# Annual reporting 2017: Nordic Centre of Excellence (NCoE) in the Nordic Societal Security Program

## Report Headings:

### Original aims:

NORDRESS AIMS TO

- **Enhance societal resilience in a wide spectrum covering individual, community, infrastructure, and institutional resilience,** through defined interdisciplinary research projects, emphasizing cooperation between different NORDIC institutions.
- **Create a lasting interdisciplinary platform for sharing ideas and knowledge among many of the best scientists and experts on natural hazards in the Nordic countries**, most of whom have not worked together before.
- **Improve the opportunities of the NORDRESS partners to obtain funding** from other agencies and thus have an **impact on scientific progress**.
- **Improve networking, education and training** through **The Nordic Societal Security Academy (NSSA)**, which administers a quarter of the NordForsk grant.
- More specifically, **each of the 13 WP tasks has its aims, stated in the original project description.**

### Design and methods:

NORDRESS is arranged into 2 administrative and 4 research WPs, each of which is further subdivided into Tasks. Each of these has its own approach, design and methods. NORDRESS employs sound scientific methods in every field and emphasizes a cross-disciplinary approach. Particular emphasis is placed on cooperation between institutions in more than one Nordic country, both for transfer of knowledge and to create networks that will last beyond the scope of NORDRESS itself.

### Practical changes to original plan:

No major changes have occurred in the project per se, although some proposed staff members in the WPs changed jobs and were replaced by others, and a couple of WPs merged last year.

In the annual report 2016 we explained the serious impact of the development of exchange rates between the Icelandic and Norwegian currencies, with the latter losing about half of its value since the budget was made in 2014. This unfortunate state still prevails, greatly reducing the workhours or other expenses that the grant can cover.

### Personnel of the NCoE: (Table 1)

### Detailed research progress:

**NORDRESS is a multifaceted project aiming at increasing societal security and resilience from the viewpoints of individuals (WP3), communities (WP4), infrastructure (WP5), and institutions (WP6). With the issues mentioned above in mind, we will describe briefly the progress made in 2017 in these WPs as well as the work on Administration (WP1) and the Nordic Societal Security Academy (WP2). We apologize for the length of the text, but the scope and complexity of the project call for more than the stipulated 4 pages.**

**WP1 ADMINISTRATION** manages the entire CoE, distributes funds and follows the progress of all WPs, providing information and advice as needed. As before, WP1 introduced NORDRESS in various fora, searched for cooperation opportunities outside of NORDRESS and prepared grant applications to national and international funds. WP1 hosted the second annual meeting successfully held in Reykjavík on August 22 2017, and attended the meeting with the Scientific Advisory Board in Copenhagen on June 19-2017. WP1 prepares all official reports and documents, including the annual report.
By far the largest task of the year was preparing and hosting the 8th IDRiM conference, which NORDRESS held in cooperation with the International Society for Integrated Disaster Risk Management. The conference took place in Reykjavik on August 23-25 2017 and was attended by 216 registered participants from 28 countries, thereof 40 NORDRESS members. This event gave ample opportunities for communication and networking far beyond the NORDRESS boundaries.
The program contained 29 oral sessions, with up to 6 presentations each, 5 plenary invited lectures, plenary panel discussions, and poster sessions. Special emphasis was placed on giving young scientists a voice, by offering three special sessions (YSS) designated to them. Iceland´s leading TV news editor, Ms Þóra Arnórsdóttir, conducted plenary interviews with selected experts on different aspects of disasters and resilience. This new feature in the IDRiM conference program proved to be very successful in clarifying the relevance of the experts´ work, making it understandable to the general audience. Last but not least, the program included a field trip to South-Iceland, a region challenged by a variety of natural threats, including volcanic eruptions, earthquakes, and glacial river- and ocean floods. The local emergency managers hosted a meeting in the community hall and gave very informative and useful presentations on emergency preparation and response in the region.

The scientific program was of high quality and brought together a wide selection of experts on all aspects of natural disasters, risk, and resilience, ranging from safety practitioners, politicians, NGOs, health service providers, public health organizers, teachers, media people, transportation organizers, experts on data and informatics, to academics in all fields relevant for safety and societal resilience.

The conference program, all abstracts, and a list of all participants can be viewed on the website www.idrim2017.com

Of the 245 abstracts accepted, 38 came from NORDRESS, with 35 oral presentations and 3 posters. We feel that by hosting and taking an active part in IDRiM2017, NORDRESS has met many of the requirements regarding cross-disciplinary work, cooperation with non-Nordic partners, broad dissemination and outreach.

**WP2 The NORDIC SOCIETAL SECURITY ACADEMY (NSSA)** continued to be a great success as a source of mobility and cooperation. It provides motivation for the partners to arrange courses and workshops, and for students and researchers to visit other partners.

In 2017 NSSA received 27 applications for mobility grants. All applications met the required standards and were funded. While many funded activities took place in 2017, others are planned for 2018.
NSSA acts as a great motivator for cooperation in the consortium, as the funded activities generally involve partners from more than one institution and country. The grants also provide opportunities for the WPs to organise workshops to discuss and plan their work, often with extraneous experts – in some cases several WPs join to host a workshop. Thus the NSSA has fuelled cooperation between and beyond our partner institutions, building trust, strengthening the network and opening opportunities for transfer of knowledge and sharing of technical equipment.

**WP3 Individual Resilience**
The team, that consists of experts in Iceland, Denmark, Norway and Sweden, had set out goals for various tasks in 2017. In the task on the Eyjafjallajökull volcano studies the aim was to submit 2 papers for publication in peer reviewed journals, one on mental health following the volcanic eruption, and another on children´s health following the eruption. Both papers were submitted in 2017, but only printed in 2018 and will therefore be included in 2018 annual report. Ethical approval has been obtained for further studies, registry data has been obtained and statistical analysis has begun.
Regarding snow avalanches, a study on sleep disorders among avalanche survivors is well underway and preliminary results have been presented.
Similarly, a study on tsunami survivors and sleep disorders has progressed well and preliminary results have been presented.
As the task on psychological support and PTSD is concerned, the aim of submitting a manuscript was fulfilled. The paper will be published in spring 2018 in the International Journal of Disaster Risk Reduction.
A Literature review report was published: Psycho-social interventions following disasters in the Nordic countries, policies and research.
And our partners at the Psychological Crises Centre in Norway published a paper in the European Journal of Psychotraumatology on Communicating with children and adolescents about the risk of natural disasters.
Finally, a paper on psychological health following the earthquakes in Iceland in 2000 and 2008 has been accepted for publication in the Scandinavian Journal of Public Health.

**WP4 Community resilience**
WP4 explores the role of communities in societal resilience to natural hazards
Substantial progress has been made with respect to generating understanding of social, economic, cultural and political factors affecting people's decision-making during a crisis, particularly with respect to efficient and timely communication of natural hazard risk.
Activities in WP 4.1 in 2017 focused mainly on data collection on community resilience in Finland and Norway.
In Finland two flood-prone communities (Kittilä and Rovaniemi) were studied by Post Doc Aleksi Räsänen and MSc Student Vera Kauppinen from the University of Helsinki. They carried out semi-structured interviews, analyses of policy documents as well as household surveys. The data has been analyzed and preliminary findings were presented at seminars at NTNU in Trondheim and at the IDRiM2017 conference in Reykjavik.
Also in Finland, Atte Harjanne cooperated with the Finnish National Rescue Association in developing and analysing a survey regarding the preparedness and perceptions of the summer storm in Kiira Finland.
In Norway the focus of activities in 2017 was on exploring the role of local knowledge and local communities in disaster management. This work was carried out in collaboration with

the Norwegian Research Council funded ClimRes project. Much of the work was carried out by MSc students writing their theses based on fieldwork in various small communities. In addition, PhD student Silje Aurora Andresen continued her studies on the 2014 Lærdal fire and the role played by the local community and local knowledge during and after the fire. Preliminary findings from the work in Norway were presented in various conferences (see Table 4).

