

Annual reporting 2016: Nordic Centre of Excellence (NCoE) in the Nordic Societal Security Programme

Report Headings: (Bullet points)

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: (One paragraph)

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: (One paragraph, on practical changes affecting the grant holder(s), research staff or institution since the funding commenced.)

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.

WP5.1 (on landslides) and 5.2 (on avalanches) were merged, as it was deemed more efficient by their members, most of whom come from the same institutions.

Some serious extraneous changes have occurred, however, that are way beyond the organizers' control. The exchange rates of the Nordic currencies have changed dramatically from the time the NORDRESS application – including the budget - was written in 2014. Then the Norwegian krona was worth 23 Icelandic kronur, while the current exchange rate on March 20 2017 is 12,76. As a considerable proportion of the project's work is performed in Iceland, this unforeseen development dramatically reduce the number of man-months the funding can cover.

Personnel of the NCoE:

See table 1 below

Detailed research progress: (*Not exceeding four A4 pages*).

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). Following is a brief description of the progress made in 2016 in these WPs as well as of the work on Administration (WP1) and the Nordic Societal Security Academy (WP2). Following a résumé of the progress in each WP, we will discuss the issues mentioned above. 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 managed the entire CoE, distributed funds and followed the progress of all WPs, providing information and advice as needed. WP1 introduced NORDRESS in various fora, searched for cooperation opportunities outside of NORDRESS and prepared grant applications to national and international funds. WP1 arranged meetings, most notably the first annual meeting successfully held in Copenhagen on May 8 2016, and attended a meeting with the Scientific Advisory Board in Reykjavik on June 20-21 2016. Last but not least, preparing the yearly report is in the hands of WP1.

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. The NSSA calls for applications for mobility grants and courses twice a year, but is open to urgent applications at all times. In 2016 NSSA received 18 applications for mobility grants and 3 for courses. All but one application met the required standards and were funded. While many funded activities took place in 2016, others are planned for 2017. 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 report includes all three subtasks of WP3 as they work closely together):

Volcanic Eruptions: A follow up study on health effects (respiratory morbidity, sleep disturbances, perceived stress and PTSD among adults) of the Eyjafjallajökull eruption 2010, measured six months and three years post eruption.

We fulfilled our aim and published an open access paper in BMJ Open in fall 2016.

A paper on the **mental health** effects of the Eyjafjallajökull eruption was submitted to the Scandinavian Journal of Public Health late in 2016.

A study on the risk of physical and psychological symptoms (e.g. headache, sleep disturbances, anxiety) among **children** 6 months and 3 years post eruption is progressing well. The first findings were published in an MPH thesis defended in 2016. Comparative post-eruption studies on children's health continue.

We have applied for ethical approval and attained registry data for a study on respiratory morbidity, sleep disturbances, anxiety and depression (according to ICD-10 diagnoses and utilization of pharmaceuticals), during 5-years both pre- and post-eruption.

We aim to widen our collaboration to other scientists working with similar data sets in Iceland.

Snow Avalanches

16 years after fatal **avalanches** in the Icelandic Westfjords we study how survivors have fared by investigating known disaster-related disturbances such as sleep disorders among those who were children or adults at the time to the avalanches. NSSA supported a study trip to the area to establish direct contact with officials and residents in the affected communities. In addition to interviews, questionnaire data has been collected and analysis is underway. We plan to submit a paper to an international peer-reviewed journal in summer 2017. A Doctoral thesis was completed and defended in 2016.

Tsunami

A study of post trauma effects of the **2004 Tsunami** in South East Asia is underway. Currently we are analysing sleep disorder medication use during a 10-year follow-up among Swedish adult and childhood survivors (registry data). Ethical approval has been confirmed and data sets attained in collaboration with the Medical Epidemiology and Biostatistics Department (MEB) at Karolinska Institutet in Sweden. Data analysis is underway.

Intervention and Risk Reduction during and after Natural Disasters

The plan is to develop a web-based intervention tool for survivors of natural disasters and test it for logistics and feasibility. A literature review on psychosocial support following natural disasters has been published. Further, a special effort was made to get insight into the “non-published” knowledge base, by visiting institutions and interviewing scientists and practitioners in the Nordic countries, as well as in the USA and Israel. These are currently being analysed.

WP4 COMMUNITY RESILIENCE (including WP4.1 Unpacking and measuring community resilience; WP4.2 Risk perception; and WP4.3 Participatory early natural hazard warning and monitoring systems).

WP4 builds to a large extent on collaboration with end-users, such as inhabitants in hazard prone areas, rescue- and civil protection agents, technical innovators, scientists and other experts. WP4 has made significant progress in generating knowledge on (1) the resilience of individuals and communities to various natural hazards, (2) societal factors that affect people’s understanding of natural hazards and decision making during crises, as well as their perception of services provided by civil protection agents and other disaster response organisations, and (3) participatory early warning and monitoring systems.

The general outcome is that communities differ significantly in how they address and prepare for natural hazards. Thus, efforts to strengthen community resilience should be place-specific, focusing on community-led disaster risk reduction planning, recognising the importance of empowering local residents with knowledge, resources and techniques to reduce their own risks and develop strategies suited to local needs.

Together, scientists and end users have developed strategies to meet various risks, visualise exposure and vulnerability, develop adaptive measures for various sectors and social groups, and develop long term community recovery plans.

The studies published from WP4 in 2016 vary, including MSc theses on efficient means of communication during volcanic hazards in Iceland, and another on coastal community resilience in Denmark related to climate change adaptation and risk reduction. In Finland results were published on the relationship between weather conditions and humerus fractures in children. A book chapter on impacts of climate change on Northern communities was published in 2016, as well as a peer reviewed paper on forest fires in Norway in the Int.J.Disaster risk reduction. A WP4 member was among the editors of the Springer book Observing the Volcano World. Volcano Crisis Communication, to which a chapter on Crisis coordination and communication during the 2010 Eyjafjallajökull eruption was accepted for publication.

A webportal has been launched to engage the public in monitoring water levels and impending floods, thus improving warning through interactive and user friendly real time GIS-based webpages. Further, a stakeholder engaged design of a hydrological real-time system for surface water and groundwater monitoring in Denmark has been published. The next step is to use these new tools to develop further a Nordic natural hazard early warning and monitoring system.

WP 5 INFRASTRUCTURE RESILIENCE WP5 studies the resilience of transportation to natural hazards. There are tasks on slope failures and avalanches (5.1, 5.2), coastal flooding (5.3), arctic marine safety (5.4) and air traffic and volcanic ash (5.5).

Slope Failures In 2016 a report was prepared on *Mitigation of risk posed by slope failures on transport infrastructure – Gaps and needs*. The report was prepared by partners in Norway (NGI), Sweden (SGI) and Iceland (IMO). It identifies the gaps and research needs within the landslide risk management process, with regard to transportation infrastructure. The gaps and needs are identified through causal analysis of adverse events as well as analyses of implementations in the aftermath of such events. Demonstration examples of 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. The report is about 90% finished and the final version will be issued in first half of 2017.

