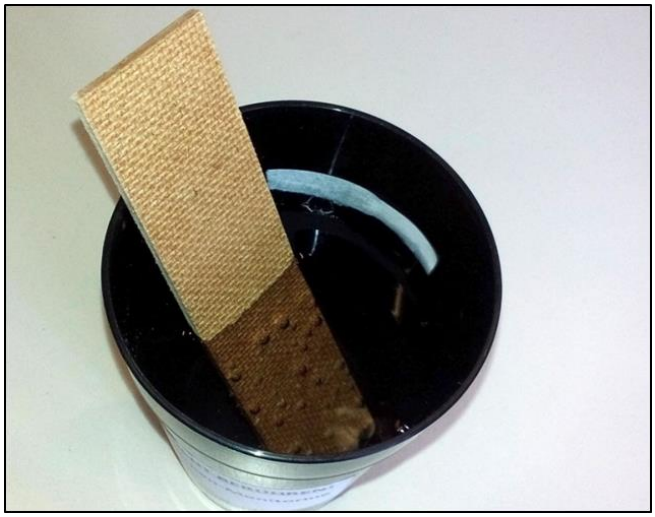

Fig. 5: The ovitrap is filled to about three-quarters (white line) with fresh tap water, and the wooden paddle is inserted with the rough side facing upward.

Fig. 6: *Aedes japonicus* eggs (arrows) on a wooden paddle from an ovitrap in Lower Austria.

Fig. 7: *Aedes japonicus* egg sampled in Lower Austria in July 2017.

6 References

StartClim2017.A

Anderl, M., Gössl, M., Kuschel V., Haider, S., Gangl, M., Heller, C., Lampert, C., Moosmann, L., Pazdernik, K, Poupa, S., Purzner, M., Schieder, W., Schneider, J., Schodl, B., Stix, S., Stranner, G., Storch, A., Wiesenberger, H., Winter, R., Zechmeister, A. und Zethner, G. (2016): Klimaschutzbericht 2016, Umweltbundesamt Wien.

Formayer, H., & Fritz, A. (2017). Temperature dependency of hourly precipitation intensities–surface versus cloud layer temperature. International Journal of Climatology, 37(1), 1-10.

Formayer, H., Leidinger , D., Nadeem, I. (2015): Klimaszenarien für das 21. Jahrhundert für Oberösterreich. Band 5 in: Auswirkungen des Klimawandels auf Oberösterreich. https://www.doris.at/themen/umwelt/pdf/clairisa/coin/Methodik_Klimaszenarien.pdf

Kletzan-Slamanig, D. und Köppl, K. (2016): Subventionen und Steuern mit Umweltrelevanz in den Bereichen Energie und Verkehr. Österreichisches Institut für Wirtschaftsforschung, Wien.

Lefenda, J. und Pöchhacker-Tröscher, G. (2016): Programmevaluierung Haus der Zukunft 1999 - 2013: Evaluierungsbericht. Bundesministerium für Verkehr, Innovation und Technologie, Wien.

Switanek, M. B., Troch, P. A., Castro, C. L., Leuprecht, A., Chang, H. I., Mukherjee, R., &

Demaria, E. M. (2017). Scaled distribution mapping: a bias correction method that preserves raw climate model projected changes. Hydrology and Earth System Sciences, 21(6), 2649.

Kronberger-Kießwetter, B., Balas M., Prutsch A., (2012): Die Österreichische Strategie zur Anpassung an den Klimawandel, Teil 1 – Kontext und Teil 2 – Aktionsplan Handlungsempfehlungen für die Umsetzung, Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft, Wien.

StartClim2017.B

Anders, I., Haslinger, K., Lexer, A., Salzmann, M., Resch, G., Knauder, W., Wolf, M. (2017): Monatsaktuelle regionale Klimasimulation der Vergangenheit optimiert für den Alpenraum mit COSMO-CLM. Vortrag am 7. Österreichischen MeteorologInnentag, 9.-10.11.2017, Graz. http://wegcwww.uni-graz.at/meteotag2017/data/public/files/meteotag2017_Ivonne_Anders_presentation_126.pdf

Baker, D.B., Richards, R.P., Loftus, T.T., Kramer, J.W., 2004. A NEW FLASHINESS INDEX: CHARACTERISTICS AND APPLICATIONS TO MIDWESTERN RIVERS AND STREAMS. Journal of the American Water Resources Association 40, 503–522. https://doi.org/10.1111/j.1752-1688.2004.tb01046.x

Blöschl G., Nester T., Komma J., Parajka J., Perdigao RAP. 2013. The June 2013 flood in the Upper Danube basin, and comparisons with the 2002, 1954 and 1899 floods. Hydrology and Earth System Sciences 17: 5197-5212, doi:10.5194/hess-17-5197-2013.

BLU (Bayerisches Landesamt für Umwelt). 2006. August – Hochwasser 2005 in Südbayern (August 2005 flood in Southern Bavaria), Endbericht vom 12. April 2006, Bayerisches Landesamt für Umwelt, München, 49 pp., 2006.

BLfW - Bayrisches Landesamt für Wasserwirtschaft (Hrsg.). 2003. Hochwasser Mai 1999, Gewässerkundliche Beschreibung. Bayerisches Landesamt für Wasserwirtschaft,

München, 2003. (URL http://www.lfu.bayern.de/wasser/hw_ereignisse/aktuell/doc/bericht_pfingsten99.pdf, 03-2017-18).

BMLFUW – Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft (2017): Kronberger-Kießwetter, B., Balas, M., Prutsch, A.: Die Österreichische Strategie zur Anpassungs and den Klimawandel: Teil 1 - Kontext. Wien. 155 pp. Download unter: https://www.bmnt.gv.at/umwelt/klimaschutz/klimapolitik_national/anpassungsstrategie/strategie-kontext.html (04.06.2018)

Borga, M., Anagnostou, E.N., Blöschl, G., Creutin, J.-D., 2011. Flash flood forecasting, warning and risk management: the HYDRATE project. Environmental Science & Policy 14, 834–844. https://doi.org/10.1016/j.envsci.2011.05.017

Borga, M., Anagnostou, E.N., Blöschl, G., Creutin, J.-D., 2010. Flash floods: Observations and analysis of hydro-meteorological controls. Journal of Hydrology 394, 1–3. https://doi.org/10.1016/j.jhydrol.2010.07.048

Braun, M., Kaitna, R. (2018) A comparative analysis of meteorological trigger conditions for torrential processes on a daily and sub-daily time scale for Austria, In: European Geosciences Union (Ed.), Geophysical Research Abstracts Vol. 20, EGU2018-16169; ISBN: 1607-7962

Enigl, K., Matulla, C., Schmid, F., Schellander-Gorgas, T. (2018): Creation of an Austria-wide event database and evaluation of correlations between local scaled weather developments and extreme events. In: European Geosciences Union (Ed.), Geophysical Research Abstracts Vol. 20, EGU2018-16907.

Frei, C., Schär, C., 1998. A precipitation climatology of the Alps from high-resolution rain-gauge observations. International Journal of Climatology 18, 873–900. https://doi.org/10.1002/(SICI)1097-0088(19980630)18:8<873::AID-JOC255>3.0.CO;2-9

Gaal, L., Szolgay, J., Kohnova, S., Parajka, J., Merz, R., Viglione, A., Blöschl, G. (2012): Flood timescales: Understanding the interplay of climate and catchment processes through comparative hydrology. Water Resources Research 48, W04511, doi:10.1029/2011WR011509.