In 2017 WP4.2 devoted a lot of effort to the preparation of the Open Access book, Volcano Crisis Communication which will be published in the summer of 2018 by Springer as part of the Advances in Volcanology series. The book contains a total of 43 chapters on crisis communication, covering a multitude of volcanic environments from around the world and including chapters written by experts in the fields of volcanology, communicating uncertainty, factors that affect decision-making, the use of social media, and the application of participatory methods for developing risk mitigation strategies (i.e., those that reflect community needs and aspirations with respect to the social, economic, cultural and political context).
Other WP4.2 activities include the study on the community response to the Eyjafjallajökull eruption in 2010. Data entry and analysis has been finalised and manuscript preparation is nearing completion. Interviews undertaken in the area in 2016 have been transcribed (supported by NSSA mobility grant). Simultaneously, data entry and analysis from a survey focusing on risk communication, implemented during the IDRIM conference in Reykjavik, has been completed and added to data collected by Bird and Gisladottir in 2007 and 2009. A publication on these is in preparation. We capitalized on the excellent networking opportunities during the NORDRESS annual meeting in Reykjavik, as well as ECCA in Glasgow in June and IDRIM in Reykjavik in August. Cooperation with agents outside NORDRESS is ongoing, including academics from universities in Australia (e.g. Monash University, Macquarie University, Charles Darwin University), United Kingdom (University College of London) and the United States (New York University, Denison University) and non-academic experts from various Australian agencies (e.g. Australian Red Cross, Emergency Management Victoria, State Emergency Service and Bureau of Meteorology). External capacity building has been undertaken through supervision of PhD students, including one from each University of Iceland, Macquarie University, Australian National University and Monash University.
WP4.3 focused on developing further the Nordic framework for web-based natural hazard early warning and monitoring system, and a paper has been accepted for publication in the International Journal of Disaster Risk Reduction.
Linked to this, WP4.3 organized a visit to the EDUCEN final conference in Dordrecht (NL) on March 29-31 2018, with 5 participants from WP4.1, WP4.2 and WP4.3, to collect and discuss results of the EDUCEN project on cities, cultures and catastrophes with insight into safety strategies of cities and multi-layer strategies for dealing with flood protection and flood risk management.
Lisa van Well form the Swedish Geophysical Institute (SGI) organized a special NORDRESS session at ECCA 2017 - “Constituting Local Knowledge of Natural Disasters in Climate Adaptation”. This activity helped build capacity in a number of SGI’s projects regarding the use of local knowledge and stakeholder interests. For instance, NORDRESS contributed to a successful project application to ERA4CS network (JPI Climate) lead by NGI with SGI as partner and WP leader. Also, the project EVOKED “Enhancing the value of climate data – translating risk and uncertainty utilizing a Living Labs approach” has been inspired by much of the discussion taking place in WP4.2. NORDRESS results also contributed to the project application to the Swedish Research Fund ( FORMAS), on Climate Adaptation by Managed Realignment (CAMEL).

Lisa Van Well lead the writing of a paper on territorial governance of natural hazards in the Nordic countries, which is to be published in a special issue of the International Journal of Disaster Risk Reduction in 2018. The paper is based on work done in WP6.1, but SGI added the theoretical framework and reanalysis of the WP6.1 results.

**WP5 Infrastructure resilience**

The NORDRESS funding for WPs 5.1 and 5.2 on transportation infrastructure threatened by landslides and avalanches was essentially finished in 2016. Activities charged to NORDRESS used remaining funds from previous 2 years and/or were in-kind contribution of the partners. The main work done in 2017 was participation in the annual NORDRESS meeting and IDRiM 2017 conference in Reykjavik in August 2017, as well as completing and finalizing the NORDRESS Report D5.1: "Mitigation of risk posed by slope failures on transport infrastructure – Gaps and needs", which had been issued in draft form in 2016.

The report was prepared by institutes in Norway (NGI), Sweden (SGI) and Iceland (IMO) and identifies gaps and research needs within the landslide risk management process regarding transportation infrastructure. The gaps and needs are identified through causal analysis of adverse events as well as the ensuing responses. Demonstration examples of previous events with slope failure impact on transportation infrastructure (road and railway) from Norway, Sweden and Iceland are provided in the report to support its arguments and conclusions. The report also reviews findings from research projects related to the scope of the report.

In February 2017 WP5.3 launched a vulnerability assessment tool for coastal erosion https://gis.swedgeo.se/ksi_erosion/. SGI (Sweden) had led the work with the other WP5.3 partners, mainly GEUS (Denmark) and IMO (Iceland). The Coastal Vulnerability Index (CVI) is created from two sub-indices, Costal characteristics and Societal values, and the two sub-indices can be displayed separately as well as a variety of other GIS features.

The next step will be to develop CVIs for flooding and for the combined scenario of erosion and flooding in cooperation with another research project on the ethical dimensions of sea level rise (SEA-RIMS), funded by FORMAS in Sweden, together with the Department of Philosophy at KTH, Royal Institute of Technology in Stockholm (and with linkages also to WP 4.2) .

In Denmark GEUS takes part in developing software for mapping the vulnerability for storm surges, that includes modelling of shallow groundwater levels and flood risks from rivers, based on two Danish River basins (Storå and Odense å). This software could be used to test the WP 5.3 Coastal Vulnerability Index in the Odense area.

In Iceland the IMO published an analysis of return periods of sea floods in Reykjavik and Patreksfjordur (north-west Iceland) ending a research project led by NORDRESS partner Halldor Bjornsson. He then wrote chapters on sea level rise and flooding risk in Iceland for the new climate change impact assessment for Iceland that is due to be published soon. Finally, with colleagues from the University of Iceland Halldór organized a network to apply for a center-of-excellence funding to the National Research Council of Iceland, focussing on sea level change and vertical land motion in this century. All three projects greatly benefitted from the NORDRESS collaboration, although partial NORDRESS funding was only available for the first two.

**WP5.4. deals with Arctic offshore challenges**. In 2017 it focused on a desktop study of the literature on search and rescue exercises in the Arctic, as well as on conceptual work dealing with the phenomenon of cold disaster. A peer reviewed paper on this work has been accepted. WP4.4 has also worked on the analysis of empirical data collected during LIVEX16. So far this work has resulted in the publication of one peer-reviewed journal article titled: Who is in the center? A case study of a social network in an emergency management

organization, as well as one conference paper titled: Making sense of signals, which have been presented a two conferences.

**WP5.5 deals with the vulnerability of air traffic to volcanic eruptions** In 2017 the researchers focused on dissemination and linking with professionals at conferences and events. The WP completed and submitted three articles to peer-reviewed journals as was planned and they are presently under review. The PhD student presented her work at a global Transportation Research Conference in Washington D.C., U.S.A. She spent 4 months as a visiting doctoral student at the Disaster Prevention Research Institute at Kyoto University, where she conducted interviews on the comparison between Japan and Iceland with regards to the management of Volcanic Ash. She also presented her research at Kyoto University and conducted a seminar on stakeholder workshop preparation. Furthermore, she attended the VAAC best practice workshop in Tokyo, June 9, 2017.
In the second half of 2017 she presented at the International Disaster Risk Management Conference in Reykjavik and is currently engaged in the completion of the doctoral thesis.

**WP6 Institutional Resilience**
In 2017 members of WP6 concentrated on preparing and editing a special issue for the International Journal of Disaster Reduction Research (see Table 1 for list of content), along with attending conferences and conducting research in related projects funded by others. The overarching conclusion of the guest-editors is that what civil protection in the Nordic countries has in common lies more in spirit – i.e. shared values, on governance and transparency, and in particular trust in fellow citizens and institutions – rather than concrete implementation forms. For modern civil protection to be effective and comprehensive, these characteristics are indeed more crucial than the organizational form and exact allocation of responsibilities. Trust and transparency engender an attitude and system of performance evaluation, thereby supporting social learning and continuous improvement of natural hazard risk management. There are some weaknesses, such as confusion over responsibilities, but these can be tackled by technical and organisational measures. In addition, the Nordic version of the welfare state seems to be very conducive for societal resilience.