Another key activity in WP5.1 was finalising a study on numerical modelling of the 2014 Lake Askja rockslide-induced tsunami. A peer-reviewed paper has been accepted for publication in *Journal of Physical research – Oceans*. The work represents some ground-breaking findings in the physics and mechanics of this type of natural peril.

Coastal Flooding

a) Several tools regarding flood related damage, including methods to assess vulnerability to coastal flooding were finalised and tested in three coastal municipalities in southern Sweden. A study trip to these communities was supported by the NSSA.

b) Hazard modelling (sea level rise/storm surges, river runoff, groundwater, and cloudbursts) was carried out in Odense, Denmark by two master students in close cooperation with the NORDRESS team and co-supervised by WP5.3 staff.

c) Coastal vulnerability to different sea level rise in the capital area of Iceland was mapped by a MSc student supervised by WP 5.3 staff.

d) Finally, a method to estimate return periods of floods based on short time series was developed and tested.

Arctic Maritime Transport

WP5.4 finished the report “A circumpolar study on Maritime Search and Rescue and Maritime Protection” based on reports published by the Emergency Prevention, Preparedness and Response Working Group of the Arctic Council as well as in-depth analyses in each of the relevant countries to identify institutions, groups, and teams involved in Arctic SAR operations.

A study into modes of organizational learning from Search and Rescue Exercises in the Arctic has been started in cooperation with scholars from the University of Trento in Italy.

The main focus of WP5.4 in 2016 was on investigating modes of imagining, discovering and reacting to emerging offshore hazards and vulnerabilities in the Arctic, as NORDRESS members took part in LIVEX16 off the coast of Greenland in the spring of 2016. This included a multisite field study observing the actions of local government and community authorities, as well as police and military during the exercise.

All these studies constitute a PhD thesis which was almost completed in 2016.

Volcanic Ash and Aviation

2016 was devoted to analysing data, writing papers and reports and disseminating findings on how response to airspace contamination can be improved by stakeholder preparedness and cooperation. WP5.5 has worked closely with the Volcanic Ash Advisory Centre in the UK and various

airspace regulatory bodies and agents from the European air industry. Following the success of the 2015 workshop on *Stakeholder Partnership Analysis through Scenario Narratives*, an open workshop was prepared on *Planning Participatory Workshops – a tool kit for qualitative research* and held in Copenhagen in October 2016, with support from the NSSA.

WP6 INSTITUTIONAL RESILIENCE WP6.1 Review and enhancement of the institutional framework for natural hazard management. WP6.2 Natural hazards, social services and the Nordic welfare system.

In 2016 WP6.1 issued the report *Resilience to Natural Hazards: An overview of institutional arrangements and practices in the Nordic countries*. The report (available on NORDRESS web site) describes governance, financial risk sharing, legal scope of hazard and risk assessment, mitigation, awareness raising and education, information management and sharing, and psychosocial support in each of the countries. Information was gathered through desk top research, expert online surveys, interviews with key actors, and expert workshops. The report shows both similarities and differences between the main institutional principles in the Nordic countries. Based on this work, WP6.1 is organizing a special issue of the *International Journal of Disaster Risk Reduction* with the theme *Nordic Models for Coping with Disaster*, aiming for publication in August 2017. The WP6.1 team is very interdisciplinary and multinational, encompassing members from many other WPs and thus acts as a good integrator in the CoE.

As to WP 6.2, its research on social services and the welfare system in times of natural hazards will formally start in 2017, but until now the team has participated in another Nordic project, *Nordic Welfare Watch in Response to Crisis*, which was completed in late 2016 with the report *Local Social Services in Times of Disasters* that includes policy recommendations, presented to the Svalbard Group.

This account of the progress in each WP reflects that NORDRESS is highly **cross-disciplinary**, reflecting the great variety of expertise involved in improving societal resilience to natural hazards. All our teams include experts from many fields and work with practitioners and stakeholders outside academia. Similarly, all our teams comprise researchers from more than one country, often many countries, who have not worked together before. Thus NORDRESS has created many Nordic networks that we hope will last beyond the 5 years of the CoE.

Furthermore, no WP works in confinement, they all work with other, even more than one, WPs in the CoE. The NSSA has been instrumental in creating these bridges. The **added Nordic value** lies in the communication of these people, the transfer of knowledge and expertise between the countries, access to data, opportunities to compare and develop new methods, rules and regulations. For example, the team of snow avalanche experts from the Icelandic Meteorological Office has been invited to join its Norwegian colleagues on field trips to avalanche prone areas in Norway, to get a “hands-on” experience of their methods. Similarly, a Doctoral student from Denmark has spent time with the Icelandic Coast Guard and the Danish Navy in Greenland, another from Finland has studied with the Icelandic Met Office, while the third, from Norway, spent time at the University of Iceland. Icelandic PostDocs have spent time and gained access to both data and advice at Karolinska Institutet in Sweden. Solutions, applicable to all the Nordic countries, have been found to improve hazard monitoring by involving the general public: the Icelandic Meteorological Institute (IMO) has developed and launched an interactive and user friendly, real time GIS-based webpage to which people can send photographs and text, thus adding to the monitoring network of the institution. GEUS, in collaboration with the Danish Meteorological Institute plans to test the IMO prototype in Denmark, and the aim is to develop a mutual Nordic tool to improve hazard monitoring and early warning through public participation.

Examples of how NORDRESS has instigated **cooperation outside the Nordic countries** are the ties with community resilience experts in Tasmania (WP4.2), flooding experts in the Netherlands (4.3

and 5.3), emergency response experts in Italy (5.4), and European aviation authorities and stakeholders (5.5).

NORDRESS makes a point of publishing in **open access** journals, and reserves funds to cover the cost of such publications. As **to interaction with users** of research results, NORDRESS works to a large extent with stakeholders in the respective fields, such as practicing health service providers, and health authorities (General Medical Officer) in WP3; with the National Commissioner of the Icelandic Police, the Department of Civil Protection and Emergency Management, NGO Rescue services, and the Red Cross, as well as with local inhabitants in disaster prone regions in WP4; with Transportation authorities and Landslide warning experts, the Danish Navy, and Municipal authorities in Greenland, and European air industry stakeholders and authorities in WP5; and finally with social service providers and legal experts in WP6. The **gender balance** in the CoE is good. As far as the research goes, no **major obstacles** have been encountered. Our main source of concern is the unfortunate development of exchange rates between the Nordic currencies since 2014.

Governance:

(Up to two paragraphs on governance of your NCoE over the Programme period. Emphasis should be on joint Nordic management and its development in the NCoE.)

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 WP task 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.

