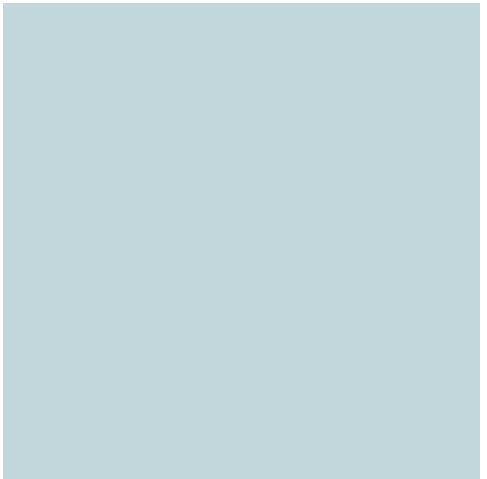
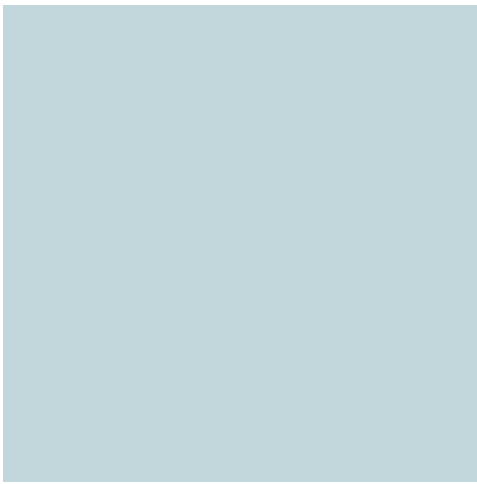


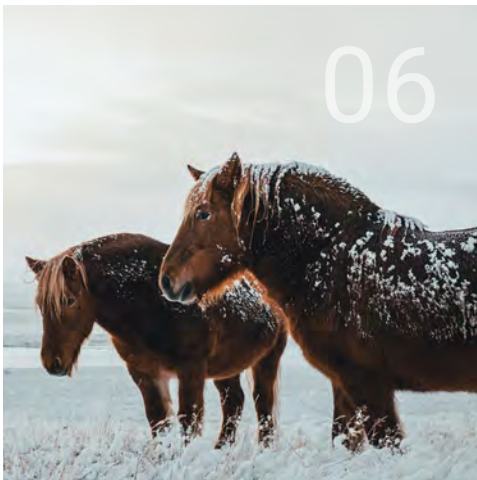
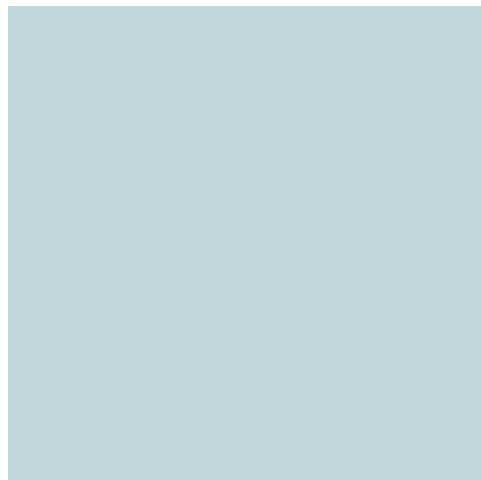
ANNUAL
REPORT

20
19





2019 was an eventful year for NeIC, bringing several new developments which have helped strengthen NeIC as an organisation and increased its Nordic impact.



CONTENTS

01 SUMMARY	4	05 EVENTS AND WORKSHOPS	29
02 PRESENTING NEIC	6	NelC2019: Nordic infrastructure	
Organisation	8	for Open Science	31
03 STRATEGY	9	All-hands Meeting 2019	31
NelC Strategy 2020-2025	10	FAIR Data Stewardship training	31
2019 Strategy Implementation	11	CodeRefinery Workshops	32
Pool Competencies	11	3-day workshops	32
Share Resources	12	Other CodeRefinery events	
Secure Long-term Funding	12	and workshops	32
Strengthen Stakeholder Dialogue	12	Software Carpentry training workshop	32
Open Call 2019	13	06 SOCIAL RESPONSIBILITY	33
04 PROJECT UPDATES	14	Openness and Transparency	34
CodeRefinery	15	Equality and Diversity	34
Status Report 2019	15	Gender Balance Statistics	34
Deep Dive	17	Staff	35
Status Report 2019	17	Environmental Sustainability	35
Dellingr	19	07 2019 ACCOUNTS	36
Status Report 2019	19	08 ORGANISATION	40
EISCAT_3D Data Support (E3DDS)	20	NelC Organisational Chart	41
Status Report 2019	20	Staff	41
EOSC-Nordic	21	Partners	42
Status Report 2019	21	Board	42
Glenna	22	Executive Team	42
Status Report 2019	22		
iOBS	23		
Status Report 2019	23		
NICEST	24		
Status Report 2019	24		
Nordic Language Processing			
Laboratory (NLPL)	25		
Status Report 2019	25		
Nordic Tier-1 (NT1)	26		
Status Report 2019	26		
Tryggve	27		
Status Report 2019	27		

01

SUMMARY



01

2019 was an eventful year for NeIC, bringing several new developments which have helped strengthen NeIC as an organisation and increased its Nordic impact. In the following, we would like to share some of our highlights from 2019.