## Governance:

The Institute for Sustainability Studies, University of Iceland is the NORDRESS **Project Manager**. Daily management lies with a 4-person **Executive board**, while the **NORDRESS Council**, consisting of one representative from each Party, has the ultimate decision-making power in the Consortium.
All partners are devoted to specific tasks within the project which is structured into 13 **workpackage tasks** (WP Task). Each WPtask has been assigned a **WP leader** who co-ordinates activities and is responsible for the work-plan of the WP task and its progress, as well as financial and scientific reports. WP leaders come from the partner institutions in all the Nordic countries, which ensures a joint Nordic representation in the management of the CoE. This governance structure has proven to be effective and problem free.

## Highlights of the research:

- A highlight of NORDRESS in 2017 is without doubt the extensive **transdisciplinary networking** that took place at the IDRiM2017 conference, where more than 200 participants from 28 countries shared their findings in 245 presentations.

- Another highlight is how well collaboration between academics and non-academics progressed in 2017, not least with civil protection agents and the Red cross. An example is the PhD project of Ingibjörg Lilja Ómarsdóttir, based on cooperation with social service and civil protection providers in hazard prone communities.
  The program of IDRiM2017 reflected this transdisciplinary emphasis, not least in the plenary lectures and panel discussions. One of the most memorable sessions of IDRiM2017 was a visit to the civil protection centre in South-Iceland to learn about how warnings were issued and evacuation carried out during the volcanic eruption of Eyjafjallajökull in 2010, and how the system has developed since. Many of the international experts voiced their admiration for the efficient cooperation between this small civil protection unit and the widely dispersed community it serves.

**Key findings:**

**Key findings/progress in 2017 include:**

- Launching a tool to assess coastal vulnerability to erosion in Sweden, that can be adapted to other coastal regions. The Coastal Vulnerability Index (CVI) is created from two sub-indices, Costal characteristics and Societal values, which can be displayed separately as well as with a variety of other GIS features.
  The next step will be to develop CVIs for flooding and for the combined scenario of erosion and flooding.

- The report "Mitigation of risk posed by slope failures on transport infrastructure – Gaps and needs", was prepared by institutes in Norway (NGI), Sweden (SGI) and Iceland (IMO). The report is based on causal analyses of adverse events as well as the ensuing responses, and is a valuable tool to identify opportunities to improve landslide risk management regarding transportation infrastructure.

- In studies on how to strengthen the aviation sector ´s resilience to volcanic ash, key stakeholders were brought together to analyse their preparedness for potential ash eruptions of far greater magnitude than the eruption in Eyjafjallajökull in 2010, which had brought European air traffic to halt for several days. Through their discussion a variety of weaknesses were identified, which gave rise to a number of policy recommendations.

**Warrant:**
As long as NORDRESS bases its research on sound and accepted scientific methods and publishes its findings in peer reviewed academic journals, a particular argumentation to support confidence in its findings should not be needed.

**Researcher mobility:** (Table 2)

**Researcher training and education:** (Table 3)

**Output and dissemination:** (Table 4)

**Meetings and networking:** (Up to two paragraphs on major meetings, conferences or other events organised by the NCoE)

NORDRESS organized an international conference IDRiM2017 in Reykjavik August 23-25 2017 in cooperation with the international Society for Integrated Disaster Risk Management. The conference was attended by 216 participants from 28 countries. See www.idrim2017.com

WP4 in NORDRESS organized a session at the 3rd European Climate Change Adaptation Conference (ECCA), Our Climate Ready Future, in Glasgow, 5th-9th June 2017 The NORDRESS session was called Constituting Local Knowledge of Natural Disasters in Climate Adaptation.

WP6.2 organized a summer course for PhD students on May 23-27 2017 in Skálholt, Iceland. The subject was Disaster Social Work: Resilience and Crisis management in the Context of Welfare States.

(Table 5)

**Infrastructure and data policy:**

NORDRESS requires solid research infrastructure, equipment and other physical facilities, as well as access to databases and opportunities to collect further data. These needs are well met, as the partners are well equipped universities and research institutions ready to provide these facilities. The NORDRESS CoE emphasizes open access to methods and results and data as appropriate. The NORDRESS website provides continuous information on the project activities. NORDRESS partners are urged to produce open reports and submit academic papers to open access depositories listed in the OpenDOOR database or published in open access journals. NORDRESS helps cover the cost of open access publications, but expects to use the open access depository method more as it carries little or no costs for the project, rather than purchase open access rights in academic journals at prohibitively high costs.

**Progress and contributions towards Program aims:**

a) **to address common Nordic Societal security issues by providing excellent, cross-disciplinary research in this field.**

NORDRESS addresses Nordic Societal Security from the viewpoint of natural hazards, not manmade or other hazards. The Nordic countries all have to meet the challenges of natural hazards, albeit to varying degrees. For geological, geographical and social reasons, natural threats may vary from one region to another, yet similar measures may be adopted to increase societal security across borders.
NORDRESS is highly cross-disciplinary and all its activities aim to increase societal security in the Nordic countries and beyond.

**I** it approaches societal security from four directions: of **individuals, communities, infrastructure and institution**s. All these are equally important to all the Nordic countries.

**II** it studies a **variety of natural hazards**, ranging from local to transboundary:
avalanches and landslides
floods from rivers, ocean and extreme weather
forest fires
threats in Arctic waters

volcanic eruptions

**III** it studies a **variety of security measures**:
Mapping, monitoring, and predicting different hazards, including public participation in monitoring.
Understanding public acceptance of and compliance with security measures, such as warnings and evacuations, and scrutinizing the assistance provided to local populations by rescue and safety agents.
Evaluating mitigation measures, such as protective structures versus temporary closure of transport lines.
Understanding risk and security measures in Arctic offshore and marine environments.
Improving stakeholder collaboration in the European air industry.
Understanding the legal and institutional framework of natural hazards in the Nordic countries.
Understanding the role of the welfare system and social services in natural hazard relief.

**IV** NORDRESS comprises a **wide variety of experts** ranging from renowned academics through civil protection agents of all kinds to local inhabitants affected by hazardous natural events. The consortium is extremely interdisciplinary.

**b) to facilitate and develop international Societal security research cooperation**

Conferences, Courses and Workshops organized by NORDRESS through the NSSA are generally open to international participation and have attracted graduate students and others from all over the world.
NORDESS members involve international partners in their work. WP3 works closely with international colleagues at Karolinska Institutet in Stockholm; WP4 has established long term collaboration with Australian experts on community resilience and natural disasters, WPs 4 and 5 held a workshop at the international conference ECCA in Glasgow in 2017, Amersfoort, NL, learning about web-based decision support systems, and WP5 has also instigated widespread cooperation between European air traffic controllers and other air industry stakeholders. Last but not least the IDRiM2017 conference hosted by NORDRESS brought together academic and non-academic experts on societal security from all over the world, and provided excellent opportunities to share findings and develop research cooperation.

**c) to mobilize and qualify researchers for participation in EU Societal security research funded by the Horizon 2020 program**

NORDRESS has certainly qualified researchers to take part in large international research programs. The partners scrutinize opportunities offered by H2020, and have taken part in exploratory meetings to prepare applications, but so far no application has come through on that front. However, other applications to EU-programs have been successful, e.g. to the Northern Periphery and Arctic Program (www.northernperiphery.eu) for a multinational project on safety at sea, App4Sea, which started in 2017.