Highlights of the research:

(Up to two paragraphs on key developments, during the period of the report)

In **WP3** (Individual resilience) two papers on the effects of natural hazards on mental and physical health were accepted in peer reviewed journals in 2016 and several studies are well underway. One PhD and two MPH theses were defended. In **WP4** three peer reviewed publications on the effects of climate change and extreme weather events on community resilience were published, in addition to two MSc-Theses and Public Webportals. In **WP5** a report on the effects of slope failures on transport infrastructure was prepared and a paper submitted on modelling tsunamis; as well as reports on infrastructure vulnerability to flooding, and a report on circumpolar Maritime Search, Rescue and Protection. 3 MSc students defended their theses. In **WP6** the highlight was the report *Resilience to Natural Hazards: An overview of institutional arrangements and practices in the Nordic countries*, which provides a basis for comparing the systems in the various Nordic countries.

Key findings: (Up to four bullet points summarising key findings)

Following are key findings from each of the four research WPs in 2016:

1. Natural hazards have a significant effect on human health, both physical and mental. This applies to recent events as well as events that took place two decades ago.
2. Empowering local communities in disaster preparation and risk reduction is essential for community resilience.
3. Mitigation strategies to coastal flooding must be tailored to infrastructure vulnerability in the area.
4. Comparing the Nordic social systems regarding natural hazards reveals that the main differences lie in financial risk sharing mechanisms. The effects of this need to be studied further.

Warrant:

(Up to two paragraphs setting out the major arguments on which confidence in your anticipated findings may be based)

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:

See table 2 below

Researcher training and education:

See table 3 below

Output and dissemination:

See table 4 below

Meetings and networking:

(Up to two paragraphs on major meetings, conferences or other events organised by the NCoE)

See table 5 below

Infrastructure and data policy:

(Up to two paragraphs of infrastructure use and needs, including coordination and organisation both within the NCoE and with international stakeholders. Please outline sharing of infrastructures. Please briefly describe the schedule and the progress of open data policy within the NCoE.)

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 OpenDOAR 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 Programme aims: (Not exceeding two A4 pages)

- 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.

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

Second, 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

Third, 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.

Fourth, 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. NORDRESS members involve international partners in their work. For example, the team leader of WP3 spent several months working with colleagues in Berkley in the fall of 2016, and obtained a Research Council Grant for a project that includes coworkers of several nationalities. WP4 has established long term collaboration with an Australian expert on community resilience and natural disasters, who spent months working in Iceland in 2016. She facilitated a study trip of the WP4.2 leader and other NORDRESS colleagues to Australia and Tasmania in the fall where they established contact with natural hazard and community resilience experts, one of whom is invited as key note speaker to the Integrated Disaster Risk Management conference co-organized by NORDRESS in August 2017. WP4.3 met with a group of colleagues at the Sheffield University to explore the possibilities of a joint H2020 proposal. WP5.3 held a workshop in Amersfoort, NL, learning about web-based decision support systems, and WP5.5 has instigated a widespread cooperation between European air traffic controllers and other air industry stakeholders. Finally, NORDRESS is linked to numerous international research projects that provide good 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 programme

NORDRESS members scrutinize opportunities offered by H2020, and have taken part in exploratory meetings to prepare applications.

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, such as 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.

In order to reach beyond the CoE itself, NORDRESS publishes its findings in academic journals, books and reports. It reaches out to other stakeholders through meetings 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:

(Please provide two paragraphs on your impact strategies and plans, clarifying whether these are tangible or indicative. Please include the features of your strategies which are unique to your project.)

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:

What may catch media attention is the development of a GIS-based web-page to allow users to upload photographs of flooding. This device, launched by the Icelandic Meteorological Office (IMO), is being tested in other Nordic countries with the aim of developing a tool of use for all Nordic countries and beyond.

The web-page uses cloud-managed GIS services to provide an interactive map, allowing users to pin-point the location of a flood via three alternative methods. First, users can simply enter the beginning of an address into a search command, from where address details are retrieved. Second, for users of mobile devices such as a telephone or tablet, there is an option of auto-location, based on the device's inbuilt GPS. This option yields accurate geographic co-ordinates, the location of which is then displayed on an interactive map. A third option includes manually locating the photographer's location on an interactive map. This is performed by simply moving the marker-symbol via the mouse pointer. The auto-locate option is especially useful for photographs taken on a smartphone with location-services enabled. Internet-based locations are less reliable, and their accuracy varies depending on location and service provider.

Alongside geographic data, the notification page requires the name of the photographer, the date the photograph was taken, the photograph itself, and an optional comment. Provision has been made for the upload of standard image formats up to 10 MB in size. The design of the page allows it to be used in a real-time or retrospectively; this greatly expands the potential for public notifications about flooding. Uploaded images are stored in database at the respective institute, and work is ongoing on methods for notifying specialists that an image has been uploaded. One option could be a separate map-based display at the institute to indicate the location of public notifications.

The page was put into full operational use in October 2016 during a period of prolonged, heavy rainfall in Iceland, which caused widespread flooding in the south and south-west of the country. The first version of the notification page was in Icelandic, and it was linked to from IMO's home-page (see:

<http://vatnsflod.vedur.is/>). The page was also publicised to foreign tourists via a short press-release on the English version of IMO's site; see: <http://en.vedur.is/about-imo/news/reporting-floods-well-appreciated>.

The usefulness of the notification page is obvious, as flood monitoring networks cannot extend to all possible flood locations. On the other hand, people involved in recreational activities such as jeep tours or snow-scooter trips cover large, often remote, areas. Photographs from such locations could serve as upstream

observations of potentially hazardous conditions, such as the beginning of intense snow-melt. By providing a mobile-compatible site for convenient upload of photographs and comments, this real-time flood monitoring can be expanded via public participation in the recognition and documentation of hydrological or other weather related hazards.

Supplementary funding:

(One paragraph indicating any use of, or plans for use of, supplementary funding for user engagement, impact, communication activities, capacity building or inter-project liaison activities.)

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 CLIPS, ENHANCE, ClimRes, REALTIDSVARSLING, INTACT, ELASTINEN, Natural Disasters and Long-term Health Outcomes, and others.

Programme evaluation:

(Up to two paragraphs of feedback to the NordForsk, Programme Committee, Scientific Advisory Board with affirmation, critique, suggestions, etc, to assist in Programme self-evaluation and development.)

We have no special comments on the work and procedures of NordForsk, the Programme Committee or the Scientific Advisory Board, which provided us with very useful comments and advice at our first meeting in June 2016.

Last year, however, we made a suggestion that would have made our management work easier. **We are disappointed to see that no attention seems to have been paid to this suggestion, and this issue costs us as much extra work this year as last.** In the hope that it will get through this time we allow us to repeat it: **CONSISTENCY** in the classifications used in the application form and the reporting forms would help. **Using one classification regarding work contribution (e.g. manmonths) instead of varying between manmonths, workhours or manyears, depending on table.** This also applies to professional categories – e.g. regarding professors and senior researchers; or doctoral students and/or postgraduate students. These may seem like minor issues, but they cost a lot of extra calculations and difficulties in comparing planned activities with actual activities.