Gaume, E., Bain, V., Bernardara, P., Newinger, O., Barbuc, M., Bateman, A., Blaškovičová, L., Blöschl, G., Borga, M., Dumitrescu, A., Daliakopoulos, I., Garcia, J., Irimescu, A., Kohnova, S., Koutroulis, A., Marchi, L., Matreata, S., Medina, V., Preciso, E., Sempere-Torres, D., Stancalie, G., Szolgay, J., Tsanis, I., Velasco, D., Viglione, A., 2009. A compilation of data on European flash floods. Journal of Hydrology 367, 70–78. https://doi.org/10.1016/j.jhydrol.2008.12.028

Grillakis, M.G., Koutroulis, A.G., Komma, J., Tsanis, I.K., Wagner, W., Blöschl, G., 2016. Initial soil moisture effects on flash flood generation – A comparison between basins of contrasting hydro-climatic conditions. Journal of Hydrology 541, 206–217. https://doi.org/10.1016/j.jhydrol.2016.03.007

Guzzetti, F., Peruccacci, S., Rossi, M., Stark, C.P., 2007. Rainfall thresholds for the initiation of landslides in central and southern Europe. Meteorology and Atmospheric Physics 98, 239–267. https://doi.org/10.1007/s00703-007-0262-7

Guzzetti, F., Peruccacci, S., Rossi, M., Stark, C.P., 2008. The rainfall intensity–duration control of shallow landslides and debris flows: an update. Landslides 5, 3–17. https://doi.org/10.1007/s10346-007-0112-1

Haiden T, Kann A, Wittmann C, Pistotnik G, Bica B, Gruber C. (2011). The Integrated Nowcasting through Comprehensive Analysis (INCA) System and Its Validation over the Eastern Alpine Region. Weather and Forecasting, 26/2, 166-183, doi: 10.1175/2010WAF2222451.1

Haslinger, K., Bartsch, A., 2016. Creating long-term gridded fields of reference evapotranspiration in Alpine terrain based on a recalibrated Hargreaves method. Hydrology and Earth System Sciences 20, 1211–1223. https://doi.org/10.5194/hess-20-1211-2016

Hiebl, J., Frei, C., 2018. Daily precipitation grids for Austria since 1961—development and evaluation of a spatial dataset for hydroclimatic monitoring and modelling. Theoretical and Applied Climatology 132, 327–345. https://doi.org/10.1007/s00704-017-2093-x

Hiebl, J., Frei, C., 2016. Daily temperature grids for Austria since 1961—concept, creation and applicability. Theoretical and Applied Climatology 124, 161–178. https://doi.org/10.1007/s00704-015-1411-4

Hofstätter, M, Jacobeit, J., Homann, M, Lexer, A. Chimani, B., Philipp, A., Beck, C., Ganekind (2015): WETRAX - WEather Patterns, CycloneTRAcks and related precipitation Extremes, 240 pp., Augsburg, ISBN 3-923273-96-6

Hofstätter, M., Chimani, B., Lexer, A., Blöschl, G., 2016. A new classification scheme of European cyclone tracks with relevance to precipitation: EUROPEAN CYCLONE TRACK TYPES AND PRECIPITATION. Water Resources Research 52, 7086–7104. https://doi.org/10.1002/2016WR019146

Hofstätter, M., Lexer, A., Homann, M., Blöschl, G., 2018. Large-scale heavy precipitation over central Europe and the role of atmospheric cyclone track types: HEAVY PRECIPITATION AND CYCLONE TRACKS. International Journal of Climatology 38, e497–e517. https://doi.org/10.1002/joc.5386

Holko, L., Parajka, J., Kostka, Z., Škoda, P., Blöschl, G., 2011. Flashiness of mountain streams in Slovakia and Austria. Journal of Hydrology 405, 392–401. https://doi.org/10.1016/j.jhydrol.2011.05.038

Huber, A., Fromm, R., Schellander, H., Stuke, S. (2014): Projektbericht MUWA – (Weiter)-Entwicklung eines meteorologischen Frühwarnsystems für Muren. Endbericht einer Kooperation zwischen ZAMG, Regionalstelle Tirol und Vorarlberg und BFW.

Humer G., Reithofer, A., Klar, R., Achleitner, S., 2015. Erweiterung eines 2D-Strömungsmodelles zur Berechnung von Sturzfluten. Erweiterung eines 2D-Strömungsmodelles zur Berechnung von Sturzfluten 164–171. https://doi.org/10.3243/kwe2015.03.002

IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

Jacob, D., Petersen, J., Eggert, B., Alias, A., Christensen, O.B., Bouwer, L.M., Braun, A., Colette, A., Déqué, M., Georgievski, G., Georgopoulou, E., Gobiet, A., Menut, L., Nikulin, G., Haensler, A., Hempelmann, N., Jones, C., Keuler, K., Kovats, S., Kröner, N., Kotlarski, S., Kriegsmann, A., Martin, E., van Meijgaard, E., Moseley, C., Pfeifer, S., Preuschmann, S., Radermacher, C., Radtke, K., Rechid, D., Rounsevell, M., Samuelsson, P., Somot, S., Soussana, J.-F., Teichmann, C., Valentini, R., Vautard, R., Weber, B., Yiou, P., 2014. EURO-CORDEX: new high-resolution climate change projections for European impact research. Regional Environmental Change 14, 563–578. https://doi.org/10.1007/s10113-013-0499-2

Kaitna, R., Prenner, D., Braun, M., Mostbauer, K., Maraun, D., Switanek, M., Stoffel, M., Hrachowitz, M. (2017): Determination of past and future trigger conditions of torrential processes at different temporal and spatial scales – the Deucalion II project.,In: Climate Change Centre Austria (Hrsg.), 18. Klimatag, Tagungsband, Aktuelle Klimaforschung in Österreich

Kaitna, R; Ballesteros, J; Braun, M; Hrachowitz, M; Maraun, D; Mostbauer, K; Prenner, D; Stoffel, M; Switanek, M. (2018): Hydro-meteorological trigger conditons of torrential hazards in the Austrian Alps, In: Climate Change Centre Austria (Hrsg.), 19. Klimatag, Tagungsband, Aktuelle Klimaforschung in Österreich

Köberl, J., Köberl, J., Prettenthaler, F., Schubert, C. (2018): DAMAGE.at – Machbarkeitsanalyse des Aufbaus einer österreichweiten Schadendatenbank zu wetter- und klimabedingten Infrastrukturschäden, Endbericht im Auftrag des Klima- und Energiefonds, Graz, 22 pp.

Luzian, R. (2002): Die österreichische Schadenslawinen–Datenbank. Foschungsanliegen – Aufbau –erste Ergebnisse (mit Kartenbeilage „gemeindeweise Lawinendichte“), Mitteilungen der Forstlichen Bundesversuchsanstalt Wien (FBVA), Nr. 175/2002, 51 S.,Wien

Luzian, R., Eller, M. (2005): Schadlawinen-Datenbank für Österreich. BFW Praxisinformation, Nr. 8/2005, ISSN: 1815-3895, p. 11-12. http://bfw.ac.at/040/pdf/1818_pi8.pdf

Marra, F., Destro, E., Nikolopoulos, E.I., Zoccatelli, D., Creutin, J.D., Guzzetti, F., Borga, M., 2017. Impact of rainfall spatial aggregation on the identification of debris flow occurrence thresholds. Hydrology and Earth System Sciences 21, 4525–4532. https://doi.org/10.5194/hess-21-4525-2017

Matulla, C., Hollósi, B., Balas, M. (2015): SNORRE – Screening von Witterungsverhältnissen. Endbericht von StartClim2014.A in StartClim2014: Beiträge zur Umsetzung der österreichischen Anpassungsstrategie, Auftraggeber: BMLFUW, BMWFW, ÖBF, Land Oberösterreich

Mendlik, T., Maraun, D., Truhetz, H. (2017): STARC-Impact: Prozessbasierte Evaluierung der ÖKS15 Klimaszenarien: Climate Change Centre Austria (Hrsg.), 18. Klimatag, Tagungsband, Aktuelle Klimaforschung in Österreich, S. 90-91.