**d) to involve users of research results (industry, policy makers, local communities etc) in the work**

NORDRESS emphasizes cooperation with end users in all its WPs. In the health sector our researchers cooperate with clinicians, both in the fields of mental and physical health. They also provide advice to local authorities, schools, media, and others on how to react to very

stressful events, such as natural disasters, with the welfare of vulnerable groups, not least children, in mind. Regarding community resilience NORDRESS collaborates with local authorities, civil protection authorities and agents, tour operators and guides, NGOs, media, and local populations. Infrastructure resilience is studied from the viewpoint of transportation including relevant authorities and engineers in the research; maritime security involves search and rescue experts, local authorities and managers of safety exercises. When it comes to aviation security NORDRESS collaborates with the European air traffic control system, air companies, engine designers and other stakeholders. Finally, studies on institutional security involve legal experts and social workers and others who have direct experience on how these systems work and need to be developed. Thus, it is safe to say that NORDRESS involves users of the research results to a high degree in its work.

e) **to disseminate the results to a wide array of stakeholders in the Nordic region and internationally;**

NORDRESS is a collaborate effort by Nordic researchers and experts who work on different aspects important for society´s resilience to natural hazards. The consortium spans the chain from academics to end-users, and includes i.a. experts on geophysics, meteorology, geography, engineering, societal infrastructure, the welfare systems, disaster law and (catastrophe) insurance, public health, psychological trauma, civil protection and emergency management. Thus, NORDRESS in itself is a network of scientists, experts, end-users and other stakeholders in the field of natural hazards and societal security. The contact net of the NORDRESS participants is wide and varied, so through its own internal work and meetings, NORDRESS already reaches a wide array of stakeholders.
NORDRESS publishes its findings in academic journals, books and reports. It helps members cover the publication cost in open access journals. It reaches out to other stakeholders through meetings, conferences and other media. The NSSA gives opportunities to bring together different groups, such as administrators, rescue workers, (local) politicians, inhabitants in risk areas, health professionals, media people and so forth. Thus NORDRESS has built in mechanisms that allow for a wide outreach to various stakeholders, on a local, national and international level.

### Impact strategies and plans:

In addition to conventional scientific means of disseminating results in high impact journals, books and conferences, NORDRESS emphasizes collaboration with stakeholders in all its WPs, as its impact will depend on the attention it gains among the public and decision makers. In particular we try to involve, or at least consult, authorities from relevant sectors in each project. Similarly, we reach out to those affected by the natural hazards, the local populations, rescue and relief teams, media etc. Thus we hope to ensure that our studies are perceived as relevant by those who work in the field, as well as those directly affected by the natural hazards.
The NSSA is a unique feature of NORDRESS. It provides wide opportunities for arranging workshops, courses or other events for a wide variety of stakeholders: scientists, administrators, civil protection agencies, rescue workers, and media people. It has proven invaluable for integrating the various elements of the CoE.

### Potential media stories:

A case in point here could be our studies on the resilience of individuals to natural disasters. These highlight the need for health care services to provide long-term assistance to disaster stricken communities.

Our results show that disasters can have long-standing effects on health. For instance, in a 3-year prospective follow-up of children exposed to the 2010 Eyjafjallajökull volcanic eruption, we found a chronicity of physical and mental health problems, such as respiratory symptoms and anxiety. Furthermore, in a follow-up of avalanche survivors we found sleep disturbances, stress-related physical symptoms and PTSD symptomology to be persistent 16-years post-disaster. Our studies indicate that the long-term sequelae of PTSD symptoms may be prevented by strengthening survivor's support systems, and for children, focusing on alleviating the caregiver's distress symptoms seems essential.

**Supplementary funding:**

We have not considered applying for additional funding to cover the needs mentioned here (user engagement, impact, communication activities, capacity building or inter-project liaison activities), as they are currently well covered by the NSSA. We have however applied for and secured additional funding for the research activities, in particular through national research funds. An important contribution lies in the numerous projects, national and international, that NORDRESS is linked to, such as App4Sea, CLIPS, ENHANCE, ClimRes, REALTIDSVARSLING, INTACT, ELASTINEN, Natural Disasters and Long-term Health Outcomes, and others.

**Program evaluation**:

We have no special comments on the work and procedures of NordForsk, the Program Committee or the Scientific Advisory Board, which have provided us with very useful advice and encouragement.

**Requests for Program support:**

NORDRESS is a large CoE with 13 WPs and more than 60 partners, who are prepared to assist each other. Thus we have not needed to seek advice directly to the NordForsk Program Committee. The Scientific Advisory Board provided very useful advice in both our meetings in June 2016 and 2017.
Again we thank NordForsk for offering support. So far the need has not arisen, but it is good to know that we may seek advice or assistance in the future.

**Table 1: Personnel of the NCoE**

*List the names of the research team leaders involved in the NCoE. Please give the number of other researchers and students who have worked within the project.* Also, please indicate the number persons in each category as listed (number of, number of man months in total and the number of man months paid by the NCoE).

| Name of the research team leader | Host Institution |
|---|---|
| Guðrún Pétursdóttir, WP1- WP2 | UI |
| Arna Hauksdóttir, WP3.1 | UI |
| Atle Dyregrov WP 3.1 | SFK |
| Ask Elklit WP3.3 | SDU |
| Haakon Lein WP4.1 | NTNU |
| Guðrún Gísladóttir WP4.2 | UI |
| Hans Jørgen Henriksen WP4.3 | GEUS |
| Per Danielsson WP 5.3 | SGI |
| Farrokh Nadim WP5.1 & 5.2 | NGI |
| Morten Thanning Vendelø WP5.4 | CBS |
| Guðmundur Freyr Úlfarsson WP 5.5 | UI |
| Adriaan Perrels WP 6.1 | FMI |
| Guðný Björk Eydal WP 6.2 | UI |

| | Number of Persons | Manmonths in Total | Manmonths paid by the NCoE |
|---|---|---|---|
| Professors and associate professors | 20 | 13,24 | 0,83 |
| Senior researchers (other than above) | 38 | 22,6 | 6,56 |
| Postdoctoral researchers | 5 | 26,5 | 26,5 |
| Postgraduate students | 7 | 22,56 | 4,16 |
| Other academic personnel | 0 | 0 | 0 |
| Auxiliary personnel (office, technical, other personnel) | 3 | 12,68 | 12,68 |

**Table 2: Researcher mobility**

*Please specify research stay abroad as well as visits by foreign researchers. Here mobility is defined as a stay abroad of at least 2 weeks duration.*

| Name, job title, organisation | Site of work | Purpose of visit | Duration of visit | Comments, output of the visit |
|---|---|---|---|---|
| I. Atte Harjanne, Doctoral student, Finnish Meteorological Institute Hans Jørgen Henriksen, Senior advisor and WP leader, GEUS | St. Paul, Mississippi, America | CSA2017 Conference participation and presentation. Academic/stakeholder conference. | 16-21.05. 5 days | The presentation raised a lot of interest and questions from the audience. I found multiple interesting projects and platforms that can be useful benchmarks and support as the WP4.3 work continues. Now writing a white paper on the current situation and trends within citizen science and lessons learned for the perspective of NORDRESS. |
| II. Deanne K. Bird, Research Analyst, Mac Quarie University, Sidney Australia and University of Iceland & lisa Gísladóttir, professor and Wp leader, University of Iceland | South Iceland | Interviews with experts and official's in Iceland in relation to Bárðarbunga volcanic eruption | 8 days in 2018 | Granted in 2017. Planned to be used in 2018 |
| III. Edda Björk Þórðardóttir, Posdoctoral researcher, University of Iceland. | Karolinska institution | Work with NORDRESS partner professor Christina Hultman and assistant professor Fang Fang. | 5-11 February 2017= 7 days | Worked with registry data on tsunami survivors. Independent analyses for children and adult tsunami survivors |