Requests for Programme support:

(One paragraph indicating, if appropriate, how you and your team would value support from NordForsk)

NORDRESS is a large CoE with 13 WPs and close to 60 partners, who are prepared to assist each other. Thus we have not needed to seek advice directly to the NordForsk Programme Committee. The Scientific Advisory Board provided very useful advice on our first meeting in June 2016.

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 person years in total and the number of person years 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	SIG
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	19	20,132	0,818
Senior researchers (other than above)	25	19,674	8,662
Postdoctoral researchers	5	28,660	21,580
Postgraduate students	9	30,905	14,576
Other academic personnel	0	0	0
Auxiliary personnel (office, technical, other personnel)	4	17,308	12,804

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. Please note that the definition of mobility as minimum 2 weeks does not apply well to NORRESS. Often our researchers need to meet for a shorter while. All mobility and meetings of the researchers in NORRESS are supported by the NSSA, be it for short or long durations. This arrangement has proven very useful.

Name, job title, organisation	Site of work	Purpose of visit	Duration of visit	Comments, output of the visit
I. WP. 4.2 Deanne Bird, Research analyst, UI	Natural hazard prone areas in Southern Iceland	Interviews and meetings with the Icelandic Department of Civil Protection and Emergency Management, the Chief of Police and Chief Superintendent for the southern region of Iceland, local residents / tourism operators and tour guides in that region. Site visits to hazard prone areas to further understanding of vulnerabilities and risk mitigation efforts.	48 days	The study improves understanding of social, economic, cultural and political factors affecting people's decision-making during a crisis.
II. WP 4.2 Guðrún Gísladóttir, professor (WP leader), UI	South Iceland	Preparing a lengthy field work session in Southern Iceland.	3 days	One day was spent in South Iceland establishing contacts with local authorities, the Chief of Police and Chief Superintendent to prepare the field work carried out by Deanne Bird (see next NSSA grant) The rest of the mobility grant will be used in 2017.
III. WP 4.2, Deanne Bird, Research analyst, UI	Tasmania	Review risk perceptions, decision-making and communication of warnings during fire and flood crises in Tasmania.	8 days	Contact was establish with experts in the field of emergency response and recovery, who focus on community-led disaster risk reduction planning, recognising the importance of empowering local residents with knowledge, resources and techniques to reduce their own risks and thus develop strategies more suited to local needs (for example, see

				http://www.bushfirereadyneighbourhoods.tas.gov.au/). A similar approach is being applied in Southern Iceland with respect to volcanic risk reduction.
IV. WP 4.2. Guðrún Jóhannesdóttir Project manager, ICEPEM & Guðrún Gísladóttir, professor (WP leader), UI	Melbourne, Victoria, Canberra and Tasmania Australia	Visit Emergency Management Organizations in Australia and learn about disaster preparedness and prevention, response and recovery	21 days	The study trip gave WP 4.2 a valuable opportunity to compare risk management procedures in Iceland and Australia, which in many ways place a similar emphasis on empowering local communities. The objective of WP 4.2. is to enhance community resilience to natural hazards and learning from The Australian Emergency Management was an invaluable contribution towards that aim.
V. WP 3.1. Edda Björk Þórðardóttir, Post. doc. UI & Berglind Guðmundsdóttir, Psychologist, National University Hospital of Iceland	Iceland, UI	The grant was used to invite Dr. J. Shepard to attend a working session with WP3, where she is a valued member. In the meeting the groundwork was laid for a project to develop early intervention for victims following disasters.	6 days	The visit was very useful to discuss various possibilities for the development of WP3. Having access to an internationally expert like Dr. J. Shepard is valuable.
VI. WP 3.1. Edda Björk Þórðardóttir, Post. doc. UI	Medical Epidemiology and Biostatistics Department (MEB) at Karolinska Institutet, Sweden.	To work on the WP3 study on natural hazards and health (the Swedish tsunami database). An important part of the visit was having access to a key statistician who is familiar with the registry data on the Swedish tsunami survivors.	9 days	With assistance from Fang Fang, assistant professor in neuro-epidemiology and Rouqing Chan, who is experienced in working with registry data and the statistical program SAS, Edda worked on retrieving the tsunami survivor database as well as the Swedish registries for sleep disorders and medication use. At the end of her visit, Edda had retrieved data for the exposed group which she will use in her post-doctoral studies.
VII. WP 3 Edda Björk Þórðardóttir, Post. doc. UI	Medical Epidemiology and Biostatistics Department	To attain the rest of the data for the tsunami studies and receive assistance in learning how to work with the registry data with scientists who have previously worked with this study	5 days	At the end of the stay, the unexposed group had been retrieved from the national registries. Edda had now received a VDI account, i.e. international remote access to the data she is

	nt (MEB) at Karolinska Institutet	population (Swedish tsunami database).		working on, enabling her to work with the dataset for her postdoctoral project in Iceland.
VIII. WP 4.1. Silje Aurora Andresen, PhD student, NTNU	COPE, University of Copenhagen	The overall aim is to investigate how important factors in preparing for, acting during and recovering after a disaster are perceived and enacted at different scales.	2-3 months in the spring 2017	May 2017
IX. WP 5.4 Rasmus Dahlberg, Ph.D student, COPE	University of Iceland	Participation in a table top exercise about cruise ships safety and Mass Rescue Operations organised by Association of Arctic Expedition Cruise Operators (AECO) and the Icelandic Coast Guard	2 days in April	The participation enlarged the professional network and increased knowledge on capacities, policies and strategies of SAR providers and cruise operators.
X. WP 5.4 Rasmus Dahlberg, Ph.D student, COPE	The Greenland coast line from Scoresbyund to Daneborg	On-site observations and prolonged discussions with experienced naval officers who act as first responders during SAR accidents	20 days	The captain of the vessel KNUD RASMUSSEN provided vital information during the writing of the draft for chapter for an edited volume of case studies in emergency management, to be published in 2017 by Elsevier.
XI. WP 6.2 Ingibjörg Lilja Ómarsdóttir, Ph.D student, UI	University of Gothenburg, meeting with Hanne Crage Karlsen	Hanne Krage Carlsen is a member of WP 3 in NORDRESS and it was good to have an opportunity to go through issues of mutual interest between WP 3 and WP6. The further objective of the meeting was to explore whether the University of Gothenburg, School of Social Work emphasizes disaster social work, and in particular emergency management systems, also, to learn about the involvement of social services in emergency management and preparedness in Gothenburg area.	One day meeting	The School of Social work does not focus on disaster social work and opportunities for learning from social services in the Gothenburg area need to be explored further.
XII. WP 4.3 Peter van der Keur, Senior researcher, GEUS	Venice, Italy	Participation in COWM2016 conference in combined with task 4.3 workshop and side event.	3 days	Papers submitted to the conference were published in the COWM2016 proceedings and have enriched the state-of-the-art mapping on the citizen involvement in disaster management in Task 4.3. Also participating in the conference helped NORDRESS gain attention