After years of careful planning and thought, our strategy process culminated in an updated strategy for the 2020–2025 period. Our new strategy puts emphasis on four elements that will be our focus for the next six years:

1. To ensure that all our collaborations are as beneficial as possible to all partners involved.
2. To focus on people as the core of NeIC.
We recognise what a great asset the NeIC staff is, and will focus on ensuring that we engage and maintain highly skilled and motivated people.
3. To ensure that our influence in the Nordic region is geared towards improving and advancing e-infrastructure for research and for society.
4. To ensure that our processes are effective and conducive to support well-functioning collaborations.

2019 also saw the launch of the new EOSC-Nordic project, aimed at facilitating coordination of relevant European Open Science Cloud (EOSC) initiatives within the Nordic and Baltic countries and exploiting synergies to achieve greater harmonisation of policy and service provisioning. The project seeks to establish the Nordic and Baltic countries as frontrunners in the take-up of the

EOSC concept, principles and approach. EOSC-Nordic is funded under the EU framework programme Horizon 2020 and coordinated by NeIC on behalf of a strong consortium of 24 partners across Europe.

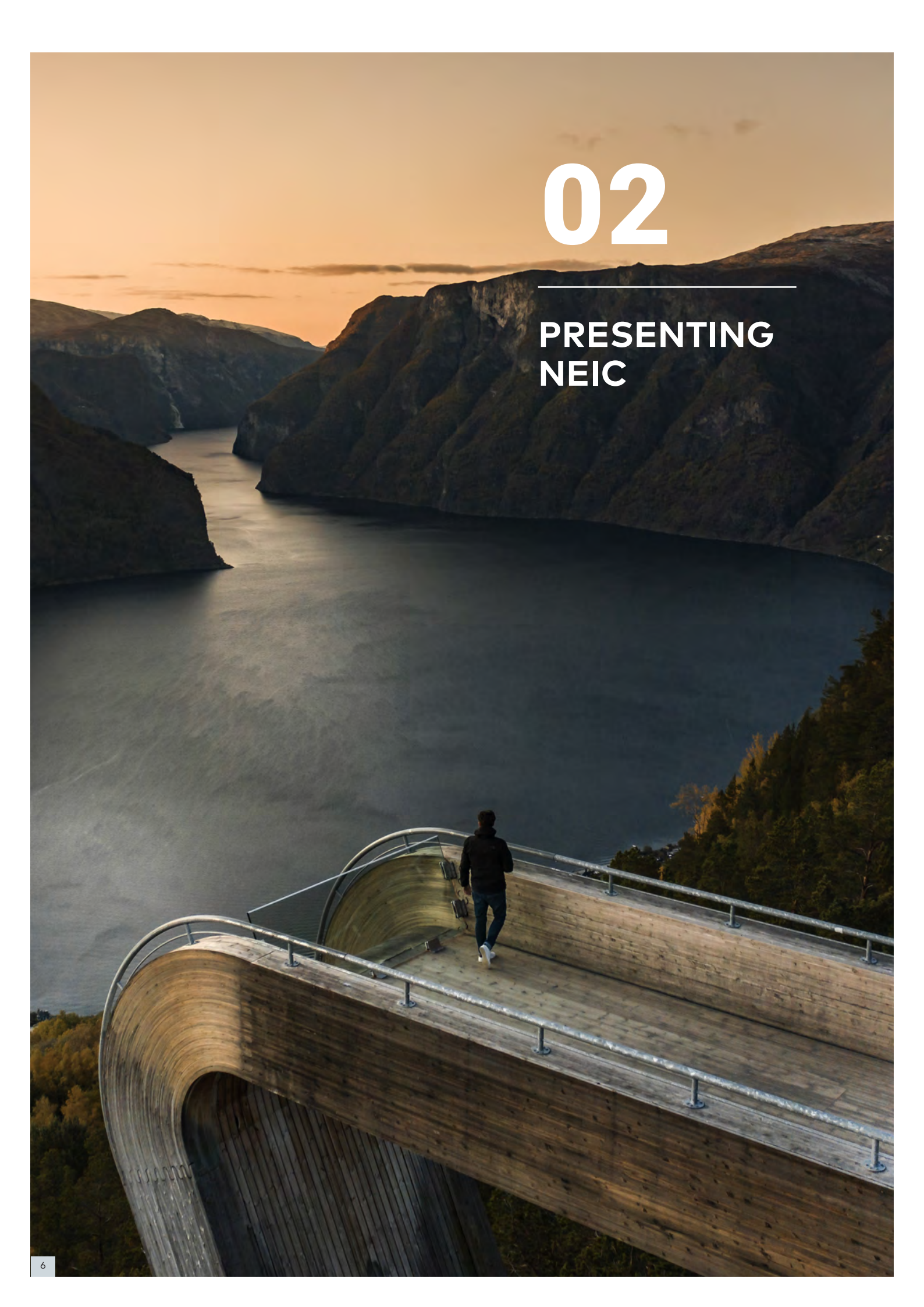
We were very excited to include a new country as a member of NeIC. NeIC has enjoyed several years of fruitful collaboration with Estonia, and we are now delighted to welcome them as a new member country and as a member of the NeIC Board. Estonia is bringing highly relevant knowledge and experience to the table. We are confident this will benefit the Nordic region, and we are excited about what this will bring to NeIC in the time to come.