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| IV. Hans Jørgen Henriksen, senior advisor & WP leader | Dordrecht, Netherland | Participants from NORDRESS WP4.3, WP4.2 andWP5.3 took part in the multinational EDUCEN final conference in Dordrecht., NL | 29-31 March, 2017= 3 days | The EDUCEN project works with the idea that cultures, the 'soft infrastructure', hold important assets to disaster-affected communities; disaster managers and disaster-affected people. |
| V. Harpa Grímsdóttir, Coordinator for landslide and avalanche monitoring and three other avalanche- and landslide specialists from the Icelandic MetOffice (IMO) | Oslo & Åndalsnes | Meeting with Norwegian Road authorities on monitoring systems for avalanches, landslides and slush flows. | Nov 2017 9 days | November 1-2. Workshop on slushflows at NVE in Oslo, including presentations from NVE and NGI (Norway), IMO (Iceland) and Asiaq (Greenland), and discussion on slushflows: danger signs, warning systems, classification and more.<br>November 3-5. Skredkonferansen in Åndalsnes. Participation and presentations. November 6. Visit to the road authorities in Molde. |
| VI. Ingibjörg Lilja Ómarsdóttir, PhD student, University of Icealand & Guðrún Gísladóttir, professor and WP leader, University of Iceland | South Iceland | Study visits to hazard prone municipalities to explore how local service providers (social services, primary health care, local priest and voluntary agencies) prepare themselves for a natural disaster, organize and carry out their response and recovery operations. | Two weeks in 2017= 14 days | Valuable information gathered and is being analyzed. |
| VII Karoliina Pilli-Sihvola, Resercher, FMI & Adriaan Perrels, WP leader, FMI | Copenhagen Center for Disaster Research, COPE. | Study visit & NEEDS2 Conference Copenhagen | 27.04-03.06. 2017 = 37 days | Most of the work was related to finalising Karoliina´s PhD thesis, which is based on research done in NORDRESS. She also prepared a presentation for the NEEDS2 |
| VIII. Lisa Van Well, (WP 4.2 & 5.3) | ECCA 2017 in Glasgow, | Conducting a special NORDRESS session at ECCA 2017 | 5-9 june = 5 days | The presentations highlighted different, but interrelated aspects of local knowledge in |

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| Senior Researcher. Swedish Geotechnical Institute (SGI) | UK | "Constituting Local Knowledge of Natural Disasters in Climate Adaptation" WP 4.2 organized the session, but WPs 4.1 and 4.3 also gave presentations there. | | disaster risk management from the Nordic countries, as well as Australia. |
| IX. Rasmus Dahlberg, Post doc., University of Copenhagen, Faculty of Law. | Sevilla, Spain | Presentation at the 5th Int. Conference on Disaster Management and Human Health. | 7-9 June =3 days | Rasmus Dahlberg presented a paper from WP 5.4 "Making Sense of Signals" based on field work in Greenland during the LIVEX16 exercise in 2016, |
| X. Sóley Kaldal, Project officer, Icelandic Coast Guard | Copen-hagen, Denmar k | Participation in a NEEDS2, with academics and practitioners engaged in Maritime Emergency Management in the Arctic. | 16-20 May =4 days | Attendance, presentation and panel discussions at NEEDS2 conference. Cooperation with the Danish Air Force on development of air-droppable rescue pallets. |
| XI. Reija Ruuhela, Climate expert, meteorologist, FMI | Glasgow, UK | Participation on 3rd European Climate Change Adaptation Conference, ECCA 2017 | 5-9 June= 5 days | Reija gave an oral presentation and established contacts with international scientists in the fields relevant to her work, e.g. urban planning, urban heat island and health impacts. |
| XII. Berglind Guðmundsdótti r, Chief psychologist, Landspitali, University hospital | Odense, Denmar k | XVth international conference of the European Society of Traumatic Stress Studies. Meeting with other NORDRESS partners. | 2-4 June =3 days | Valuable exchange if ideas with international experts in her field.<br>Presented a paper on NORDRESS funded research. |
| XIII. Edda Björk Þórðardóttir, Postdoctoral researcher, University of Iceland. | Stockhol m and Odense | To work with NORDRESS partners at Karolinska.<br>Then taking part in the XVth international conference of the European Society of Traumatic Stress Studies. | 22-26 May = 5 days.<br>2-4 June = 3 days<br>Total of 8 days | Edda worked with NORDRESS collaborators and postdoc Huan Song, on data analyses for her post-doctoral project funded by NORDRESS |

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| XIV. Arna Hauksdóttir, professor, University of Iceland. WP leader. | Odense | XVth international conference of the European Society of Traumatic Stress Studies. Meeting with other NORDRESS partners. | 2-4 June =3 days | Presented results from NORDRESS-funded studies. |
| XV. Uta Reichardt, PhD candidate, University of Iceland. Guðmundur Freyr Úlfarsson, professor & Wp leader, University of Iceland | Washington DC, USA | Transportation Research Board 97th Annual Meeting, Poster presentation and workshop participation | January 7-11 2018 = 5 days | Research dissemination and network enhancement |
| XVI. Karoliina Pilli-Sihvola, Researcher, Finnish Meteorological Institute. Adriaan Perrels,Wp leader, Finnish Meterological Institute | Copenhagen, COPE | Study visit to Copenhagen Center for Disaster Research, University of Copenhagen. | 3 week period in 2018 = 21 days | Granted in 2017 plan to be used in 2018. |
| XVII. Atle Dyregrov, Professor, Center for Crisis Psychology, Department of Psychology, Norway | Longyerbyen Svalbard | Visit to Longyerbyen Community Council, fire and preparedness services, schools and persons with responsibility for psychosocial interventions. Communicating with children and adolescents about natural disasters. | 4.-6. February 2018 = 3 days | (Granted in 2017, used in February 2018)<br>Two focus group interviews. Meeting with several of the teachers at the school who had experienced the avalanche in 2015.<br>Both these meetings gave me a further understanding of the challenges Longyearbyen is facing, and also how they cope with the recent disastrous events and the risk of new avalanches. |
| XVIII. Peter van der Keur, Senior | Dordrecht, | Participants from NORDRESS WP4.3, | 29-31 March, | The EDUCEN project works with the idea that cultures, the |

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| researcher, GEUS (Wp 4.3 & 6.1) | Netherla nd | WP4.2 andWP5.3 took part in the multinational EDUCEN final conference in Dordrecht., NL | 2017= 3 days | 'soft infrastructure', hold important assets to disaster-affected communities; disaster managers and disaster-affected people. |
| XIX. Lisa van Well, Researcher, SGI. (WP 4.2 & 5.3) | Dordrec ht, Netherla nd | Participants from NORDRESS WP4.3, WP4.2 andWP5.3 took part in the multinational EDUCEN final conference in Dordrecht., NL | 29-31 March, 2017= 3 days | The EDUCEN project works with the idea that cultures, the 'soft infrastructure', hold important assets to disaster-affected communities; disaster managers and disaster-affected people. |
| XX. Guðrún Gísladóttir, professor & WP leader, University of Iceland (WP 4.2) | Dordrec ht, Netherla nd | Participants from NORDRESS WP4.3, WP4.2 andWP5.3 took part in the multinational EDUCEN final conference in Dordrecht., NL | 29-31 March, 2017= 3 days | The EDUCEN project works with the idea that cultures, the 'soft infrastructure', hold important assets to disaster-affected communities; disaster managers and disaster-affected people. |
| XX1 Guðrún Jóhannesdóttir, Project manager, (WP 4.1, 4.2 & 6.1), ICEPEM | Dordrec ht, Netherla nd | Participants from NORDRESS WP4.3, WP4.2 andWP5.3 took part in the multinational EDUCEN final conference in Dordrecht., NL | 29-31 March, 2017= 3 days | The EDUCEN project works with the idea that cultures, the 'soft infrastructure', hold important assets to disaster-affected communities; disaster managers and disaster-affected people. |
| XXII. Deanne Bird, Post. Doc. (WP 4.2) University of Iceland. | ECCA 2017 in Glasgow, UK | Conducting a special NORDRESS session at ECCA 2017 "Constituting Local Knowledge of Natural Disasters in Climate Adaptation" WP 4.2 organized the session, but WPs 4.1 and 4.3 also gave presentations there. | 5-9 June = 5 days | The presentations highlighted different, but interrelated aspects of local knowledge in disaster risk management from the Nordic countries, as well as Australia. |
| XXIII. Guðrún Jóhannesdóttir, Project manager, ICPEM. | ECCA 2017 in Glasgow, UK | Conducting a special NORDRESS session at ECCA 2017 "Constituting Local Knowledge of Natural Disasters in Climate | 5-9 June = 5 days | The presentations highlighted different, but interrelated aspects of local knowledge in disaster risk management from the Nordic countries, as well as Australia. |