				in the “citizen observation” community.
XIII. WP 4.3 Peter van der Keur, Senior researcher, GEUS	Sheffield University , UK	To explore opportunities to take part in joint efforts for EU funded project on the subject of citizen science and participatory modelling and monitoring.	1 day	The Sheffield meeting clarified the overall topics included in the upcoming Horizon SC5-19-2017 call. However, after lengthy negotiations and trials it turned out that none of the partners were prepared to take a leading role in organizing a proposal.
XIV. WP 5.1 Sigríður Sif Gylfadóttir, Specialist, IMO	Oslo, NGI	To finalize a numerical model of the 2014 Lake Askja tsunami in collaboration with specialists at NGI.	31 days	During the visit, the numerical model was polished and a draft of a paper completed. In the months following the visit, the paper has been completed and submitted to JGR-Oceans where it is undergoing a review process. Thus, the original objectives of the project have been fulfilled.
XV. WP 3.3. Tóra Petersen, Postdoc. SDU	Iceland, University of Iceland and to The University hospital of Iceland.	To collect existing knowledge and experiences of psychosocial interventions following disasters in the Scandinavian countries. This will be done through institutional visits and interview with key researchers and clinicians, this time in Iceland.	7 days	
XVI. WP 6.1 Atte Erik Harjanne, PhD student, FMI	Iceland, University of Iceland and Icelandic Meteorological Office	To prepare writing of two research papers and to strengthen ties and co-operation between Finnish and Icelandic research institutions.	21 days	One manuscript was completed and draft of another prepared to be published in a special issue of International Journal of Disaster Risk Reduction. Three interviews were conducted (Ministry for the Environment, Icelandic Tourist Board, Icelandic Meteorological Office). Research seminars at the University of Iceland and the Icelandic Meteorological Office. To part in planning and preparing the NORDRESS workshop of acceptable risk (30.11.-1.12.2016, Reykjavik) and held a workshop on scenario planning and uncertainty at the Energy economics course at University of Iceland.

Number of:	
Visiting months	6
Visiting researchers	17

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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
I. WP 5.5 Planning participatory workshops – a tool kit for qualitative research, University of Iceland, Guðmundur Freyr Úlfarsson, professor, UI.	5	13	0
II. WP 4.3 & 6.1 Workshop on Risk Assessment and Acceptable Risk .Peter van der Keur, Senior researcher, GEUS, Hans J. Hendriksen, Senior advisor, GEUS, Sigrún Karlsdóttir, Director of Natural Hazards, IMO	3	3	0
III. WP 6.2, Disaster social work: Resilience and crisis management in the context of welfare states. Guðný Björk Eydal, professor, UI	5	15	3-5

How many PhDs and Post Docs are recruited in Nordic countries (specify the country) and how many are recruited internationally?

Number of PhD students recruited in Nordic countries (specify the country)	9
Number of PhD students recruited outside Nordic countries	1
Number of Post Docs recruited in Nordic countries (specify the country)	3
Number of Post Docs recruited outside Nordic countries	1

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

Number of PhD degree achieved	1
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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. Edda Björk Thordardóttir, 2016. Long-term health consequences of avalanches in Iceland in 1995: A 16 year follow-up. PhD in Public Health, University of Iceland.

MSc theses:

1. Mie Thomsen, 2016. Community resilience in a Danish coastal context. A case study of Løgstør and Thyborøn, Norwegian University of Science and Technology.

2. Bergþóra N. Guðmundsdóttir, 2016. Best practices in Icelandic crisis communication during volcanic eruptions: development of a tentative framework. University of Iceland.

3. Harpa Þorsteinsdóttir, 2016. Project: Children's health following Eyjafjallajökull volcanic eruption: A prospective cohort study in 2010 and 2013. Master of Public Health (MPH), University of Iceland.

4. Hole, Øyvind, 2016. Hydrological modelling of the urban environment in Odense and the impact of forced infiltration and climate change. University of Copenhagen.

5. Negus, Andrew, 2016. Building resilience to extremity and climatic changes investigating the phenomena of Compound Events. University of Copenhagen.

6. Nancy Guarderas, 2016. Multicriteria risk evaluation of coastal flooding in the greater Reykjavik area, Iceland. Faculty of Earth Science, University of Iceland.

Table 4 A. Outreach and dissemination of activities/collaboration mainly funded by NORDRESS

Peer reviewed scientific publications / of which Open Access	
Non peer reviewed scientific publications / of which Open Access	Thomsen, M., 2016. Community resilience in a Danish coastal context. A case study of Løgstør and Thyborøn. M.Sc. Thesis, Norwegian University of Science and Technology.
Reports	Vullierme, M., 2016. Mapping of Arctic Offshore Hazards and Vulnerabilities – A Circumpolar Study on Maritime Search and Rescue and Maritime Protection. Copenhagen Center for Disaster Research, pp. 1-67.

	Harjanne A., Pagneux E., Flindt Jørgensen L., Adriaan Perrels A., van der Keur P., Nadim F., Rød J.K., Raats E., 2016. Resilience to natural hazards: An overview of institutional arrangements and practices in the Nordic countries. NORDRESS WP6.1 report, pp. 1-65, (available on NORDRESS webpage).
Non-academic publications	
Invited conference presentations	
Conference presentations oral / poster	Thomsen, M., 2016. Coastal community resilience in climate adaptation and risk reduction. Presentation at the 4th Nordic Conference on Climate Change Adaptation 29-31 August, Bergen. Workshop in NL-Amersfoort 14/1 2016 COWM2016 conference June 7-9 Venice Italy Harjanne, A., Tuomenvirta, H., Ervasti, T., Karhu, J.A., 2016 “Combining science, learning and environmental observations – Lessons learned from a Finnish science education project”, COWM2016 Conference June 7-9.
Media appearances Non-academic publications	•
Outreach and dissemination to the public	•
Web disseminations	•
Conferences arranged	Van Well, L, Danielsson P, (WPs 4.2, 5.3), 2016. Session on “Constituting Local Knowledge of Natural Disasters in Climate Adaptation” planned and accepted to the ECCA 2017 conference
Courses/Seminars arranged	WP 5.3, 2016 Study tour South Sweden to three municipalities. WP 6.1, 2016. Workshop to analyse data and prepare for publication of the report: Resilience to natural hazards: an overview of institutional arrangements and practices in the Nordic countries. Workshop held at the FMI, Helsinki, 28-29 January 2016. WPs 4.3, 6.1, 2016. Workshop on Risk Assessment and Acceptable risk held at IMO in Reykjavík 30 November -1 December 2016

Table 4 B. Outreach and dissemination of activities/collaboration where NORDRESS has contributed