Merz, R., Blöschl, G., Parajka, J. (2006): Spatio-temporal variability of event runoff coefficients in Austria, Journal of Hydrology, 331, 591 - 604. doi:10.1016/j.jhydrol.2006.06.008

Mostbauer, K., Kaitna, R., Prenner, D., Hrachowitz, M. (2018): The temporally varying roles of rainfall, snowmelt and soil moisture for debris flow initiation in an alpine region. In: European Geosciences Union (Ed.), Geophysical Research Abstracts Vol. 20, EGU2018-4999; ISBN: 1607-7962

Mostbauer, K., Kaitna, R., Prenner, D., Hrachowitz, M. (2017): The temporally varying roles of rainfall, snowmelt and soil moisture for debris flow initiation in a snow dominated system: the compound trigger concept. Hydrology and Earth System Sciences Discussions 1–33. https://doi.org/10.5194/hess-2017-626

Papathoma-Köhle, M., Kappes, M., Keiler, M., Glade, T. (2011). Physical vulnerability assessment for alpine hazards: state of the art and future needs. Natural Hazards 58, 645–680. https://doi.org/10.1007/s11069-010-9632-4

Peruccacci, S., Brunetti, M.T., Gariano, S.L., Melillo, M., Rossi, M., Guzzetti, F., 2017. Rainfall thresholds for possible landslide occurrence in Italy. Geomorphology 290, 39–57. https://doi.org/10.1016/j.geomorph.2017.03.031

Piciullo, L., Gariano, S.L., Melillo, M., Brunetti, M.T., Peruccacci, S., Guzzetti, F., Calvello, M., 2017. Definition and performance of a threshold-based regional early warning model for rainfall-induced landslides. Landslides 14, 995–1008. https://doi.org/10.1007/s10346-016-0750-2

Prenner, D., Kaitna, R., Mostbauer, K., Hrachowitz, M. (2018): What can hydro-meteorological variables tell us about debris flow occurence? In: European

Geosciences Union (Ed.), Geophysical Research Abstracts Vol. 20, EGU2018-8269; ISBN: 1607-7962

Reisenhofer, S. (2015): Der Weg zum digitalen intelligenten Unwetterarchiv. ZAMG Newsletter 01/2015. 7. https://www.zamg.ac.at/cms/de/dokumente/topmenu/Newsletter_2015_01.pdf

Reisenhofer, S., (2016): VIOLA-Violent Observed Local Assessment: Die neue Unwetterdatenbank der ZAMG. Interner Vortrag an der ZAMG, Wien, 23.05.2016.

Reithofer, A., Humer, G., 2016. Flash Flood Risk Map Upper Austria – Evaluierung des Schadensrisikos durch Starkregenereignisse anhand eines erweiterten 2D-Strömungsmodells. Wichmann Verlag, Germany.

Schabenberger, O., Gotway, C.A., 2005. Statistical methods for spatial data analysis, Texts in statistical science. Chapman & Hall/CRC, Boca Raton.

Schröer, K., Tye, M. R. (2018): Identifying Patterns in Extreme Precipitation Risk and the Related Impacts, Vortrag am AMS 98th Annual Meeting, 18.01.2018, Austin, Texas. Abstract: https://ams.confex.com/ams/98Annual/webprogram/Paper336822.html

Seger, M. 2001: Rauminformationssystem Österreich – ein digitaler thematischer Datensatz des Staatsgebietes. In: Österreichische Zeitschrift für Vermessung und Geoinformation 2, S. 101-110.

Shepard, D.S., 1984. Computer Mapping: The SYMAP Interpolation Algorithm, in: Gaile, G.L., Willmott, C.J. (Eds.), Spatial Statistics and Models. Springer Netherlands, Dordrecht, pp. 133–145. https://doi.org/10.1007/978-94-017-3048-8_7

Tilch, N. (2017): Fachliche Impulse für die Masterarbeiten. Vortrag im Rahmen einer Fortbildung für Masterstudenten der Meteorologie im Bereich gravitative Massenbewegungen, 20.12.2017, ZAMG, Wien.

VVO (2015): Unwetterbilanz 2015: Ein Jahr geprägt von hohen Temperaturen. https://www.vvo.at/vvo/vvo.nsf/sysPages/1EDED07CC461A84DC1257F0900445309# (07.05.2018)

Vessia, G., Parise, M., Brunetti, M.T., Peruccacci, S., Rossi, M., Vennari, C., Guzzetti, F., 2014. Automated reconstruction of rainfall events responsible for shallow landslides. Natural Hazards and Earth System Science 14, 2399–2408. https://doi.org/10.5194/nhess-14-2399-2014

StartClim2017.C

Adger, W. N. (2006). Vulnerability. Global Environmental Change, 16(3), 268–281. https://doi.org/10.1016/j.gloenvcha.2006.02.006

Baćanović, V. (2016). Gender analysis of the impact of the 2014 floods in Serbia. Retrieved from OSCE-Organization for Security and Co-operation in Europe website: https://www.osce.org/serbia/135021?download=true

Bamberg, S., Beelmann, W., Stricker, M., Masson, T., Schäffler, A., & Heidenreich, A. (2018). RISK_M - Soziale Mobilisierung zur Optimierung eines Risikomanagements bei extremen Hochwasserereignissen. abgerufen unter: http://www.risk-m.de, am 29.05.2018.

Bamberg, S., Masson, T., Brewitt, K., & Nemetschek, N. (2017). Threat, coping and flood prevention – A meta-analysis. Journal of Environmental Psychology, 54, 116–126. https://doi.org/10.1016/j.jenvp.2017.08.001

Beccari, B. (2016). A Comparative Analysis of Disaster Risk, Vulnerability and Resilience Composite Indicators. PLoS Currents, 8. https://doi.org/10.1371/currents.dis.453df025e34b682e9737f95070f9b970

Beerlage, I. (2016). Community Resilience. In Atlas der Verwundbarkeit und Resilienz - Pilotausgabe zur Deutschland, Österreich, Liechtenstein und Schweiz (pp. 30–33). Köln und Bonn,

Birkmann, J., Cardona, O. D., Carreño, M. L., Barbat, A. H., Pelling, M., Schneiderbauer, S., Kienberger, S., Keiler, M., Alexander, D., Zeil, P., & Welle, T. (2013). Framing vulnerability, risk and societal responses: the MOVE framework. Natural Hazards, 67(2), 193–211. https://doi.org/10.1007/s11069-013-0558-5

Birkmann, J., Cardona, O. D., Carreño, M. L., Barbat, A. H., Pelling, M., Schneiderbauer, S., Kienberger, S., Keiler, M., Alexander, D., Zeil, P., & Welle, T. (2013). Framing vulnerability, risk and societal responses: the MOVE framework. Natural Hazards, 67(2), 193–211. https://doi.org/10.1007/s11069-013-0558-5

Birkmann, J., Bach, C., & Vollmer, M. (2012). Tools for Resilience Building and Adaptive Spatial Governance. Raumforschung Und Raumordnung, 70(4), 293–308. https://doi.org/10.1007/s13147-012-0172-0

BMI.gv.at. (2018). Krisen- und Katastrophenmanagement: KATWARN Österreich. abgerufen unter: https://www.bmi.gv.at, am 29.05.2018.

BMLFUW. (2012). Die österreichische Strategie zur Anpassung an den Klimawandel. Teil 2 Aktionsplan. Handlungsempfehlungen für die Umsetzung. Wien.

BMLFUW, BMBF, & ISPRA. (2011). IMRA-CRUE: Integrative Hochwasserrisiko Governance-Ansatz für die Verbesserung des Risikobewusstseins und stärkere Beteiligung der Öffentlichkeit. abgerufen unter: http://www.imra.cnr.it, am 29.05.2018.

BMNT. (2018). Ereignisdokumentation Aufgabe und historische Entwicklung. abgerufen unter: http://www.naturgefahren.at, am 29.05.2018.

Brouwer, R., Akter, S., Brander, L., & Haque, E. (2007). Socioeconomic vulnerability and adaptation to environmental risk: a case study of climate change and flooding in Bangladesh. Risk Analysis, 27(2), 313–326. https://doi.org/10.1111/j.1539-6924.2007.00884.x

Bubeck, P., Botzen, W.J.W., Kreibich, H., & Aerts, J.C.J.H. (2013). Detailed insights into the influence of flood-coping appraisals on mitigation behaviour. Global Environmental Change, 23(5), 1327–1338. https://doi.org/10.1016/j.gloenvcha.2013.05.009

Chávez-Rodriguez, L. (2013). Klimawandel und Gender: Untersuchung der Bedeutung von Geschlecht für die soziale Vulnerabililtät in überflutungsgefährdeten Gebieten (Dissertation). Universität Bremen, Bremen.

Colten, C. E. (2006). Vulnerability and Place: Flat Land and Uneven Risk in New Orleans. American Anthropologist, 108(4), 731–734. https://doi.org/10.1525/aa.2006.108.4.731

Consiglio Nazionale delle Ricerche. (1999-2018). Sistema informativo sulle catastrofi idrogeologiche. abgerufen unter: http://sici.irpi.cnr.it, am 29.05.2018.