Sharing knowledge and experience with others is something we value at NeIC. During 2019 NeIC project staff trained more than 650 people on topics as varied as FAIR data stewardship, project management, research software development tools and practices, and e-infrastructure tools related to topics such as earth system modelling and biodiversity. We hope this will contribute to better use of e-infrastructure across the Nordic region.

Although we are thrilled about these new developments, most of all we celebrate the everyday, ongoing efforts of all our projects and the work being carried out to advance the e-infrastructure field in the Nordic region. You can read more about what each of the projects has worked on and achieved in 2019 throughout this report. We hope you will enjoy the read.

Gudmund Høst, Director, NeIC

Kine Bugge Halvorsen, Senior Advisor, NeIC

A wide-angle photograph of a fjord at sunset. The sky is a warm orange, and the water reflects the light. Steep, forested mountains rise from the water. In the foreground, a person is walking away from the camera on a curved wooden walkway with metal railings. The walkway is built into the side of a steep, wooded hill.

02

PRESENTING NEIC

02

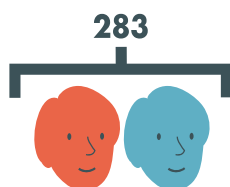
In 2019 we:



Worked with 52 partners across
the Nordics and beyond



Coordinated 11 projects



Involving 283 members of staff
(103 of these being from EOSC-Nordic)

NeIC is hosted by NordForsk, which provides for and facilitates cooperation on research and research infrastructure across the Nordic region. NeIC is NordForsk's main tool for implementing the Nordic eScience Action Plan 2.0. NeIC has two major roles. The first role is to assume operational responsibility for the Nordic distributed Tier-1 facility (part of the Worldwide LHC Computing Grid, or WLCG) that provides computing and storage for

CERN and is used by high energy physicists worldwide. The second is to collaboratively explore, evaluate, develop and deploy innovative infrastructure services in response to the strategic priorities in the area of e-infrastructure and the needs of the national e-infrastructure providers and their users.

As a result of our activities, Nordic researchers have more open avenues for resources, advanced support, collaborations and scientific advancement.

The core activities of NeIC include:

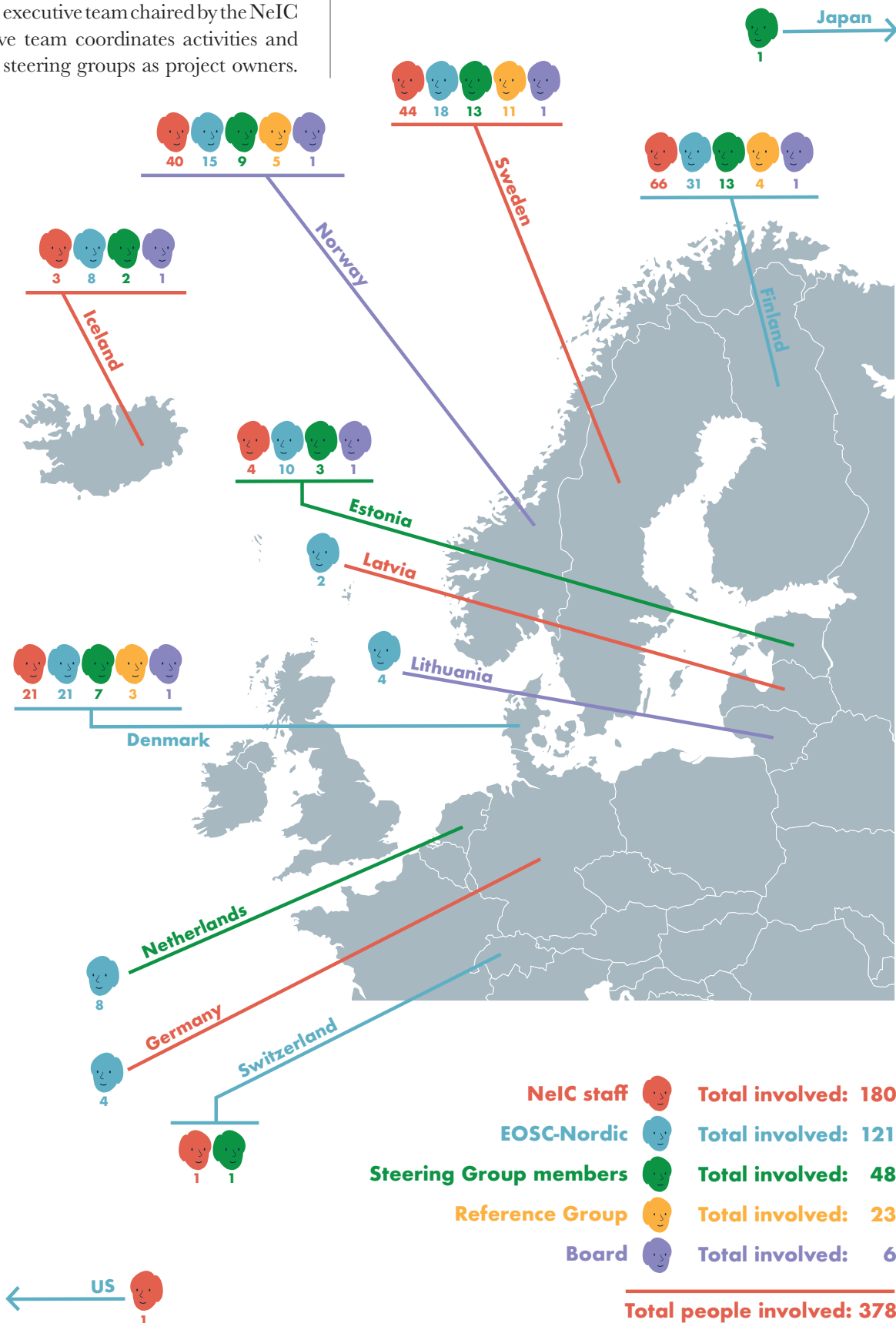
- Operating a high-quality and sustainable Nordic Tier-1 Service within the WLCG.
- Developing services for the shared use of sensitive data across the Nordic countries.
- Developing a Nordic federated cloud service driven by the needs of the Nordic researchers.
- Supporting researchers in accessing a range of computational resources within the Nordic countries by improving resource utilisation and user access to a wider range of national systems.
- Establishing software development e-infrastructure coupled with necessary technical expertise and extensive training activities to address the growing needs of the computational communities.
- Proposing e-infrastructure solutions for the EISCAT_3D next generation radar system.
- Engaging with communities to elicit opportunities for new collaborations on common computing or data services.
- Coordinating the EOSC-Nordic project, which is an EU-funded project worth EUR 6 million. The project aims to advance EOSC at the Nordic level by coordinating the EOSC-relevant initiatives taking place in the Nordic and Baltic region.