Peer reviewed scientific publications / of which Open Access	Hlödversdóttir H, Pétursdóttir G, Gislason Th, Carlsen HK, Hauksdóttir A., 2016. Long-term health effects of the Eyjafjallajökull volcanic eruption: A prospective cohort study in 2010 and 2013. BMJ Open – BMJ Open, Sep 8. doi: 10.1136/bmjopen-2016-011444.
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	<p>Thordardottir EB, Valdimarsdottir UA, Hansdottir I, Hauksdóttir A, Dyregrov A, Shipherd JC, Elklit A, Resnick H, Gudmundsdottir B., 2016. Sixteen-year follow-up of childhood avalanche survivors. <i>Eur J Psychotraumatol</i>, 7:30995. http://dx.doi.org/10.3402/ejpt.v7.30995</p> <p>Thordardottir EB, Hansdottir I, Valdimarsdottir UA, Shipherd JC, Resnick H, Gudmundsdottir B., 2016. The Manifestations of Sleep Disturbances 16 Years Post-Trauma. <i>Sleep.</i> , 39:1551-4. doi: 10.5665/sleep.6018.</p> <p>Thordardottir EB, Hansdottir I, Shipherd JC, Valdimarsdottir UA, Resnick H, Elklit A, Gudmundsdottir R, Gudmundsdottir B. J., 2016. Risk Factors for Posttraumatic Stress Symptoms Among Avalanche Survivors: A 16-Year Follow-Up. <i>Nerv Ment Dis.</i>, 204:298-305. doi: 10.1097/NMD.0000000000000475.</p> <p>Bird, DK, McLeman, R, Gísladóttir, G, Kelman I, Næss MW, Pétursdóttir G, Jóhannesdóttir, G., 2016. Climate change and settlement level impacts, In: Taylor A, Carson D, Ensign P, Huskey L, Rasmussen R, (Eds.) <i>Settlements at the Edge: Remote Human Settlements in Developed Nations</i>. Edward Elgar, UK, 293-319.</p> <p>Sinikumpu JJ, Pokka T, Hyvönen H, Ruuhela R, Serlo W, 2016. Supracondylar humerus fractures in children: the effect of weather conditions on their risk. <i>Eur J Orthop Surg Traumatol</i>, doi 10.1007/s00590-016-1890-8.</p> <p>He X, Stisen S, Wiese MB, Henriksen HJ, 2016. Designing a hydrological real-time system for surface water and groundwater in Denmark with engagement of stakeholders. 30: 1785-1802. <i>Water Resources Management (DOI: 10.1007/s11269-016-1251-8)</i>.</p>
<p>Non peer reviewed scientific publications / of which Open Access</p>	<p>Edda Björk Thordardóttir, 2016. Long-term health consequences of avalanches in Iceland in 1995: A 16 year follow-up. PhD in Public Health, University of Iceland, June 7th 2016.</p> <p>Bergþóra Njála Guðmundsdóttir, 2016. Best practices in Icelandic crisis communication during volcanic eruptions: development of a tentative framework. MSc Thesis, University of Iceland.</p> <p>Øyvind Hole 2016. Hydrological modelling of the urban environment in Odense and the impact of forced infiltration and climate change. Master thesis, University of Copenhagen.</p> <p>Andrew Negus, 2016. Building resilience to extremity and climatic changes investigating the phenomena of Compound Events. Master thesis, University of Copenhagen</p> <p>Nancy Guarderas, 2016. Multicriteria risk evaluation of coastal flooding in the greater Reykjavik area, Iceland. MSc thesis, Faculty of Earth Science, University of Iceland.</p> <p>Harpa Þorsteinsdóttir, 2016. Project: Children's health following</p>

	<p>Eyjafjallajökull volcanic eruption: A prospective cohort study in 2010 and 2013. Master of Public Health (MPH), University of Iceland.</p> <p>Reichardt U, Úlfarsson GF, Pétursdóttir G, 2016. Air industry response to volcanic eruptions. In: Aerts J, Mysiak J, (eds.), Novel Multi-Sector Partnerships in Disaster Risk Management, ENHANCE Project, Brussels, 343 p. http://www.enhanceproject.eu/news/articles/154</p>
<p>Reports</p>	<p>Hove Midtbust LG., Dyregrov A, 2016. Communicating with children and adolescents about natural disasters: What do we know? Report. Center for Crisis Psychology.</p> <p>Carter H T, Groundstroem F, Haavisto R, Haanpää S, Halonen M, Harjanne A, Hildén M, Jakkila J, Juhola S, Jurgilevich A, Kokko A, Kollanus V, Lanki T, Luhtala S, Miettinen I, Mäkelä A, Nurmi V, Oljemark K, Parjanne A, Peltonen-Sainio P, Perrels A, Pilli-Sihvola K, Punkka A-J, Raivio T, Räsänen A, Säntti K, Tuomenvirta H, Veijalainen N & Zacheus O, 2016. Keinot edistää sää- ja ilmatoriskien hallintaa. (Measures to promote the management of weather and climate related risks. Abstract in English.) Valtioneuvoston selvitys- ja tutkimustoiminnan julkaisusarja 47/2016. 36 s.</p> <p>Harjanne A, Haavisto R, Tuomenvirta H, Luhtala S, Mäkelä A, Gregow H, Halonen M, Raivio T, Hildén M, Parjanne A, Jakkila J, Juhola S, Räsänen A, Haanpää S, Jurgilevich A, Peltonen-Sainio P, Lanki T, Miettinen I, Zacheus O, Kollanus V, 2016. Sää- ja ilmatoriskien hallinta ja tietolähteet Suomessa. (Management of weather and climate risks and the use of related information sources in Finland. Abstract in English.) Ilmatieteen laitoksen julkaisusarja 2016:6. 111 s.</p> <p>Pilli-Sihvola K, Haavisto R, Nurmi V, Oljemark K, Tuomenvirta H, Groundstroem F, Juhola S, Miettinen I, Gregow H, 2016. Taloudellisesti tehokkaampaa sää- ja ilmatoriskien hallintaa Suomessa. (Efficient weather and climate risk management in Finland. Abstract in English.) Valtioneuvoston selvitys- ja tutkimustoiminnan julkaisusarja 45/2016. 68 s.</p> <p>Hildén M, Groundstroem F, Carter T R, Halonen M, Perrels A, Gregow H, 2016. Ilmastonmuutoksen heijastevaikutukset Suomeen. (Crossborder effects of climate change in Finland. Abstract in English.) Valtioneuvoston selvitys- ja tutkimustoiminnan julkaisusarja 46/2016. 62 s.</p> <p>Dahlberg R, Lauta KC, Sørensen B R, Vendelø M T, 2016. Offshore is Onshore: Scalability, Speed and Synchronization in Arctic SAR. Copenhagen Center for Disaster Research.</p> <p>Reichardt, U., Úlfarsson G.F., Pétursdóttir, G., 2016: Case study synthesis and policy recommendations—Air industry response to volcanic eruptions (Iceland and Europe). University of Iceland, European Commission, Grant Agreement no. 308438, pp 1-21</p> <p>Eydal GB, Ómarsdóttir IL, Björngren Cuadra C, Dahlberg R, Hvinden B, Rapeli M, Salonen T, 2016. <i>Local Social Services in Nordic Countries in</i></p>