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| | | Adaptation"<br>WP 4.2 organized the session, but WPs 4.1 and 4.3 also gave presentations there. | | |
| XXIV. Guðrún Gísladóttir, professor and WP leader, University of Iceland | ECCA 2017 in Glasgow, UK | Conducting a special NORDRESS session at ECCA 2017<br>"Constituting Local Knowledge of Natural Disasters in Climate Adaptation"<br>WP 4.2 organized the session, but WPs 4.1 and 4.3 also gave presentations there. | 5-9 June = 5 days | The presentations highlighted different, but interrelated aspects of local knowledge in disaster risk management from the Nordic countries, as well as Australia. |
| XXV. Charlotte Cederbom, group leader, SGI | ECCA 2017 in Glasgow, UK | Conducting a special NORDRESS session at ECCA 2017<br>"Constituting Local Knowledge of Natural Disasters in Climate Adaptation"<br>WP 4.2 organized the session, but WPs 4.1 and 4.3 also gave presentations there. | 5-9 June = 5 days | The presentations highlighted different, but interrelated aspects of local knowledge in disaster risk management from the Nordic countries, as well as Australia. |
| XXVI. Haakon Lein, professor & Wp leader. NTNU | ECCA 2017 in Glasgow, UK | Conducting a special NORDRESS session at ECCA 2017<br>"Constituting Local Knowledge of Natural Disasters in Climate Adaptation"<br>WP 4.2 organized the session, but WPs 4.1 and 4.3 also gave presentations there. | 5-9 June = 5 days | The presentations highlighted different, but interrelated aspects of local knowledge in disaster risk management from the Nordic countries, as well as Australia. |
| XXVII. Peter van der Keur, Senior Researcher. GEUS | ECCA 2017 in Glasgow, UK | Conducting a special NORDRESS session at ECCA 2017<br>"Constituting Local Knowledge of Natural Disasters in Climate Adaptation"<br>WP 4.2 organized the session, but WPs 4.1 | 5-9 June = 5 days | The presentations highlighted different, but interrelated aspects of local knowledge in disaster risk management from the Nordic countries, as well as Australia. |

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| | | and 4.3 also gave presentations there. | | |
| XXVII. Hans Jørgen Henriksen, Senior Advisor & Wp leader. GEUS | ECCA 2017 in Glasgow, UK | Conducting a special NORDRESS session at ECCA 2017 "Constituting Local Knowledge of Natural Disasters in Climate Adaptation" WP 4.2 organized the session, but WPs 4.1 and 4.3 also gave presentations there. | 5-9 June = 5 days | The presentations highlighted different, but interrelated aspects of local knowledge in disaster risk management from the Nordic countries, as well as Australia. |

**Open access Publication grant:**

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| I. Athanasios Votsis (FMI) | | Open access publication fee | Environment and Urban Systems, VOL. 64, (2017), pp. 344-355 | Utilizing a cellular automation model to explore the influence of coastal flood adaptation strategies on Helsinki's urbanization patterns |
| II. Sigríður Sif Gylfadóttir (IMO) | | Open access publication fee | Journal of Geophysical Research: Oceans 122(5), 4110-4122. | The 2014 Lake Askja rockslide-induced tsunami: Optimization of numerical tsunami model using observed data. doi:10.1002/2016JC012496 |

| Number of: | |
|---|---|
| Visiting months | 6,3 |
| Visiting researchers | 27 |

### Table 3: Researcher training and education

*Please list courses organized. Specify the number of students participating (own students, and other students) and number of ECTS points gained in the courses. In addition, the number of PhD and Post Docs, both national and international is asked for.*

| Course (name of course, institution, person responsible) | Own Students | Other students | Number of ECTS points |
|---|---|---|---|
| PHd Summer Course: Disaster social work: Resilience and crisis management in the context of welfare states.<br>University of Iceland, Guðný Björk Eydal | 4 | 12 | 4 |
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**How many PhDs and Post Docs are recruited in Nordic countries (specify the country) and how many are recruited internationally?**

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| Number of PhD students recruited in Nordic countries (specify the country) | 3 Iceland<br>1 Norway<br>3 Finland<br>1 Denmark | |
| Number of PhD students recruited outside Nordic countries | 1 Germany | |
| Number of Post Docs recruited in Nordic countries (specify the country) | 1 Iceland<br>2 Norway<br>1 Denmark | |
| Number of Post Docs recruited outside Nordic countries | 1 Australia | |

**Specify the number of PhD degrees achieved at the NCoE in reporting period.**

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| Number of PhD degree achieved | 3 |

**Table 4: Output and dissemination**

*Report the output of the research, e.g. publications.*

***Two tables are provided**. The first table is for publications, reports and outreach activities with the main activities/collaboration funded by the NCoE. The second table is for publications, reports and outreach activities where the NCoE research has contributed. Also, report the number of Open Access publications.Please attach a complete publication list – To the extent possible, please indicate direct publication linked to the work of the NCoE.*

## University degrees completed in 2016:

**PhD thesis:**

1. Rasmus Dahlberg (WP 5.4)
2. Athanasios Votsis (WP 6.1)
3. Merja Rapeli (WP6.2)

**MSc theses:**

1. Jasmine Anastasia Hayes. Vulnerability to jökulhlaup hazards: A case study of the Þjórsá floodplain, Southern Iceland. Graduation June 2017

**Outreach and Dissemination main activities/collaboration funded by the NCoE**

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| Peer reviewed scientific publications / of which Open Access | 1. Reichardt, U., G. F. Ulfarsson and G. Petursdottir, 2017. Cooperation between Science and Aviation Sector Service Providers in Europe for the Risk Management of Volcanic Ash. Transportation Research Record: Journal of the Transportation Research Board, No. 2626, pp. 99-105.<br><br>2. Dahlberg, R. (2017) Who is the center? *A case study of social network in an emergency management organization*. International Journal of Emergency Services, vol.6, no. 1, pp 52-66 |
| Non peer-reviewed publications / of which Open Access | [Type text] |
| Reports | [Type text] |

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| Publications for the public | [Type text] |
| Invited conference presentations | Magnus Tumi Gudmundsson: Volcanic hazards in Iceland, past, present and prospects for the future IDRiM2017 August 23-25-2017<br><br>Atle Dyregrov and Gunhild Setten How can we prepare ourselves for disasters? IDRiM2017 August 23-25-2017<br><br>Guðmundur Freyr Úlfarsson Cascading Impacts of Natural Hazards IDRiM2017 August 23-25-2017<br><br>Henriksen HJ. Adaptive modelling and participatory early warning and monitoring systems. TopSoil Workshop on groundwater flooding. Haraldskær, Denmark 28-29 November 2017 |
| Conference presentations, oral / poster | Andresen, S A: In the heat of the moment: a local narrative of the responses to a fire in Lærdal, Norway. NEEDS 2 Conference, Copenhagen May 17th – May 19th 2017<br>Andresen, S A: Speed presentation: The Political Ecology of Disasters: a case study of the fire in Lærdal, Norway. NTNU, SU-Fakultetets Oppstartskonferanse. March 16th 2017<br><br>Andresen, S A: In the heat of the moment: a local narrative of the responses to a fire in Lærdal, Norway. NEEDS 2 Conference, Copenhagen May 17th – May 19th 2017<br><br>Arna Hauksdóttir et al Health effects of the Eyjafjallajökull volcanic eruption among children: a prospective cohort study in 2010 and 2013. 15th Conference of European Society for Traumatic Stress Studies, organized by The National Centre for Psychotraumatology in Denmark and the University of Southern Denmark. 2-4 June 2017.<br><br>Arna Hauksdóttir Health related outcomes of disasters. NORDRESS - Nordic Centre of Excellence on Resilience and Societal Security. Annual meeting, Reykjavík 21-22 August 2017.<br><br>Arna Hauksdóttir, Harpa Þorsteinsdóttir, Urður Njarðvík, Edda Björk Thórdardóttir, Guðrún Pétursdóttir. Health effects of the Eyjafjallajökull volcanic eruption among children: A prospective cohort study in 2010 and 2013. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Arna Hauksdóttir; Ólöf Sunna Gissurardóttir; Edda Björk Thórdardóttir; Heiðrún Hlöðversdóttir, Guðrún Pétursdóttir. Iceland Mental health effects following the eruption in Eyjafjallajökull volcano in Iceland- A population based study. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Atte Harjanne. Karoliina Pilli-Sihvola, Riina Haavisto. A country without |