ORGANISATION

NordForsk appoints the NeIC Board based on nominations by the national e-infrastructure provider organisations. These strategic partner organisations are CSC (Finland), SNIC (Sweden), UNINETT Sigma2 (Norway), DeiC (Denmark), RHnet (Iceland) and ETAIS (Estonia). The NeIC Board consists of one representative from each partner organisation (ETAIS became a member December 2019).

NeIC is managed by an executive team chaired by the NeIC Director. The executive team coordinates activities and participates in project steering groups as project owners.

NeIC is at the crossroads between national, Nordic and international strategies. NeIC has worked to increase collaboration through a set of projects that include the national providers (CSC, DeiC, RHnet, SNIC, UNINETT Sigma2 and ETAIS), partners in ESFRI projects, and other institutions in the Nordic region and Europe. NeIC projects are in place in the areas of Physics and Engineering Sciences, Environmental Sciences, Humanities, Culture and Society, Life Science and e-Sciences.



03

STRATEGY

03

NEIC STRATEGY 2020-2025

The strategy process culminated in an updated strategy for the 2020–2025 period. The revised strategy builds on the 2016–2020 strategy, recognising NeIC as a Nordic organisation dedicated to working with a wide range of Nordic partners to produce, enhance and support research e-infrastructure in the region.

The vision for NeIC is to be a global role model for cross-border distributed and sustainable e-infrastructure collaborations. NeIC activities will centre on digital infrastructure for Nordic research excellence.

There are four strategic objectives in the NeIC 2020–2025 strategy:

- Beneficial collaborations are the principal way that NeIC brings together the needs, interests and resources to create e-infrastructure to support research excellence in the Nordic region.
- Nordic influence is the effect that NeIC has in improving and advancing e-infrastructure for researchers and for society.
- Motivated people bring the results into the research domains and society and are essential in the collaborations.
- Effective processes bind NeIC into an organisation that is able to realise the benefits and influences of the collaborations.

The **beneficial collaborations** strategic objective has three development areas:

Benefits realisation. Successful projects have outcomes that can be realised as benefits by stakeholders.

Partner engagement. We will enhance interaction with partners through more targeted engagement with a broader group of partners.

Implementer of collaboration models. Emerging collaboration opportunities will include partners that we have not yet worked with.

The **Nordic influence** strategic objective has three development areas:

Nordic added value. As a Nordic organisation, NeIC must focus on the added value to the region that comes from NeIC projects in support of digital infrastructure for Nordic research excellence. This will include the strategic priority for Society, Ethics and Sustainability as it relates to NeIC.

Global role model. NeIC has the opportunity to be recognised as a global role model for collaborations on regional e-infrastructure, (e.g. the EOSC-Nordic project).

New funding partnerships. NeIC will extend and enhance existing partnerships that complement the national providers and other e-infrastructure developers in a number of domains and topics.

The **motivated people** strategic objective has three development areas:

Development opportunities. NeIC provides opportunities to develop skills and new knowledge for its staff, e-infrastructure providers and researchers in the Nordic region. The opportunities to improve their skills should benefit them, their home institution and the region.