	<p><i>Times of Disaster: Report for the Nordic Council of Ministers</i>. Reykjavík: Ministry of Welfare. https://eng.velferdarraduneyti.is/media/velferdarvakt09/Local_Social_Services_in_Times_of_Disaster.pdf</p>
Non-academic publications	<p>Jex C, 2016. New model can help predict flooding two days in advance. ScienceNordic. 5 January 2016.</p>
Invited conference presentations	<p>Bird D, 2016. Measuring resilience. Risk, Reform, Resilience - Monash University Disaster Resilience Forum – Clayton, Melbourne – November 2016.</p> <p>Eydal GB, 2016. Risk and disaster management in Nordic welfare states: The role of local social services. Reykjavík November 10th NWW final conference: Are the Nordic countries prepared for future risks?</p> <p>Eydal GB, 2016. Local Social Services in Nordic Countries in Times of Disaster. Svaldbardgruppen: Strategy Workshop, Helsinki, 13 December 2016.</p>
Conference presentations oral / poster	<p>Pétursdóttir G, Hlöðversdóttir H, Carlsen HC, Hauksdóttir A, 2016. Long term health effects following the Eyjafjallajökull eruption: A prospective cohort study in 2010 and 2013. The Annual Nursing Conference, held by The Institute of Nursing Science in Iceland, January 14th 2016.</p> <p>Andresen SA, 2016 Dichotomies of Knowledge, Power and Structure: Narratives of Preparedness and Emergency Services after the Lærdal Fire. Paper presented at the Nordic Ruralities: Crisis and Resilience 2016, Akureyri</p> <p>Lein H, 2016. Om kartlegging og visualisering av sårbarhet og resiliens i Norske kommuner. Presentation at the Byutviklingsseminar - Klimatilpassning i Trondheim commune, Trondheim 2016.</p> <p>Jóhannesdóttir G, 2016. Community based disaster risk reduction. Emergency Management in Iceland and Sweden. Reykjavík, 18 January 2016</p> <p>Gísladóttir G, Jóhannesdóttir G, 2016. Residents' risk perception of and response to SO₂ risk in east Iceland during the volcanic eruption in Bárðarbunga/Holuhraun 2014-2015. European Geosciences Union (EGU), 17-21 April 2016, Vienna, Austria.</p> <p>Gísladóttir G, and Jóhannesdóttir, 2016. Residents' risk perception of and response to SO₂ risk in east Iceland during the volcanic eruption in Bárðarbunga/Holuhraun 2014-2015. NordForsk Reykjavík, June 2016.</p> <p>Gísladóttir G, Bird D, 2016. Impacts of the 2010 Eyjafjallajökull eruptions on the local communities. Seminar PARAGEO June 25, Reykjavík.</p> <p>Ruuhela R, Jylhä K, Pirinen P, Simola H, Drebs A, Fortelius C, 2016. Spatial Meteorological Information for Built Environment in the Changing Climate of Finland. Proceedings of the CIB World Building Congress 2016 in June, Tampere, Finland. Vol IV: Understanding impacts and functioning of different solutions, pp. 619-630. http://urn.fi/URN:ISBN:978-952-15-3744-8.</p>

	<p>Gregow H, 2016. Ennakoiva lyhyen aikavälin sää-,talous- ja ilmatoriskienhallitseminen (ELASTINEN-hanke) Lämpimästi tervetuloa hankkeen päätösseminaariin! Final seminar presentations (in Finnish) 2016: Sää- ja ilmatoriskien hallinta ja mahdollisuudet - ELASTINEN-hankkeen loppuseminaari, Helsinki (pdf)</p> <p>He X, Stisen S, Wiese MB, Henriksen HJ , 2016. Designing a hydrological real-time system for surface water and groundwater in Denmark with engagement of stakeholders. 30: 1785-1802. Water Resources Management (DOI: 10.1007/s11269-016-1251-8).</p> <p>Harjanne A, Ervasti T, Tuomenvirta H, Karhu JA, 2016.High schoolers as researchers – Results from a Finnish science education project. EMS-ECAC2016 Conference, Trieste 12–16 September.</p> <p>Gylfadóttir SS, Kim J, Helgason JK, Brynjólfsson S, Höskuldsson Á, Jóhannesson T, Harbitz CB, Løvholt F,2016. <i>"The 2014 Lake Askja rockslide tsunami – optimization of landslide parameters comparing numerical simulations with observed run-up"</i>. EGU General Assembly 2016 (Vienna)</p> <p>Dahlberg R, 2016. Offshore is Onshore. Presentation at International Conference on Natural Hazards and Infrastructure, June 28.- 30. 2016, Crete, Greece.</p> <p>Dahlberg R, Lauta K C, Sørensen B R, Vendelø M T, 2016. Greenland Livex 2016; multidisciplinary field study in disaster research. Presentation at COPE, November 25. 2016.</p> <p>Reichardt U, Úlfarsson GF, Pétursdóttir G, 2016. Volcanic ash and aviation— stakeholder partnership analysis in Europe. The 25th Society for Risk Analysis-Europe Conference, Understanding Risk: From Theory to Application in Policy and Practice. Bath, England, June 20–22.</p> <p>Reichardt U, Úlfarsson GF, Pétursdóttir G, 2016. Volcanic Ash and Air Traffic Developments in European Airspace since 2010. Vísindadagur, Verkfræði-og náttúruvísindasvið, Háskóla Íslands, Reykjavík, Íslandi, 29. október.</p> <p>Reichardt U, Úlfarsson GF, Pétursdóttir G, 2016. Ash and aviation in Europe: Stakeholder partnership analysis through scenario narratives. Þjóðarspejillinn, Rannsóknir í félagsvísindum XVII, Félagsvísindasvið Háskóla Íslands, Reykjavík, Íslandi, 28. október.</p> <p>Reichardt U, Úlfarsson GF, Pétursdóttir G, 2016. Volcanic ash and air traffic - Improving resilience of the air industry to volcanic ash. Vísindadagur, Verkfræði- og náttúruvísindasvið, Háskóla Íslands, Reykjavík, Íslandi, 29. október.</p> <p>Klovning L, 2016. Social capital in post-disaster recovery, <i>NWW seminar</i> University of Iceland 25th of February.</p>
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	<p>Cuadra C, Rapeli M, 2016. Local Social Services in Times of Disaster. <i>SWSD 2016 conference</i> Seoul 27-30 June.</p> <p>Eydal GB, Björngren Cuadra C, Dahlberg R, Hvinden B, Ómarsdóttir IL, Rapeli M, Salonen T, 2016. Social Services in Five Nordic Countries in Times of Disaster. <i>3rd ISA Forum of Sociology</i>. July 10-14th Vienna Austria.</p> <p>Ómarsdóttir, IL., Eydal GB. 2016. Félagsþjónustan og almannavarnakerfið Norrænn samanburður. <i>Þjóðarspejill</i> 28th of October, University of Iceland.</p>
Media appearances	<p>Ruuhela R, 2016. A press release. New mapping tool shows where the elderly may be vulnerable to climate change (http://en.ilmatieteenlaitos.fi/press-release/279340056)</p> <p>IMO (WP4.3), 2016. Reporting floods well appreciated. Prolonged intense rainfall and subsequent flooding - recording events. http://en.vedur.is/about-imo/news/reporting-floods-well-appreciated</p> <p>Gregow H, 2016. A press release on how Weather and climate risks should be managed efficiently (2.12.2016) http://vnk.fi/artikkeli/-/asset_publisher/saa-ja-ilmastoriskeja-tulisi-hallita-tehokkaasti?_101_INSTANCE_OQ3OcOALUpyv_languageId=en_US</p>
Outreach and dissemination to the public	<p>Harjanne A, Liikutu Tieteestä , 2016. (“Get touched by science”), Finnish national science communication awards finals, Helsinki, May 31, Finalist position, oral presentation.</p> <p>Ruuhela R, 2016. A presentation related to World Food Day in the seminar organised by the Ministry of Agriculture and Forestry with a theme on how weather and climate services can help in securing food safety (Nov 2, 2016).</p> <p>Dahlberg R, 2016. “Offshore is Onshore” – the need for effective coordination and resource management in large-scale search and rescue operations in the Arctic. Presentation at: How do we secure sustainable and safe maritime activities in the Arctic. April 11., Nordic Council of Ministers, Copenhagen.</p> <p>Reichardt U, Pétursdóttir G, Úlfarsson G F, 2016. Air industry response to volcanic eruptions. Research Seminar, UK Met Office, Exeter, UK, June 23, 2016.</p> <p>Reichardt U, Úlfarsson GF, Pétursdóttir G, 2016. Volcanic Ash and Air Traffic Developments in European Airspace since 2010. Vísindadagur, Verkfræði- og náttúruvísindasvið, Háskóla Íslands, Reykjavík, Íslandi, 29. október.</p> <p>Project website for the Nordic Welfare Watch published information about the project activities at https://eng.velferdarraduneyti.is/nordicwelfarewatch/in-response-to-crises/</p> <p>All lectures from <i>Communities coping with Crisis in Grímsnes</i> 20-22 of April</p>