Cutter, S. L. (2017). The forgotten casualties redux: Women, children, and disaster risk. Global Environmental Change, 42, 117–121. https://doi.org/10.1016/j.gloenvcha.2016.12.010

Cutter, S. L., Boruff, B. J., & Shirley, W. L. (2003). Social Vulnerability to Environmental Hazards Social Science Quarterly, 84(2), 242–261. https://doi.org/10.1111/1540-6237.8402002

Cutter, S. L., Corendea, C., & eds. (2013). From social vulnerability to resilience: measuring progress toward disaster risk reduction outcomes of the 7th UNU-EHS Summer Academy of the Munich Re Foundation Chair on Social Vulnerability, 1 - 7 July 2012, Hohenkammer, Germany. Bonn: UNU-EHS; MunichRE.

Cutter, S. L., Emrich, C. T., Webb, J. J., & Morath, D. (2009). Social Vulnerability to Climate Variability Hazards: A Review of the Literature. South Carolina, Columbia.

Cutter, S. L., & Finch, C. (2008). Temporal and spatial changes in social vulnerability to natural hazards. Proceedings of the National Academy of Sciences of the United States of America, 105(7), 2301–2306. https://doi.org/10.1073/pnas.0710375105

Damyanovic, D., Fuchs, B., Reinwald, F., Pircher, E., Allex, B., Eisl, J., Brandenburg, C., & Hübl, J. (2014). GIAKlim – Gender Impact Assessment im Kontext der Klimawandelanpassung und Naturgefahren. Endbericht von StartClim2013.F in StartClim2013: Anpassung an den Klimawandel in Österreich – Themenfeld Wasser, Auftraggeber: BMLFUW, BMWF, ÖBF, Land Oberösterreich.

Damyanovic, D., Weber, K., Stickler, T., Tscharner, S., Fuchs, B., Gruber, S., Machold, I., Dax, t., Hübl, J., Balas, M., & Glas, N. (2017). Climate change adaptation and protection from natural hazards: capacity building for people with migration background in Austria. abgerufen unter: https://www.klimafonds.gv.at, am 29.05.2018.

Damyanovic, D., Weber, K., Fuchs, B., & Brandenburg, C. (2016). A Gender-sensitive Analysis of Natural Disasters – The Case of St. Lorenzen in Austria. In Interpraevent (Ed.), Conference proceedings (pp. 43–51).

Deutsches GeoForschungsZentrum GFZ. (2015). HOWAS 21 - Hochwasserschadensdatenbank. abgerufen unter: http://howas21.gfz-potsdam.de, am 29.05.2018.

DKKV. (2015). Das Hochwasser im Juni 2013: Bewährungsprobe für das Hochwasserrisikomanagement in Deutschland: Schriftenreihe des DKKV. Bonn: DKKV.

Enarson, E., & Morrow, B. H. (Eds.). (1998). The Gendered Terrain of Disaster: Through Women´s Eyes. Westport: Praeger.

Enarson, E. P., & Pease, B. (2016). Men, masculinities and disaster.

Fekete, A., & Hufschmidt, G. (2016). Atlas der Verwundbarkeit und Resilienz - Pilotausgabe zur Deutschland, Österreich, Liechtenstein und Schweiz. Köln und Bonn.

FEMA. (2003). Multi-hazard Loss Estimation Methodology: HAZUS-MH MR3.

Fielding, J. L. (2012). Inequalities in exposure and awareness of flood risk in England and Wales. Disasters, 36(3), 477–494. https://doi.org/10.1111/j.1467-7717.2011.01270.x

Foitik, G. (2018, März). Team Österreich Digital: Team Österreich weiter gedacht. abgerufen unter: zur Verfügung gestellt vom Autor für Projektzwecke

Fothergill, A. (1999). Women's roles in a disaster. Applied Behavioral Science Review, 7(2), 125–143. https://doi.org/10.1016/S1068-8595(00)80014-8

Fuchs, S., & Thaler, T. (Eds.). (2018). Vulnerability and resilience to natural hazards. Cambridge: Cambridge University Press.

Gems, B., Sturm, M., Keller, F., Fuchs, S., Papathoma-Köhle, M., Mazzorana, B., & Aufleger, M. (2018). Einwirkungen fluviatiler Fließprozesse auf Gebäude. In "Stand der Technik im Naturgefahren-Ingenieurwesen" (Hrsg.), Stand der Technik im Naturgefahren-Ingenieurwesen.

Groeve, T. de, Ehlrich, D., & Corbane, C. (2015). Guidance for recording and sharing disaster damage and loss data: Towards the development of operational indicators to translate the Sendai Framework into action. EUR, Scientific and technical research series: Vol. 27192. Luxembourg: Publications Office.

Groeve, T. de, Poljansek, K., Ehrlich, D., & Corbane, C. (2014). Current status and best practices for disaster loss data recording in EU Member States. EUR, Scientific and technical research series: Vol. 26879. Luxembourg: Publications Office.

Groeve, T. de, Poljansek, K., Ehrlich, D., European Commission, Joint Research Centre, & Institute for the Protection and the Security of the Citizen. (2013). Recording disaster losses: recommendations for a European approach. Luxembourg: Publications Office.

Grothmann, T., & Reusswig, F. (2006). People at Risk of Flooding: Why Some Residents Take Precautionary Action While Others Do Not. Natural Hazards, 38(1-2), 101–120. https://doi.org/10.1007/s11069-005-8604-6

Guzzetti, F., & Tonelli, G. (2004). Information system on hydrological and geomorphological catastrophes in Italy (SICI): a tool for managing landslide and flood hazards. Natural Hazards and Earth System Science, 4(2), 213–232. https://doi.org/10.5194/nhess-4-213-2004

Heim, N., Kautz, H., Kociu, A., & Schäffer, G. (2004). Georisiken Dokumentation an der geologischen Bundesanstalt. In J. T. Weidinter, H. Lobitzer, & I. Spitzbart (Eds.): Vol. 2. Gmundner Geo-Studien, Beiträge zur Geologie des Salzkammerguts: Begleitband zur Tagung Erde - Mensch - Kultur - Umwelt, 28. - 31. August 2003, Gmunden, Österreich = Contributions to the geology of the Salzkammergut Region, Austria (2nd ed.). Gmunden, Traunsteinstr. 335.

Hübl, J. (Hrsg.) 2007. Ereignisdokumentation in Wildbächen - Systematik und mögliche Ergebnisse. Inst. für Wasserbau und Ingenieurhydrologie, Techn. Univ. Wien.

Hübl, J. (2018, March). Erfahrungsbericht aus der Praxis der Ereignisdokumentation: "DOMODIS" and far beyond. Präsentation im Rahmen des Expertsworkshop EXTEND, Wien. abgerufen unter: auf Anfrage an das AutorInnenteam

Hübl, J., Kienholz, H., Loipersberger, A. (Hrsg.). (2002). Handbuch 1. DOMODIS - Documentation of Mountain Disasters: State of Discussion in the European Mountain Areas (Schriftenreihe 1). Klagenfurt, Austria.

Hübl, J., Kociu, A., Krissl, H., Lang, E., Länger, E., Moser, Pichler, A.; Rachoy, C.; Rudolf-Miklau, F.; Schnetzer, I.; Sitter, F.; Skolaut, C.; Tilch, N.; Totschnig, R. (Hrsg.). (2009). Alpine Naturkatastrophen: Lawinen, Muren, Felsstürze, Hochwässer. Graz: Stocker.

Hübl, J., & Tscharner, S. (2015). Eigenvorsorge und technischer Gebäudeschutz im Naturgefahrenmanagement - Wegweiser Naturgefahren: Eine Anleitung zum naturgefahrenangepassten Bauen. Österreichische Ingenieur- Und Architekten-Zeitschrift (ÖIAZ). (1/12/2015), 137–141.

IASC. (2006). Women, Girls, Boys and Men: Different Needs - Equal Opportunities.: Gender Handbook in Humanitarian Action. abgerufen unter: https://interagencystandingcommittee.org, am 29.05.2018.

IPCC (Ed.). (2015). Climate change 2014: Synthesis report: Contribution of Working Groups I,II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. Geneva, Switzerland: Intergovernmental Panel on Climate Change.

Kar, N. (2009). Psychological impact of disasters on children: review of assessment and interventions. World Journal of Pediatrics: WJP, 5(1), 5–11. https://doi.org/10.1007/s12519-009-0001-x

Kobald J. (2015). Entwicklung von Kriterien zur Bestimmung von Gebäudeschutzklassen Sammlung und Analyse von durch Steinschlag und Lawinen beschädigten Gebäuden. Masterarbeit Institut für Alpine Naturgefahren, BOKU Wien. Betreuung: Univ.Prof.DI Dr. nat.techn. Johannes Hübl. Wien.