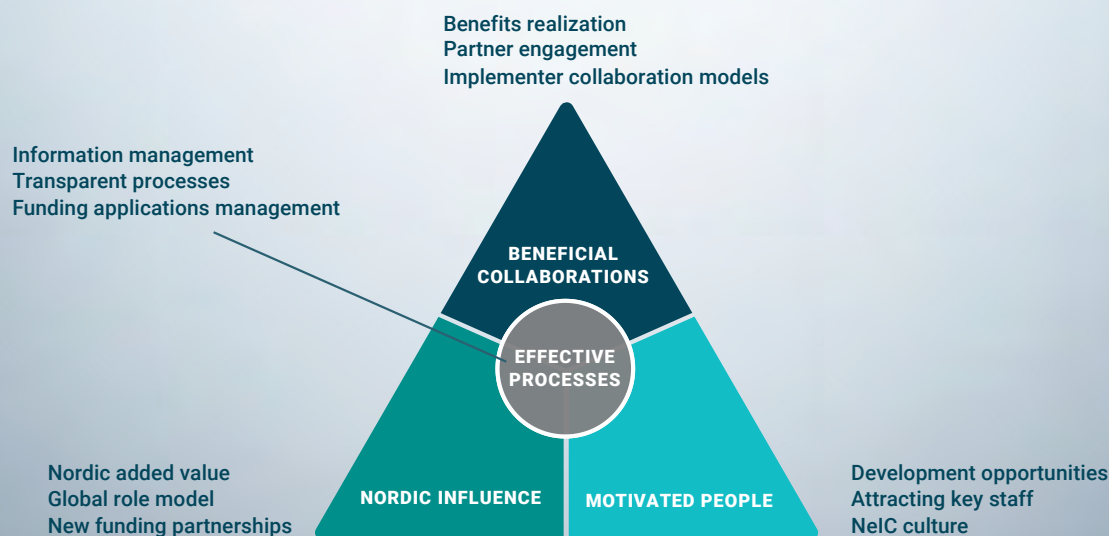
Attracting key staff. Finding people with the skills and interest to work on Nordic projects that complement their national areas of specialty requires presenting the right opportunities in the most appropriate channels.

NeIC culture. Understanding how the values of openness and collaboration contribute to the added value of Nordic projects and the people working on the projects is an important area for NeIC to be aware of and provide in the training of new project members.

NEIC STRATEGY 2020-2025

NeIC is a global role model for cross-border distributed and sustainable e-infrastructure collaborations

MANTRA: NORDIC INFRASTRUCTURE FOR RESEARCH EXCELLENCE



The **effective processes** strategic objective has three development areas:

Information management. Gathering and providing the information about what NeIC is doing and communicating it well is increasingly important to NeIC's effectiveness in the Nordic region.

Transparent processes. NeIC operates on trust between the collaborators. This entails providing accurate information that is timely and on-point for what is needed. The processes must work well and be accepted by the people who rely on them.

Funding applications management. The process for funding applications includes gathering information from across NeIC and its partners, and incorporating it into a form that is suitable for each of the different funding agencies.

2019 STRATEGY IMPLEMENTATION

The following provides an overview of our strategy implementation in 2019 for each of our four focus areas. The milestones are separated into indicators (executed tasks) and effects (the impact resulting from these tasks).

POOL COMPETENCIES

During 2019, the Pool Competencies focus area was tasked with these points:

- Report on skills for the Nordic e-infrastructure community
- Report on training programme
- Event management service in production
- KPIs for HR policy implementation
- A common Nordic activity on data management

The 2019 indicators and effects from the Pool Competencies area are provided below.

Indicators: Nine CodeRefinery 3-day workshops were held in 2019. In addition, CodeRefinery organised a hackathon, instructor training and other workshops. The event management system was taken into production and the report on the training programme was published. In addition to this, FAIR data stewardship courses were held in Oslo and Copenhagen. Also, a [prototype for a knowledge map](#) was conceived, discussed and demoed.

Effects: Because of the above mentioned training activities;

- More than 200 participants were trained in 2019 in CodeRefinery 3-day workshops.
- 30 persons received instructor training.
- 14 new trainers in the Nordic region were certified as Carpentries instructors.
- 24 participants were trained in essential basic computing skills.
- 67 participants were trained in FAIR data stewardship.

SHARE RESOURCES

During 2019, the Share Resources focus area was tasked with these points:

- A framework agreement with national providers
- Policies and technologies for AAI
- Federated accounting system
- Mechanism to disseminate information on services
- Report on the use of service offerings

The 2019 indicators and effects of the Share Resources area are provided below.

Indicators: During 2019 a cross-border resource sharing allocation mechanism was tested through the Dellinger project. Also, collaboration on resource sharing between projects Dellinger, Glenna2 and Tryggve2 resulted in a joint pilot and the implementation of a resource exchange technical solution across borders (Waldur). Glenna2's collaboration with Nordic meteorological offices was strengthened through the iOBS project. Lastly, pioneering work on interoperable distributed data archive for human data (Federated EGA) was acknowledged by ELIXIR.

Effects: Waldur (Estonia) implemented partially in Denmark, Finland and Iceland. NeIC services were scrutinised in order to list the ones that are compatible with EOSC requirements and are ready to go live.

SECURE LONG-TERM FUNDING

During 2019, the Secure Long-term Funding focus area was tasked with these points:

- Application/request for Finland, Denmark, Iceland and Sweden long-term funding authority at agreed level
- Application/request for long-term funding to NordForsk at agreed level
- Mapping and concepts for other partner funding
- Define process and prepare and manage funding proposals
- Strategy update in consultation with stakeholders

The 2019 indicators and effects of the Secure Long-term Funding area are provided below.