	<p>2016 accessible at: https://eng.velferdarraduneyti.is/nordicwelfarewatch/in-response-to-crises/nr/35809</p> <p>Eydal GB, 2016. Disasters and the role of local social services <i>Open meeting about the Nordic Welfare Watch September 17th.</i></p>
Web disseminations	<p>Ruuhela R, 2016. Adaptive capacity and vulnerability to climate change. Climateguide.fi. An interactive webpage to examine adaptive capacity and vulnerability to climate change http://ilmasto-opas.fi/en/datat/sopeutumiskyky-ja-haavoittuvuus</p> <p>Icelandic Meteoerological Office (IMO Task4.3), 2016. Tilkygning um vatnsflóð (Notification on flooding). Interactive user friendly real time GIS-based webpage about early warning and monitoring networks. http://vatnsflod.vedur.is/</p> <p>Henriksen HJ, 2016. Landsdækkende system til forbedret varsling af oversvømmelser i byer. EVA, 2 (29), 26-35 (In Danish) http://evanet.dk/Pdf/Blade/2016_02_EVA_blad.pdf</p> <p>Reichardt U, Úlfarsson GF, Pétursdóttir G, 2016: Air industry response to volcanic eruptions. In: Aerts, J., and Mysiak, J. (Eds.), Novel Multi-Sector Partnerships in Disaster Risk Management, ENHANCE Project, Brussels, 343 p. http://www.enhanceproject.eu/news/articles/154</p>
Conferences arranged	<p>Van Well, L Danielsson P, (WPs 4.2, 5.3) 2016. Klimatanpassning Sverige, Stockholm 7 September. Van Well organized the conference programme and organized and moderated the session Framgångsrecept för samverkan. Collaborators: District authorities of Kronobergslän, the Swedish Environmental Protection Agency and SGI. http://www.aktuellhallbarhet.se/konferens/klimatanpassning-2016/</p> <p>WP5.3, 2016. Kustmöte 2016, Ängelholm.</p> <p>WP6.1, 2016. Are the Nordic Welfare states prepared for future risks? The Nordic Welfare Watch final conference in Iceland the 10th of November, 2016 Hilton Nordica</p>
Courses/Seminars arranged	<p>WP5.5, 2016. Planning participatory workshops – a tool kit for qualitative research, Copenhagen October 20-21, 2016</p> <p>WP6.1, 2016. Emergency Management in Iceland and Sweden NWW Symposium, University of Iceland 18th of January, 2016.</p> <p>WPs 6.1, 6.2, 2016. Communities coping with Crisis in Grímsnes 20-22 of April 2016 [https://eng.velferdarraduneyti.is/nordicwelfarewatch/in-response-to-crises/nr/35809]</p> <p>WP 6.1, 2016. Voluntary organizations in in Disaster – NWW Symposium University of Iceland, Reykjavík 25 April, 2016</p> <p>Cuadra C, Eydal GB, (session organizers), 2016. Local Social Services in</p>

	Times of Disasters. 3 rd ISA Forum of Sociology. July 10-14 th , 2016, Vienna Austria.
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Table 5: Meetings and networking

Number of workshops with invited speakers, conferences and other academic events organised by the NCoE: Please note that in the case of NORDRESS networking comprises much more than academic events. Establishing contact, trust and cooperation with non-academic stakeholders such as local authorities, surges and rescue, and civil protection agents is of prime importance to name but a few. We therefore include in table 5 such meetings as networking activities important to our Coe.

Workshops	<ol style="list-style-type: none"> 1. Planning participatory workshops – a tool kit for qualitative research, October 20-21 2. Risk assessment and acceptable risk, December 1 3. A workshop with NordSteva, Center of Excellence, June 22 4. A workshop discussion the role of Nordic welfare system in the context of natural disasters, December 12 5. Amersfoort, workshop on web-based decisions support systems, January 14 6. Klimatanpassning Sverige, organized and moderated the session Framgångsrecept för samverkan, September 7 7. Kustmöte 2016, Ängelholm 8. Are the Nordic Welfare states prepared for future risks? NWW final conference, November 10 9. Emergency Management in Iceland and Sweden NWW Symposium, January, 18 10. Communities coping with Crisis in Grímsnes, April 20-22 11. Voluntary organizations in Disaster – NWW Symposium, April 25 12. Local Social Services in Times of Disasters. 3rd ISA Forum of Sociology, session organized, July 10-14
Conferences	<ol style="list-style-type: none"> 1. NORDRESS, annual meeting, May 9
Other academic events	<ol style="list-style-type: none"> 1. Study tour to South Sweden to discuss flooding with local authorities and experts, 17-19 May 2. Several meetings with various stakeholders in disaster risk management in Australia and Tasmania, October and November 3. Meetings with stakeholders in disaster and risk management in South Iceland, August and September
Total	19