Köberl, J. (2018). Foliensatz Expertsworkshop: Ermöglichung des Aufbaus einer österreichweiten Datenbank zu Schäden aus Naturgefahren (Machbarkeitsanalyse) Vorstellung des Projektes DAMAGE.at, Projektbearbeitung JOANNEUM RE-SEARCH –LIFE und CCCA-Datenzentrum.

Laska, S., & Morrow, B. H. (2006). Social Vulnerabilities and Hurricane Katrina: An Unnatural Disaster in New Orleans. Marine Technology Society Journal, 40(4), 16–26. https://doi.org/10.4031/002533206787353123

Le Masson, V. (2013). Exploring Disaster Risk Reduction and Climate Change Adaptation from a gender perspective. Insights from Ladakh, India (Thesis). Brunel University, West London.

Long, A. P. (2007). Poverty Is the New Prostitution: Race, Poverty, and Public Housing in Post-Katrina New Orleans. Journal of American History, 94(3), 795–803. https://doi.org/10.2307/25095141

Lovell, E., & Le Masson, V. (2014). Equity and inclusion in disaster risk reduction: building resilience for all: ODI, CDKN.

Marchi, B. A. de, Scolobig, A., delli Zotti, G., & del Zotto, M. (2007). Risk construction and social vulnerability in an Italian Alpine Region: FLOODsite report T11-07-15.

Mattula, C., Hollósi, B., & Balas, M. (2015). SNORRE – Screening von Witterungsverhältnissen.: Endbericht von StartClim2014.A in StartClim2014: Beiträge zur Umsetzung der österreichischen Anpassungsstrategie. Auftraggeber: BMLFUW, BMWFW, ÖBF, Land Oberösterreich.

McGuire, L. C., Ford, E. S., & Okoro, C. A. (2007). Natural disasters and older US adults with disabilities: implications for evacuation. Disasters, 31(1), 49–56. https://doi.org/10.1111/j.1467-7717.2007.00339.x

Members of the FLOODsite Consortium. (2009). FLOODsite: Integrated Flood Risk Analysis and Management Methodologies. abgerufen unter: www.floodsite.net, am 29.05.2018.

Merz, M. (2011). Entwicklung einer indikatorenbasierten Methodik zur Vulnerabilitätsanalyse für die Bewertung von Risiken in der industriellen Produktion. Karlsruhe: KIT Scientific Publishing.

Momsen, J. H. (2010). Gender and development (2nd editon). Routledge perspectives on development. Abingdon, Oxon, New York, NY: Routledge. abgerufen unter: http://site.ebrary.com, am 29.05.2018.

Morrow, B. H. (2008). Community resilience. A social justice perspective: CARRI Research Report 4. Retrieved from Community and Regional Resilience Initiative.

MunichRE. (2011). NatCatSERVICE Naturkatastrophen-Knowhow für Risikomanagement und Forschung. München.

Neria, Y., Nandi, A., & Galea, S. (2008). Post-traumatic stress disorder following disasters: a systematic review. Psychological Medicine, 38(4), 467–480. https://doi.org/10.1017/S0033291707001353

Neumayer, E., & Plümper, T. (2007). The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981–2002. Annals of the Association of American Geographers, 97(3), 551–566. https://doi.org/10.1111/j.1467-8306.2007.00563.x

Ngo, E. B. (2001). When Disasters and Age Collide: Reviewing Vulnerability of the Elderly. Natural Hazards Review, 2(2), 80–89. https://doi.org/10.1061/(ASCE)1527-6988(2001)2:2(80)

Norris, F. H., Perilla, J. L., Riad, J. K., Kaniasty, K., & Lavizzo, E. A. (1999). Stability and change in stress, resources, and psychological distress following natural disaster: Findings from hurricane Andrew. Anxiety, Stress, and Coping, 12(4), 363–396. https://doi.org/10.1080/10615809908249317

Oliver-Smith, A., Alcántara-Ayala, I., Burton, I., & Lavell, A. M. (2016). Forensic Investigations of Disasters (FORIN): a conceptual framework and guide to research: IRDR FORIN Publication No.2.

Papathoma-Köhle, M., Gems, B., Sturm, M., & Fuchs, S. (2017). Matrices, curves and indicators: A review of approaches to assess physical vulnerability to debris flows. Earth-Science Reviews, 171, 272–288. https://doi.org/10.1016/j.earscirev.2017.06.007

Peacock, G. W., & Girard, C. (2012). Ethnic and racial inequalities in hurricane insurance and settlements. In G. W. Peacock, H. Gladwin, & B. H. Morrow (Eds.), Hurricane Andrew: Ethnicity, Gender and the Sociology of Disasters (pp. 171–190). Hoboken: Taylor and Francis.

Peacock, G. W., Gladwin, H., & Morrow, B. H. (Eds.). (2012). Hurricane Andrew: Ethnicity, Gender and the Sociology of Disasters. Hoboken: Taylor and Francis. abgerufen unter: http://gbv.eblib.com, am 29.05.2018.

Petrucci, O., Salvati, P., Aceto, L., Bianchi, C., Pasqua, A. A., Rossi, M., & Guzzetti, F. (2017). The Vulnerability of People to Damaging Hydrogeological Events in the Calabria Region (Southern Italy). International Journal of Environmental Research and Public Health, 15(1). https://doi.org/10.3390/ijerph15010048

Pfefferbaum, R. L., Pfefferbaum, B., Nitiéma, P., Houston, J. B., & van Horn, R. L. (2015). Assessing Community Resilience. American Behavioral Scientist, 59(2), 181–199. https://doi.org/10.1177/0002764214550295

Pfefferbaum, R. L., Pfefferbaum, B., van Horn, R. L., Klomp, R. W., Norris, F. H., & Reissman, D. B. (2013). The Communities Advancing Resilience Toolkit (CART): an intervention to build community resilience to disasters. Journal of Public Health Management and Practice: JPHMP, 19(3), 250–258. https://doi.org/10.1097/PHH.0b013e318268aed8

Philips, B., & Hewett, P. L. (2005). Home alone: Disasters, mass emergencies and children in self-care. Journal of Emergency Management. Journal of Emergency Management. (Vol. 3, No.2).

Pincha, C. (2008). Gender sensitive disaster management: a toolkit for practitioners. n.a.: Earthworm Books.

PLANAT. (2015). Praxiskoffer Risikodialog Naturgefahren: Tipps und praktische Hilfsmittel, um über Naturgefahren zu informieren. Für Behörden und Fachstellen. abgerufen unter: http://www.planat.ch, am 29.05.2018.

PLANAT. (2018). abgerufen unter: www.planat.ch, am 29.05.2018.

Rios Diaz, F., & Marin Ferrer, M. (2018). Loss Database Architecture for Disaster Risk Management EUR 29063 EN: Publication Office of the European Union, Luxembourg.

Rogers, R. W. (1975). A Protection Motivation Theory of Fear Appeals and Attitude Change1. The Journal of Psychology, 91(1), 93–114. https://doi.org/10.1080/00223980.1975.9915803

Rufat, S., Tate, E., Burton, C. G., & Maroof, A. S. (2015). Social vulnerability to floods: Review of case studies and implications for measurement. International Journal of Disaster Risk Reduction, 14, 470–486. https://doi.org/10.1016/j.ijdrr.2015.09.013

Schmid, F., Fraefel, M., & Hegg, C. (2004). Unwetterschäden in der Schweiz 1972 bis 2002: Verteilung, Ursachen, Entwicklung. Wasser Enerie Luft. (1/2), 21–28.

Schneiderbauer, S., Kruse, S., Kuhlicke, C., & Abeling, T. (2016). Resilienz als Konzept in Wissenschaft und Praxis. In Atlas der Verwundbarkeit und Resilienz - Pilotausgabe zur Deutschland, Österreich, Liechtenstein und Schweiz (pp. 22–25). Köln und Bonn,

Smith, S. M., Tremethick, M. J., Johnson, P., & Gorski, J. (2009). Disaster planning and response: considering the needs of the frail elderly. International Journal of Emergency Management. (Volume 6, Issue 1).

Steinführer, A., Delli Zotti, G., Del Zotto, M., Marchi, B. de, Fernandez-Bilbao, A., Kuhlicke, C., Scolobig, A., Tapsell, S., & Tunstall, S. (2009). Communities at risk: vulnerability, resilience and recommendations for flood risk management: FLOODsite report T11-07-15. abgerufen unter: http://www.floodsite.net, am 29.05.2018.