Indicators: The funding environment with the current NeIC partners is good and provides a reasonable level

of confidence in funding for NeIC with the four largest partners. An additional indicator of the financial viability of NeIC is that Estonia was welcomed as a new member of NeIC December 2019. Additional indicators of satisfactory progress were a dialogue meeting with the Swedish Research Council, the submission of an annual report to the Research Council of Norway, and the funding award for the EOSC-Nordic project. The adoption of the Policy on Externally Funded Projects provides scaffolding for exploration of additional new funding arrangements and these are being proposed in the 2020 strategy implementation plan. The NeIC 2020–2025 Strategy was adopted by the NeIC board for implementation beginning in 2020.

Effects: As a result of demonstrated value of NeIC, the collaboration extended to include Estonia as a full member, the EOSC-Nordic project has launched as a separately funded activity, and the 2019 open call for collaborations drew a set of high quality responses that will provide benefits and Nordic added value as exemplars for upcoming funding applications.

STRENGTHEN STAKEHOLDER DIALOGUE

During 2019, the Strengthen Stakeholder Dialogue focus area was tasked with these points:

- Engagement activities monitored
- Open call for proposals
- Meetings with potential partners to explore synergies
- Propose communication plan
- Meetings with international stakeholders to present NeIC
- Presentations at international meetings

The 2019 indicators and effects of the Strengthen Stakeholder Dialogue area are provided below.

Indicators: Dialogue meetings were offered to all NeIC partners, and held with Swedish, Norwegian, Danish, Finnish and Estonian national providers. Two open calls were launched; the Call for Development Projects and Call for Prestudies which received 5 and 2 responses, respectively. The NeIC2019 conference held in Copenhagen 14–16 May brought together 155 participants from across the Nordic region and beyond.

Effects: NeIC coordinated a proposal on behalf of 24 partners from both within and outside the Nordic region for the EOSC-Nordic project to the European Commission.

The proposal was successful and was awarded EUR 6 million in funding. NeIC is the coordinator of EOSC-Nordic. Also, the Estonian Research Council submitted a formal application to join NeIC. Lastly, a pre-study proposal on Nordic Digital Humanities Library was awarded funding from NeIC.

OPEN CALL 2019

NeIC launched two open calls during 2019, inviting consortia consisting of e-infrastructure providers, developers, researchers and related communities around the Nordic region to propose e-infrastructure collaboration projects of joint Nordic interest.

Our call for proposals for development projects was aimed at developing services for a wide range of research problems and the typical project team consists of service providers.

As a result of this call, NeIC entered into negotiations with two new projects; Puhuri and NICEST2. Puhuri will work to enable seamless cross-border service access for Nordic scientists. The first focus is Nordic access to the LUMI large-scale HPC system resources. NICEST2 is a continuation of NeIC's collaboration project on Earth System Modelling Tools.

NeIC also launched a call for proposals for pre-studies. The pre-study aims at Nordic teams-in-formation to explore synergies of common e-infrastructure solutions and the potential to scope a future development project. A pre-study proposal on a Nordic Digital Humanities Library (NDHL) will be explored as a result of this open call. NDHL is coordinated by the Centre for Humanities Computing, Aarhus University, and includes nine partners from Denmark, Finland, Sweden and Norway.



A large brown bear stands in a forest clearing, looking directly at the camera. The bear is positioned in the lower right quadrant of the frame. The background is a dense forest of tall, thin trees, mostly evergreens, with some deciduous trees showing autumn foliage. The lighting is soft and natural, suggesting a late afternoon or early morning setting. The overall tone is calm and majestic.

04

PROJECT UPDATES

04

CODEREFINERY

The goal of the CodeRefinery project is to teach students and researchers how to write better code and provide research groups with software development e-infrastructure tools to collaboratively develop, review, discuss, test, and share their code. The training addresses students and researchers within all academic disciplines who already write code. The project also provides infrastructure for collaborative source code repository hosting. The project is in phase 2 which will run until the autumn of 2021. Phase 2 of the CodeRefinery project has four goals:

- to build a community of research software engineers;
- to establish sustainability of the project, workshops, and services, beyond phase 2 of the project;
- to better incorporate social sciences and humanities and data management into the lesson material;
- to increase openness and transparency with an open chat and public progress tracking.