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| | disasters? Managing disaster and climate risks in a Nordic welfare state. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Bjorn Karlsson. The development of a methodology for risk and capability assessments within the Baltic Sea Region. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Deanne Bird. Tourism survival? The balance of money and risk. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Edda Bjork Thordardottir; Berglind Gudmundsdottir, Gudrun Petursdottir; Unnur Anna Valdimarsdottir,; Arna Hauksdottir. Psychosocial Support After Natural Disasters in Iceland Implementation and Utilization.8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Edda Bjork Thordardottir; Unnur Anna Valdimarsdottir; Berglind Gudmundsdottir, Arna Hauksdottir, Sleep disturbances in adulthood among childhood avalanche survivors: Risk and resilience factors. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Guðrún Gísladóttir, Deanne Bird. Coping with and recovering from disasters: the 2010 Eyjafjallajökull experience. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Hans Jørgen Henriksen Using citizens' observations and information sharing in flood risk management in Session:Constituting local knowledge of natural disasters in climate adaptation. ECCA Glasgow 2017<br>Hans Jørgen Henriksen, Jacob B Kidmose, Peter Van der Keur. Building trust in water governance through intelligent water infrastructure. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Heidrun Hlodversdottir; Gudrun Petursdottir; Hanne Krage Carlsen,; Thorarinn Gislason; Arna Hauksdóttir. Long-term health effects of the Eyjafjallajökull volcanic eruption: A prospective cohort study in 2010 and 2013. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Karoliina Pilli Sihvola, Challenges in estimating health and economic impacts of disasters. 8th Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Lisa van Well **organized** a Session at the ECCA 2017 confer4ence in Glasgow: "Constituting Local Knowledge of Natural Disasters in Climate Adaptation":<br><br>Per Danielsson, Öberg Mats, Hedfors Jim, Ndayikengurukiye Godefroid: Coastal vulnerability index for erosion. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017. |

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| | Ragnheiður Hergeirsdóttir, Guðný B. Eydal. Árborg 2008: Local social services responding to earthquake and financial crisis. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Rasmus Dahlberg, Morten Thanning Vendelø. Making sense of signals. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Rasmus Dahlberg: The turn towards resilience in Danish emergency management. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Reichardt, Gudmundur F. Ulfarsson, Gudrun Petursdottir. Ash clouds over Europe: Volcanic ash scenarios and potential impacts on air traffic. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Uta Reichardt, Guðmundur F. Ulfarsson, Guðrún Pétursdóttir. Enhancing Resilience of Air Traffic due to Extreme Volcanic Ash Scenarios: Policy Recommendations for Aviation. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Reichardt, U., G. F. Ulfarsson, and G. Pétursdóttir, 2017. Cooperation between science and aviation sector service providers in Europe for the risk management of volcanic ash. The 96th Annual Meeting of the Transportation Research Board, Compendium of Papers, Transportation Research Board, National Research Council, Washington, District of Columbia, U.S.A., 15 p.<br><br>Reichardt, U., G. F. Ulfarsson, and G. Pétursdóttir, 2017. Policy recommendations for enhanced resilience of aviation due to extreme volcanic ash eruptions. The 96th Annual Meeting of the Transportation Research Board, Compendium of Papers, Transportation Research Board, National Research Council, Washington, District of Columbia, U.S.A., 17 p.<br><br>Reichardt, U., G. F. Ulfarsson, and G. Pétursdóttir, Volcanic Ash and Aviation in Europe: Exploration of extreme scenarios with stakeholders. Korea Research Institute for Human Settlements, Sejong City, Republic of Korea, June 2, 2017<br>.<br>Reichardt, U., G. Pétursdóttir, and G. F. Ulfarsson, 2017: Ash and Aviation in Europe: Preparedness Analysis through scenario narratives. DPRI Research Seminar, Kyoto University, Kyoto, Japan, May 30.<br><br>Reichardt, U., G. Pétursdóttir, and G. F. Ulfarsson, 2017: The vulnerability of air traffic to volcanic eruptions. NORDRESS Annual Meeting, Reykjavik, Iceland, August 22.<br><br>Setten G & Lein H: The temporality and spatiality of 'local' knowledge and its relevance for climate change adaptation and natural hazard management – ECCA Glasgow 2017<br><br>Sigrún Karlsdóttir, Emmanuel P. Pagneux, Sara Barsotti, Melissa Anne Pfeffer, |

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| | Davíð Egilson, Sigríður Sif Gylfadóttir, Halldór Björnsson. Risk assessment of natural hazards in Iceland – an overview. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Silje Aurora Andresen: The political ecology of disasters – a case study of the fire in Lærdal, Norway. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017. Poster<br><br>Silje Aurora Andressen. You need to be where the fire happens´: the construction of the 'local' in Norwegian newspapers after the fire in Lærdal, Norway. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Þórhildur Heimisdóttir: The attraction of active volcanoes in tourism. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Þorsteinn Sæmundsson. Possible consequences of mass movements on outlet glaciers and into proglacial lakes in Iceland. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Gudrun Gisladottir. 29-31 March 2017 *NORDRESS presentation*. EDUCEN conference Dordrecht NL. March 2017<br><br>Henriksen HJ, Kidmose J and van der Keur P. Using citizens' observations and information sharing in flood risk management. ECCA conference Glasgow 4-6 June 2017.<br><br>Harjanne A. and Tuomenvirta H. FMI. Weather, Climate and Citizens: What Can a Meteorological Institute Get from Citizen Science? Session E7 Transforming institutions and models with citizens science.<br>Citizen Science Association Conference in St.Paul, U.S., May 17-20 2017<br><br>Henriksen, HJ. Participatory early warning and monitoring system (Nordress task 4.3).NordForsk Societal Security meeting in Copenhagen 19 July 2017<br><br>Uta Reichardt: Risk management of volcanic ash in Europe: Cooperation between science and aviation sector service providers. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017. **Poster**<br><br>Edda Björk Þórðardóttir: Sleep disorders and sleep medication use among Swedish survivors of the 2004 Southeast Asia tsunami 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017. **Poster**<br><br>Edda Bjork Thordardottir; Berglind Gudmundsdottir, Gudrun Petursdottir; Unnur Anna Valdimarsdottir,; Arna Hauksdottir. Psychosocial Support After Natural Disasters in Iceland - Implementation and Utilization. 15th Conference of European Society for Traumatic Stress Studies, organized by The National Centre for Psychotraumatology in Denmark and the University |

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| | of Southern Denmark. 2-4 June 2017. **Poster** |
| Number of appearances in media | Several NORDRESS participants were interviewed on national TV in relation to the IDRiM2017 conference.<br>[Type text] |
| Outreach and dissemination to the public | Participation in EDUCEN conference March 28-30, 2017 (GEUS Mobility Grant) and discussion with the EDUCEN network<br><br>Hans Jørgen Henriksen has participated in expert group giving recommendations for risk assessment for rivers (co-funded): http://mfvm.dk/fileadmin/user_upload/MFVM/Ekspertudvalget_rapport.pdf<br><br>Aleksi Räsänen: Levels and roles of community in flood resilience – reflections from Finnish Laplan. NTNU Department of Geography – Research Seminars Monday, 30 October 2017<br><br>IMO news about flooding in SE Iceland in September 2017. This was the first test-use of the public registration page, https://vatnsflod.vedur.is/<br><br>Reichardt, U., G. Pétursdóttir, and G. F. Ulfarsson, 2017: Volcanic ashes and working characters – comparing practises between Japan and Iceland. DPRI Research Seminar, Kyoto University, Kyoto, Japan, July 18 2017. |
| Web disseminations | [Type text] |
| Conferences arranged | 8th Integrated Disaster Risk Management Conference August 23-25 2017<br><br>Lisa van Well: Session on "Constituting Local Knowledge of Natural Disasters in Climate Adaptation" planned and accepted to the ECCA 2017 conference (with WP 4.2)<br><br>Uta Reichardt: Seminar on stakeholder workshops, DPRI, Kyoto University, Kyoto, Japan, July 18, 2017. |
| Summer courses | PhD Summer course in Disaster Social Work: Resilience and Crisis management in the Context of Welfare States. May 23-27 2017 in Skálholt, Iceland |