Steinführer, A., & Kuhlicke, C. (2008). Social vulnerability and the 2002 flood: country report Germany (Mulde River).: FLOODsite Report T11-07-08.

Sturm, M., Gems, B., Aufleger, M., Mazzorana, B., Papathoma-Köhle, M., & Fuchs, S. (2017). Scale model measurements of impact forces on obstacles induced by bed-load transport pro-cesses. In 37th IAHR World Congress (Ed.), E-proceedings of the 37th IAHR World Congress (pp. 1–10).

Suda, J., Holub, M., Hübl, J., Jaritz, W., Starl, H., & Rudolf-Miklau, F. (2012). Gefährdungs- und Schadensbilder für Gebäude. In J. Suda & F. Rudolf-Miklau (Eds.), Bauen und Naturgefahren (pp. 71–117). Vienna: Springer Vienna. https://doi.org/10.1007/978-3-7091-0681-5_3

Terry, G. (2009). Climate Change and Gender Justice. Oxford, UK: Practical Action Publishing in association with Oxfam GB.

Thieken, A. H., Kienzler, S., Kreibich, H., Kuhlicke, C., Kunz, M., Mühr, B., Müller, M., Otto, A., Petrow, T., Pisi, S., & Schröter, K. (2016). Review of the flood risk management system in Germany after the major flood in 2013. Ecology and Society, 21(2). https://doi.org/10.5751/ES-08547-210251

UNDP. (2010). Guide to Gender-Aware Poste-Disaster Needs Assessment.

UNISDR. (2017a). Terminology - Resilience. abgerufen unter: https://www.unisdr.org, am 29.05.2018.

UNISDR. (2017b). Terminology - Vulnerability. abgerufen unter: https://www.unisdr.org, am 29.05.2018.

UNISDR. (2017c). Terminology - Disaster loss database. abgerufen unter: http://preventionweb.net, am 29.05.2018.

UNISDR (2017d). Resolution A/71/644, UN General Assembly 2 February 2017.

UNISDR (2017e). 5th Global Platform for Disaster Risk Reduction (Mexico, 22-26 May 2017). abgerufen unter: https://www.unisdr.org, am 29.05.2018.

UNISDR. (2017f). Build Back Better in recovery, rehabilitation and reconstruction: consultative version. abgerufen unter: https://www.unisdr.org, am 29.05.2018.

UNISDR (2015). Sendai Framework for Disaster Risk Reduction 2015-2030, UNISDR 2015.

UNISDR, UNDP, IUCN. (2009). Making Disaster Risk Reduction Gender-Sensitive: Policy and Practical Guidelines. Geneva, Switzerland. abgerufen unter: https://www.unisdr.org, am 29.05.2018.

Weber, K., Damyanovic, D., Promper, C., & Patek, M. (in Press). Geschlechtsspezifische Ansätze im Naturgefahrenmanagement. In F. Rudolf-Miklau & A. Kanonier (Eds.), Regionale Risiko Governance: Recht, Politik und Praxis: Staatliche Steuerungsinstrumente und gesellschaftliche Aushandlungsprozesse im Umgang mit Naturgefahrenrisiken.

Weber, K. (2015). Landschaftsplanerische Betrachtung des Umgangs mit Naturgefahren aus genderspezifischer Perspektive: Am Fallbeispiel des Murenabganges in St. Lorenzen im Paltental 2012 (Diplom/Masterarbeit). Universität für Bodenkultur, Wien, Wien.

Weichselgartner, J. (2016). Verwundbarkeit als Konzept in Wissenschaft und Praxis. In Atlas der Verwundbarkeit und Resilienz - Pilotausgabe zur Deutschland, Österreich, Liechtenstein und Schweiz (pp. 18–21). Köln und Bonn,

Wirtz, A., Kron, W., Löw, P., & Steuer, M. (2014). The need for data: natural disasters and the challenges of database management. Natural Hazards, 70(1), 135–157. https://doi.org/10.1007/s11069-012-0312-4

Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2004). At risk: Natural hazards, people's vulnerability, and disasters. Second edition (2nd ed.). London, New York: Routledge.

WSL. (2018). Unwetterschadens-Datenbank. abgerufen unter: https://www.wsl.ch, am 29.05.2018.

Www.citizen-science.at. (2018). Österreich forscht: www.citizen-science.at. abgerufen unter: www.citizen-science.at, am 29.05.2018.

ZAMG. (2018). Erfassung und Beurteilung Schaden verursachender Unwetterereignisse, Monatsrückblick. abgerufen unter: http://www.zamg.ac.at

ZAMG, BMBWF, & UNISDR. (2018). ASDR: Austrian Strategy for Disaster Risk Reduction. abgerufen unter: http://www.isdr.at, am 29.05.2018.

StartClim2016.D

Baldacchino, F., F. Bussola, D. Arnoldi, M. Marcantonio, F. Montarsi, G. Capelli, R. Rosa and A. Rizzoli (2017). "An integrated pest control strategy against the Asian tiger mosquito in northern Italy: a case study." Pest Management Science 73(1): 87-93.

Becker, N., S. Schon, A. M. Klein, I. Ferstl, A. Kizgin, E. Tannich, C. Kuhn, B. Pluskota and A. Jost (2017). "First mass development of Aedes albopictus (Diptera: Culicidae)-its surveillance and control in Germany." Parasitology Research 116(3): 847-858.

Bonizzoni, M., G. Gasperi, X. G. Chen and A. A. James (2013). "The invasive mosquito species Aedes albopictus: current knowledge and future perspectives." Trends in Parasitology 29(9): 460-468.

Caminade, C., J. M. Medlock, E. Ducheyne, K. M. McIntyre, S. Leach, M. Baylis and A. P. Morse (2012). "Suitability of European climate for the Asian tiger mosquito Aedes albopictus: recent trends and future scenarios." Journal of the Royal Society Interface 9(75): 2708-2717.

Carrieri, M., P. Angelini, C. Venturelli, B. Maccagnani and R. Bellini (2012). "Aedes albopictus (Diptera: Culicidae) Population Size Survey in the 2007 Chikungunya Outbreak Area in Italy. II: Estimating Epidemic Thresholds." Journal of Medical Entomology 49(2): 388-399.

Cunze, S., L. K. Koch, J. Kochmann and S. Klimpel (2016). "Aedes albopictus and Aedes japonicus - two invasive mosquito species with different temperature niches in Europe." Parasites & Vectors 9.

Cunze, S., J. Kochmann, L. K. Koch and S. Klimpel (2016). "Aedes albopictus and its environmental limits in Europe." Plos One 11(9).

Di Luca, M., L. Toma, F. Severini, D. Boccolini, S. D'Avola, D. Todaro, A. Stancanelli, F. Antoci, F. La Russa, S. Casano, S. D. Sotera, E. Carraffa, V. Versteirt, F. Schaffner, R. Romi and A. Torina (2017). "First record of the invasive mosquito species Aedes (Stegomyia) albopictus (Diptera: Culicidae) on the southernmost Mediterranean islands of Italy and Europe." Parasites & Vectors 10.

Ferreira-de-Lima, V. H. and T. N. Lima-Camara (2018). "Natural vertical transmission of dengue virus in Aedes aegypti and Aedes albopictus: a systematic review." Parasites & Vectors 11.

Flacio, E., L. Engeler, M. Tonolla and P. Muller (2016). "Spread and establishment of Aedes albopictus in southern Switzerland between 2003 and 2014: an analysis of oviposition data and weather conditions." Parasites & Vectors 9.

Folmer, O., M. Black, W. Hoeh, R. Lutz and R. Vrijenhoek (1994). "DNA primers for amplification of mitochondrial cytochrome c oxidase subunit I from diverse metazoan invertebrates." Molecular marine biology and biotechnology 3(5): 294-299.

Goubert, C., H. Henri, G. Minard, C. V. Moro, P. Mavingui, C. Vieira and M. Boulesteix (2017). "High-throughput sequencing of transposable element insertions suggests adaptive evolution of the invasive Asian tiger mosquito towards temperate environments." Molecular Ecology 26(15): 3968-3981.