STATUS REPORT 2019

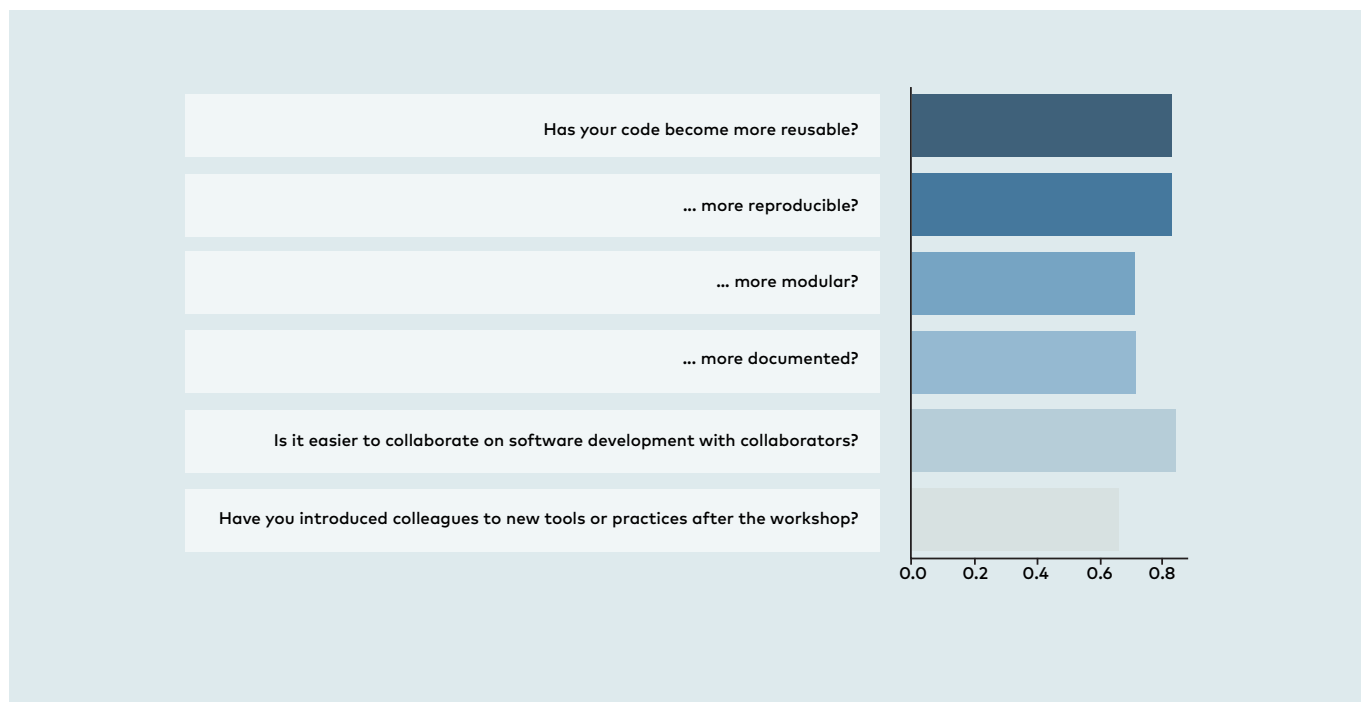
Indicators: 2019 was a busy year for CodeRefinery, with a calendar filled with a total of 16 workshops and training courses aimed at teaching researchers in software development tools and practices. These workshops were held across all the Nordic countries, Estonia, and also France. Additionally, CodeRefinery organised a hackathon with the aim of building a Nordic community of research software engineers.

The CodeRefinery project and its goals were discussed in a Nature Physics comment “A FAIRer future”¹ which included thoughts about software openness and FAIRness, code review, software citation, and credit.

Effects: Over 300 students and researchers were trained by CodeRefinery in 2019. The long-term impact of CodeRefinery workshops is measured through a post-workshop survey which is sent out to all former participants 3-6 months after attending a workshop.