**Outreach and Dissemination where the NCoE has contributed**

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| Peer reviewed Publications / of which Open Access | Athanasios Votsis (2017) Utilizing a cellular automaton model to explore the influence of coastal flood adaptation strategies on Helsinki's urbanization patterns' Computers, Environment and Urban Systems, Vol. 64, pp. 344–355 (open access)<br><br>Rapeli M, Cuadra C,Dahlberg R, Eydal GB, Hvinden B, Ómarsdottir IL, Salonen T: Local social services in disaster management: is there a Nordic model? Int J Disaster Risk Reduction,27:618-624,2017 http://stjornarradid.is/lisalib/getfile.aspx?itemid=1cf93c9d-e594-11e7-9423- |

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| | 005056bc530c<br><br>Eydal GB and Ómarsdóttir IL: Velferð og vá, Hlutverk félagsþjónustu sveitarfélaga í almannavarnaskipulagi á Norðurlöndum. Tímarit félagsráðgjafa,1,11:18-21, 2017 http://dx.doi.org/10.1016/j.ijdrr.2017.07.018+<br><br>Sigríður Sif Gylfadóttir, Jihwan Kim, Jón Kristinn Helgason, Sveinn Brynjólfsson, Ármann Höskuldsson, Tómas Jóhannesson, Carl Bonnevie Harbitz, Finn Lovholt<br>The 2014 Lake Askja rockslide-induced tsunami: Optimization of numerical tsunami model using observed data.<br>Journal of Geophysical Research: Oceans 122(5), 4110-4122. (2017). doi:10.1002/2016JC012496 |
| Non peer-reviewed Publications / of which Open Access | Høegh H, Larsen T, Kronvang B, Friberg N, Jacobsen TV, Henriksen HJ, Anker HT,Kragh P, Sørensen HV, Jensen NP,Sønderup F, Laursen SW. Rapport fra ekspertudvalget til ændret vandløbsforvaltning. Miljø- og fødevareministeriet. December 2017. |
| Reports | Eydal,GB; Dahlberg,R;Ómarsdóttir,IL; Cuadra,C; Hvinden,B; Rapeli,M; Salonen, T: Known and unknown risks-future challenges for local social services. Nordic Council of Ministers, Copenhagen, 2017<br><br>Report on return periods of flooding published in early 2017. Öfgagreining á flóðhæðum í Reykjavík og á Patreksfirði:Prófun á þröskuldsaðferð og samlíkum (http://www.vedur.is/media/vedurstofan-utgafa-2017/VI_2017_003.pdf)<br><br>Nadim,F et al: Mitigation of risk posed by slope failures on transport infrastructure – Gaps and needs, NGI Report 2017<br><br>Peter van der Keur, Lisa Staugaard,Anne Mette Meyer, Tim McInerny, Molnár András, Hans Jakob Hausmann,Susanne Berendt, Atte Harjanne and Hans Jørgen Henriksen: Sharing good practice and multiagency partnership framework, CRUA report. EU-ECHO funded. GEUS, Danish Red Cross. Hungarian Red Cross. FMI. 2017 |
| Publications for the public | |
| Invited conference presentations | Atle Dyregrov Mental health interventions for children after disasters. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Atle Dyregrov, Center for Crisis Psychology Norway; Kari Dyregrov, Western Norway University of Applied Science Norway. Family gatherings for bereaved after disasters. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017. |

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| Conference presentations, oral / poster | Aleksi Räsänen, Sirkku Juhola, Vera Kauppinen, Haakon Lein. The role of networks and levels in community flood resilience. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Aleksi Räsänen: Levels and roles of community in flood resilience – reflections from Finnish Lapland. NTNU Department of Geography – Research Seminars Monday, 30 October 2017<br><br>Amy Oen ,Kalsnes Bjørn ,Nadim Farrokh ,Unni Eidsvig. Nature-based solutions: ecological, social and economic resilience for society. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Antonelli, E., Frigotto, M.L., & Vendelo, M.T. (2017). Organizational learning from exercises and experiments _ Preparing for accidents and disasters. Paper presented at 2nd Northern European Conference on Emergency and Disaster Studies (NEED2) Copenhagen, May 17-19, 2017.<br><br>Christian Jaedicke, Erik Hestnes: Snow avalanche events in Longyearbyen and what lessons they hold for avalanche risk management. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Emmanuel Pagneux ,Guðrún Elín Jóhannsdóttir ,Tinna Þórarinsdóttir ,Hilmar Björn Hróðmarsson , Davíð Egilson. 100 years of flooding events in five Icelandic catchments: causes, seasonality and impacts. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Emmanuel Raju. CCA and DRR: Integration or Divergence? Findings from Denmark. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Guðný Björk Eydal, Ingibjörg Lilja Ómarsdóttir, Carin Cuadra,Rasmus Dahlberg, Björn Hvinden, Merja Rapeli, Tapio Salonen. Local Social Services in Nordic Countries in Times of Disaster. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017<br><br>Gunhild Setten Of men and materialities. A gendered reading of news media coverage of a wildfire in Norway in 2014. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Marco Uzielli, Guido Rianna, Paola Mercogliano, Fabio Ciervo, Unni Eidsvig. Temporal evolution of landslide risk for the municipality of Nocera Inferiore, Italy under the effect of climate changes. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Reija Ruuhela, Ari-Juhani Punkka, Sari Hartonen, Sanna Luhtala, Stefan Fronzek, Timothy Carter. Experiences on weather warnings related to direct |

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| | health impacts. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Roberts MJ. Design and use of Online Geo-Forms for Public Observations of Natural Hazards in Iceland. GI Norden and LÍSA conference Reykjavík 12 October 2017.<br><br>Sóley Kaldal. Preparing for zero frequency events. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Suzanne Lacasse, Farrokh Nadim: Hazard and risk management for natural threats – An engineer's viewpoint. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Tóra Petersen School based intervention following disasters. 8th International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, August 23-25 2017.<br><br>Van Well and Zetterlund:The needs-knowledge gap and geotechnical risk in Swedish local and regional planning ECCA Glasgow 2017 **Poster** |
| Number of appearances in media | [Type text] |
| Outreach and dissemination to the public | Cold Disaster: Risk and resilience in the Artic, public speech by Rasmus Dahlberg, August 21, 2017. |
| Web disseminations | Coastal Vulnerability Index for erosion was launched in February 2017. |
| Conferences arranged | |
| Courses/Seminars arranged | A course: Crisis Management, has been developed for the Global Executive MBA program, Copenhagen Business School. In part the course drew on insights generated in NORDRESS, and it included presentations from Rasmus Dahlberg and Morten Thanning Vendelo. |

**Table 5: Meetings and networking**

| *Number of workshops with invited speakers, conferences and other academic events organised by the NCoE:* | |
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| Workshops | Workshop at the 3rd European Climate Change Adaptation Conference, August 5-9 2017 in Glasgow |
| Conferences | Close to 40 sessions at the 8th Integrated Disaster Risk Management Conference, August 23-25 2017 in Reykjavik<br>NORDRESS Annual meeting August 22 2017 |
| Other academic events | PhD Summer course in Disaster Social Work: Resilience and Crisis management in the Context of Welfare States. May 23-27 2017 in Skálholt, Iceland<br><br>Workshop on Sustainability and Social Capital, at the International Federation of Social Workers Conference. May 28-30 2017 in Reykjavik<br><br>A Course on Crisis Management developed for the Global Executive MBA program, Copenhagen Business School. In part the course draws on insights generated in NORDRESS, and includes presentations from Rasmus Dahlberg and Morten Thanning Vendelo. |
| **Total** | 6 |