Kampen, H., C. Kuhlisch, A. Frohlich, D. E. Scheuch and D. Walther (2016). "Occurrence and spread of the invasive Asian bush mosquito Aedes japonicus japonicus (Diptera: Culicidae) in West and North Germany since Detection in 2012 and 2013, Respectively." Plos One 11(12).

Manica, M., R. Rosa, A. della Torre and B. Caputo (2017). "From eggs to bites: do ovitrap data provide reliable estimates of Aedes albopictus biting females?" Peerj 5.

Medlock, J. M., K. M. Hansford, V. Versteirt, B. Cull, H. Kampen, D. Fontenille, G. Hendrickx, H. Zeller, W. Van Bortel and F. Schaffner (2015). "An entomological review of invasive mosquitoes in Europe." Bulletin of Entomological Research 105(6): 637-663.

Paupy, C., H. Delatte, L. Bagny, V. Corbel and D. Fontenille (2009). "Aedes albopictus, an arbovirus vector: From the darkness to the light." Microbes and Infection 11(14-15): 1177-1185.

Poletti, P., G. Messeri, M. Ajellii, R. Vallorani, C. Rizzo and S. Merler (2011). "Transmission potential of Chikungunya virus and control measures: the case of Italy." Plos One 6(5).

Rezza, G. (2012). "Aedes albopictus and the reemergence of Dengue." Bmc Public Health 12.

Schaffner, F., J. M. Medlock and W. Van Bortel (2013). "Public health significance of invasive mosquitoes in Europe." Clinical Microbiology and Infection 19(8): 685-692.

Seidel, B., F. Montarsi, H. P. Huemer, A. Indra, G. Capelli, F. Allerberger and N. Nowotny (2016). "First record of the Asian bush mosquito, Aedes japonicus japonicus, in Italy: invasion from an established Austrian population." Parasites & Vectors 9.

Seidel, B., N. Nowotny, T. Bakonyi, F. Allerberger and F. Schaffner (2016). "Spread of Aedes japonicus japonicus (Theobald, 1901) in Austria, 2011-2015, and first records of the subspecies for Hungary, 2012, and the principality of Liechtenstein, 2015." Parasites & Vectors 9.

Velo, E., P. Kadriaj, K. Mersini, A. Shukullari, B. Manxhari, A. Simaku, A. Hoxha, B. Caputo, L. Bolzoni, R. Rosa, S. Bino, P. Reiter and A. della Torre (2016). "Enhancement of Aedes albopictus collections by ovitrap and sticky adult trap." Parasites & Vectors 9.

Wagner, S., A. Mathis, A. C. Schonenberger, S. Becker, J. Schmidt-Chanasit, C. Silaghi and E. Veronesi (2018). "Vector competence of field populations of the mosquito species Aedes japonicus japonicus and Culex pipiens from Switzerland for two West Nile virus strains." Medical and Veterinary Entomology 32(1): 121-124.

Zittra, C., A. Joachim and H. P. Fuehrer (2015). "Mosquitoes and Dirofilaria in Austria - a review of the current situation of neobiotic Culicidae and Dirofilariae." Tieraerztliche Umschau 70(4): 126-131.

Zittra, C., A. G. Obwaller, V. Wimmer, D. Berer, B. Eigner and H. P. Fuehrer (2017). "First record of Orthopodomyia pulcripalpis (Rondani, 1872) (Diptera: Culicidae) in Austria." Parasitology Research 116(6): 1781-1783.

7 List of Figures

Annex
The following projects were part of StartClim2010 to StartClim2016. All StartClim reports can be found online on the StartClim webpage (www.startclim.at).

Contributions to StartClim2010

StartClim2010.A: Fields of action and responsible actors for climate change adaptation of public parks in cities
Institute of Landscape Development, Recreation and Conservation Planning (ILEN), BOKU: Stephanie Drlik, Andreas Muhar

StartClim2010.B: Recommendations for an adaptation of urban open and green spaces in Austrian cities and city regions
PlanSinn GmbH, Office for Planning and Communication: Erik Meinharter
Federal Environment Agency: Maria Balas

StartClim2010.C: The social costs of adaptation: approaches to an evaluation of adaptation options (SALDO)
Wegener Center for Climate and Global Change, University Graz: Birgit Bednar-Friedl, Olivia Koland, Janine Raab
Federal Environment Agency: Martin König

StartClim2010.D: Integrated precautionary and adaptation measures for the Marchfeld region
Institute for Sustainable Economic Development, BOKU: Christine Heumesser, Mathias Kirchner, Erwin Schmid, Franziska Strauss

StartClim2010.E: Ecological and silvicultural characteristics of European larch (Larix decidua Mill.) – consequences for forest management in Austria in consideration of climate change
Institute of Silviculture, BOKU: Eduard Hochbichler, Gabriele Wolfslehner, Roland Koeck, F. Arbeiter
Federal Research and Training Centre for Forests, Natural Hazards and Landscape: Herfried Steiner, Georg Frank
Institute of Meteorology, BOKU: Herbert Formayer

Startclim2010.F: Hot town, summer in the city – effects of hot days on recreational and leisure behaviour and sightseeing programmes of city tourists as exemplified by the case of Vienna
Institute of Landscape Development, Recreation and Conservation Planning (ILEN), BOKU: Christiane Brandenburg, Brigitte Allex, Ursula Liebl, Christina Czachs
Institute of Meteorology, BOKU: Thomas Gerersdorfer

StartClim2010.G: Knowledge-based platform to optimise operations strategies in handling natural hazards
Austrian Red Cross: Jürgen Högl, Clemens Liehr, Gerry Foitik
Institute of Production and Logistics, BOKU: Manfred Gronalt, Magdalena Schweiger, Patrick Hirsch

Contributions to StartClim2011

StartCim2011.A: Climatic influence on voltinism and spread of the spruce bark beetle, Ips typographus, in alpine areas
Institute of Forest Entomology, Forest Pathology & Forest Protection, BOKU: Axel Schopf, Emma Blackwell, Veronika Wimmer

StartClim2011.B: Analyzing Austria's forest disturbance regime as basis for the development of climate change adaptation strategies
Institute of Silviculture, BOKU: Rupert Seidl, Dominik Thom
Institute of Forest Protection, Federal Research and Training Center for Forests, Natural Hazards, and Landscape (BFW): Hannes Krehan, Gottfried Steyrer

StartClim2011.C: Effects of soil drying on the transpiration of Austrian tree species
University of Innsbruck: Georg Wohlfahrt, Stefan Mayr, Christoph Irschick, Sabrina Obwegeser, Petra Schattanek, Teresa Weber, Dorian Hammerl, Regina Penz

StartClim2011.D: Adapting Austrian forestry to climate change: Assessing the drought tolerance of Austria's autochthonous tree species
Institute of Botany, BOKU: Gerhard Karrer, Gabriele Bassler
Institute of Forest Ecology, BOKU: Helmut Schume, Bradley Matthews
Vienna Institute for Nature Conservation and Analyis, V.I.N.C.A: Wolfgang Willner

Contributions to StartClim2012

StartClim2012.A: Cover crops as a source or sink of soil greenhouse gas emissions?
Division of Agronomy, Department of Crop Sciences, BOKU: Gernot Bodner, Andreas Klik, Sophie Zechmeister-Boltenstern

StartClim2012.B: Effects of climate change on soil functions: metadata analysis
Federal Research and Training Centre for Forests, Natural Hazards, and Landscape (BFW): Michael Englisch, Barbara Kitzler, Kerstin Michel, Michael Tatzber
Federal Agency for Water Management, Institute for Land & Water Management Research (BAW-IKT): Thomas Bauer, Peter Strauss
Austrian Agency for Health and Food Safety (AGES): Andreas Baumgarten, Hans-Peter Haslmayr
Federal Environment Agency: Alexandra Freudenschuß

StartClim2012.C: Disturbance of forest stands and humus loss
Institute of Forest Ecology, BOKU: Douglas Godbold, Mathias Mayer, Boris Rewald

StartClim2012.D: To count with and on wood: adaptations of tools and data (German: Holz BZR)
Kompetenzzentrum Holz GmbH: Tobias Stern, Franziska Hesser, Georg Winner, Sebastian Koch
Institute of Marketing and Innovation, BOKU: Leyla Jazayeri-Thomas, Verena Aspalter, Martin Braun, Wolfgang Huber, Peter Schwarzbauer
Institute of Wood Science and Technology, BOKU: Robert Stingl, Marie Louise Zukal, Alfred Teischinger
Federal Environment Agency: Peter Weiss, Alexandra Freudenschuß

StartClim2012.E: Snow line climatology within the Alpine region, derived from re-analysis data
Institute of Meteorology, BOKU: Herbert Formayer, Imran Nadeem

StartClim2012.F: Values as performance indicators: a path towards a proactive climate protection
Centre for Global Change and Sustainability, BOKU: Maria Miguel Ribeiro, Julia Buchebner

Contributions to StartClim2013

StartClim2013.A: Thermal stress for brown trout in the headwaters of the river Traun during summer
Harald Ficker, M.Sc.

StartClim2013.B: Loss of floodplains and flood risk in the context of climate change

Institute of Water Management, Hydrology and Hydraulic Engineering, BOKU: Helmut Habersack, Bernhard Schober, Daniel Haspel

StartClim2013.C: Runoff scenarios in the Ötztal valley (Tyrol, Austria) considering changes to the cryosphere as a result of climate change
alpS GmbH: Matthias Huttenlau, Katrin Schneider, Kay Helfricht, Klaus Schneeberger
Institute of Meteorology, BOKU: Herbert Formayer

StartClim2013.D: Recommendations for changes to regional development and spatial planning in areas of high flood risk
PlanSinn GmbH - Office for Planning & Communication: Bettina Dreiseitl-Wanschura, Erik Meinharter, Annemarie Sulzberger
Rambøll Group: Herbert Dreiseitl
Federal Environment Agency GmbH: Theresa Stickler, Jochen Bürgel

StartClim2013.E: How and where will Austrian river systems respond to climate change? An interdisciplinary analysis of fish fauna and nutrients
Institute of Hydrobiology and Aquatic Ecosystem Management, BOKU: Thomas Hein, Andreas Melcher, Florian Pletterbauer
Department of Integrative Zoology, University of Vienna: Irene Zweimüller

StartClim2013.F: GIAClim – Gender Impact Assessment in the context of climate change adaptation and natural hazards
Institute of Landscape Planning, BOKU: Doris Damyanovic, Florian Reinwald, Britta Fuchs, Eva Maria Pircher
Institute of Landscape Development, Recreation and Conservation Planning, BOKU: Christiane Brandenburg, Brigitte Allex
Institute of Mountain Risk Engineering, BOKU: Johannes Hübl, Julia Eisl

StartClim2013.G: Validation of the applicability of the SIMAGRIO-W wireworm prognosis model, based on soil temperature and moisture measurements, in Eastern Austrian agriculture
Bio Forschung Austria: Patrick Hann, Katharina Wechselberger, Rudi Schmid, Claus Trska, Birgit Putz, Markus Diethart, Bernhard Kromp
Zentralstelle der Länder für EDV-gestützte Entscheidungshilfen und Programme im Pflanzenschutz (ZEPP): Jeanette Jung
Institute of Meteorology, BOKU: Josef Eitzinger

Contributions to StartClim2014

StartClim2014.A: SNORRE - Screening of remarkable weather
Zentralanstalt für Meteorologie und Geodynamik (ZAMG): Christoph Matulla, Brigitta Hollosi
Federal Environment Agency: Maria Balas

StartClim2014.B: Developing a method for assessing climate change effects on productivity and animal welfare as well as adaptation potential of livestock husbandry
Institute of Livestock Sciences, BOKU: Stefan Hörtenhuber, Werner Zollitsch

StartClim2014.C: Effects of ambient temperature on performance and health traits in dairy cattle when considering husbandry factors
Institute of Livestock Sciences, BOKU: Birgit Fürst-Waltl, Verena Auer
ZuchtData EDV-Dienstleistungen GmbH: Christa Egger-Danner, Franz Steininger
Institute of Meteorology, BOKU: Herbert Formayer, David Leidinger
Höhere Bundeslehr- und Forschungsanstalt für Landwirtschaft Raumberg-Gumpenstein: Elfriede Ofner-Schröck, Eduard Zentner
LKV Austria: Karl Zottl

StartClim2014.D: On the importance of climate change for nutrition and diseases of alpine game
Gesellschaft für Wildtier und Lebensraum (GWL): Armin Deutz, Gunther Greßmann
Höhere Bundeslehr- und Forschungsanstalt für Landwirtschaft Raumberg-Gumpenstein: Thomas Guggenberger, Albin Blaschka

StartClim2014.E: Weather-independent tourism offers based on Nature experience offers - relevance and innovative development options
Institute of Landscape Development, Recreation and Conservation Planning, BOKU: Ulrike Pröbstl-Haider, Verena Melzer

StartClim2014.F: permAT – Long-term monitoring of permafrost and periglacial processes and its role for natural hazard prevention: Possible strategies for Austria
Department of Geography and Regional Science, University of Graz: Andreas Kellerer-Pirklbauer, Christoph Gitschthaler, Michael Avian
Zentralanstalt für Meteorologie und Geodynamik (ZAMG): Annett Bartsch, Stefan Reisenhofer, Gernot Weyss, Claudia Riedl

Contributions to StartClim2015

StartClim2015.A: Re-inventing prevention? - An analysis and evaluation of approaches and tools for flood and heavy precipitation self-provision and private prevention (RE-Invent)
Institut für Interdisziplinäre Gebirgsforschung IGF, Österreichische Akademie der Wissenschaften: Axel Borsdorf, Stefanie Rohland
Wegener Center für Klima und Globalen Wandel, Universität Graz: Philipp Babcicky, Sebastian Seebauer
Landesfeuerwehrverband Vorarlberg: Clemens Pfurtscheller

StartClim2015.B: RELOCATE – Relocation of flood-prone households in the Eferding basin: Accompanying research on social impacts
Wegener Center für Klima und Globalen Wandel, Universität Graz: Philipp Babcicky,
Sebastian Seebauer

StartClim2015.C: Monitoring the effects of climate change on the Austrian bird fauna
BirdLife Österreich: Erwin Nemeth, Norbert Teufelbauer
Zentralanstalt für Meteorologie und Geodynamik (ZAMG): Ingeborg Auer, Brigitta Hollòsi

StartClim2015.D: Maintaining the protective services in Austrian forests under conditions of climate change
Institut für Waldbau, BOKU: Manfred Lexer, Florian Irauschek, Werner Rammer

StartClim2015.E: Risk assessments for selected protection forest types of the Eastern Alps (Austria and Southern Tyrol) with reference to the disturbance regimes storm/snow damage/drought - bark beetle– forest fire and climate change
Institut für Forstentomologie, Forstpathologie und Forstschutz, BOKU: Axel Schopf, Peter Baier,
Sigrid Netherer, Josef Pennerstorfer

Contributions to StartClim2016

StartClim2016.A: Monitoring to assess biodiversity effects of climate change
Umweltbundesamt GmbH: Stefan Schindler, Franz Essl, Wolfgang Rabitsch, Maria Stejskal-Tiefenbach

StartClim2016.B: Impact of climate change on the activity phases of animals using the example of amphibians in Austria and the use of plant phenology as an indicator
Institut für Landschaftsentwicklung, Erholungs- und Naturschutzplanung, BOKU: Christina Czachs, Christiane Brandenburg, Birgit Gantner, Manfred Pintar, Caren Hanreich
Institut für Meteorologie, BOKU: Erich Mursch-Radlgruber

StartClim2016.C: BioRaw
Bundesforschungs- und Ausbildungszentrum für Wald, Naturgefahren und Landschaft: Michael Englisch, Robert Jandl, Rainer Reiter
Umweltbundesamt GmbH: Andreas Bartel, Rosemarie Stangl, Gerhard Zethner, Helmut Gaugitsch, Wolfgang Lexer

StartClim2016.D: Raising awareness as driver of social transformation in the context of climate change? How local and regional authorities raise awareness about climate change in the frame of e5 and KEM initiatives.
Österreichisches Institut für Raumplanung: Ursula Mollay, Joanne Tordy
MSC SORA: Evelyn Hacker, Florian Oberhuber

StartClim2016.E: Detection of bark beetle infestation using an unmanned aerial vehicle (UAV)
Institut für Vermessung, Fernerkundung und Landinformation, BOKU: Markus Immitzer, Kathrin Einzmann, Clement Atzberger

StartClim2016.F: Migration, climate change and social and economic inequalities
Ludwig Boltzmann Institut für Menschenrechte: Monika Mayrhofer, Margit Ammer