¹ <https://doi.org/10.1038/s41567-019-0624-3>

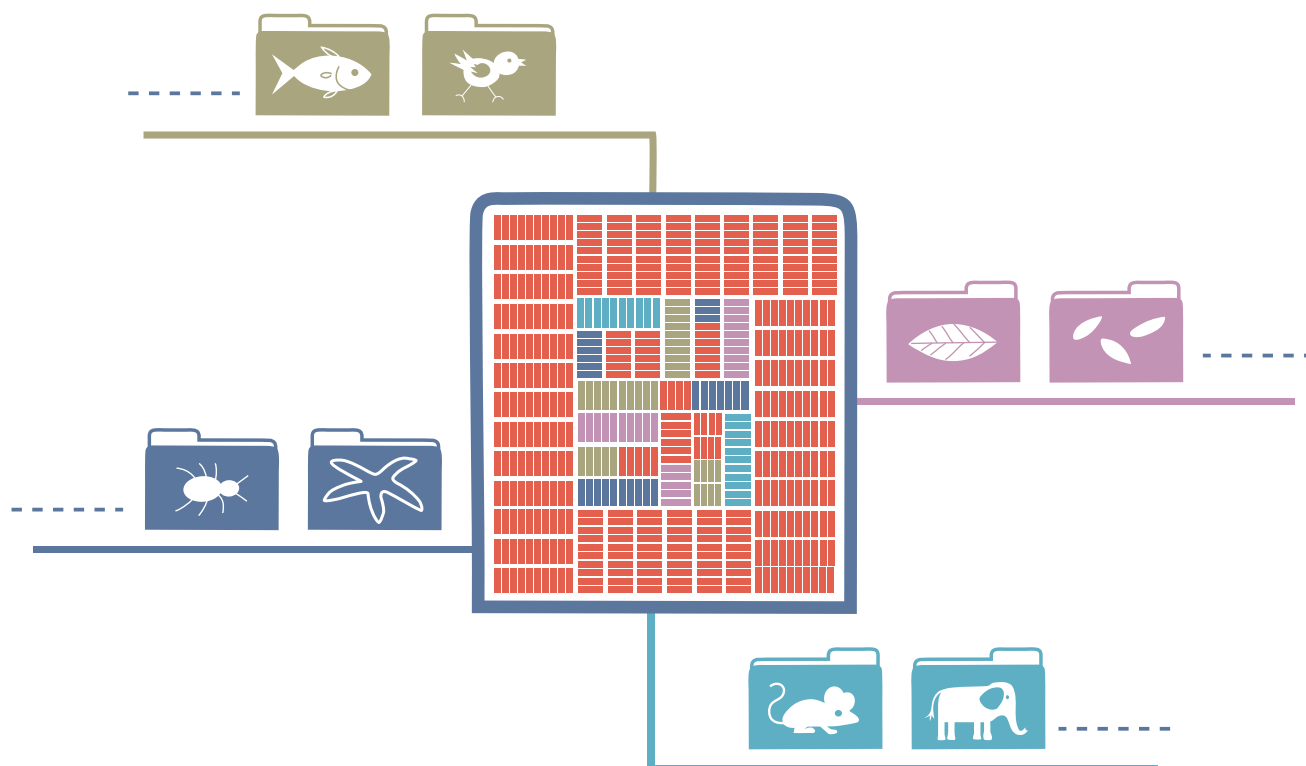




The survey studies how former participants use software development tools after attending a workshop, and how their code and collaboration with colleagues has changed. The survey results reveal that workshop participants start using or use tools in a better way after attending CodeRefinery workshops. In fact, 80% say that their code is 1) more reusable 2) more reproducible and 3) that it is easier to collaborate on software development after attending a CodeRefinery workshop. More details on the

survey results can be found here: <http://coderefinery.org/>. The data can be accessed at <https://github.com/coderefinery/post-workshop-survey>.

In addition to courses on sustainable software development, CodeRefinery held its first instructor training workshop in Stockholm with 30 participants to train future instructors and grow the community.



DEEP DIVE

The vision for the Nordic-Baltic Collaboration on e-Infrastructures for Biodiversity Informatics (DeepDive) was to develop a distributed, user-driven and service-oriented regional e-infrastructure. The individual countries host their national e-infrastructure components and data, but collaborate to provide consistent regional services, tools, virtual laboratories and education. The aim was to enhance the Nordic-Baltic collaboration within biodiversity informatics to coordinate common efforts, reduce redundant investments and efforts and increase the regional scientific achievements and global competitiveness. This will in turn provide educational support for e-Science and strengthen the Nordic-Baltic science policy interface. The DeepDive project was concluded 31 December 2019.

STATUS REPORT 2019

Indicators: DeepDive organised eight Nordic training events on topics including handling spatial data in R, access to biodiversity data through web services, machine learning in applications of biodiversity informatics, collection data management, SuperSmartR, Python for biologists and Artificial Intelligence. In addition, the project organised two technical workshops on the following topics: Machine Learning and Atlas Technology.

DeepDive has published five conference papers during a final dissemination event:

- Deep Relations in the Nordic and Baltic Biodiversity e-infrastructures;²
- Linked Open Data for Taxonomic Databases: the Nordic/Baltic Implementation;³
- Establishing Taxon Links Between the Nordic/Baltic Countries via Linked Open Data;⁴
- Linked Data Tools for Managing Taxonomic Databases;⁵
- PlutoF: Biodiversity data management platform for the complete data lifecycle.⁶

The project also produced two manuscripts to be published during 2020, including a high-level policy paper to the European Commission (called Future Science Brief⁷), and a peer-reviewed article describing the Nordic Linked Open Data system⁸.

2 <https://biss.pensoft.net/article/37343/>

3 <https://biss.pensoft.net/article/37332/>

4 <https://biss.pensoft.net/article/37428/>

5 <https://biss.pensoft.net/article/37329/>

6 <https://biss.pensoft.net/article/37398/>

7 https://www.bonusportal.org/news/save_the_date!_7th_emb_forum_big_data_in_marine_science_29_april_2020_brussels.4225.news

8 Lahti T, et al (2020) Linked Data Tools for Managing Taxonomic Databases. Biodiversity Data Journal. In prep.

Although the DeepDive project came to an end in 2019, it was included as a use case in the successful EOSC-Nordic proposal (2019- 2022), contributing to the sustainability of the project results and outcomes after the NeIC funding period.

Effects: Overall 148 participants from across the Nordic region have been trained by DeepDive on e-infrastructure topics aimed at raising the skill set of the Nordic biodiversity community. In addition, the technical workshops were attended by more than 45 participants from Nordic countries.

DeepDive played a role in enhancing 20 national services and technology platforms on biodiversity and ecology research (on topics such as taxonomy, monitoring, databases, catalogues etc.) by linking these across the Nordic region.

DeepDive supported four use cases in the fields of Machine Learning, Virtual Research Environments, Linked Open Data and Atlas Technology.

Additionally, DeepDive supplied data to European/global data infrastructures and networks for biodiversity and ecosystem research, including GEO BON, GBIF, EmodNet and DiSSCo.





DELLINGR

The approach of the Delligr project is to work with national e-infrastructure providers to define a functional framework for High-Performance Computing resource sharing. The framework recognises and builds upon the unique strengths of each provider to advance research in each of the respective countries as well as within the Nordic region. The Delligr project is working to create the appropriate mechanisms for researchers to cross national boundaries for access to the full range of computing environments, and for national e-infrastructure providers to share competencies and capabilities. This should help national researchers to have access to the newest systems in other countries, as they come online in the future.

STATUS REPORT 2019

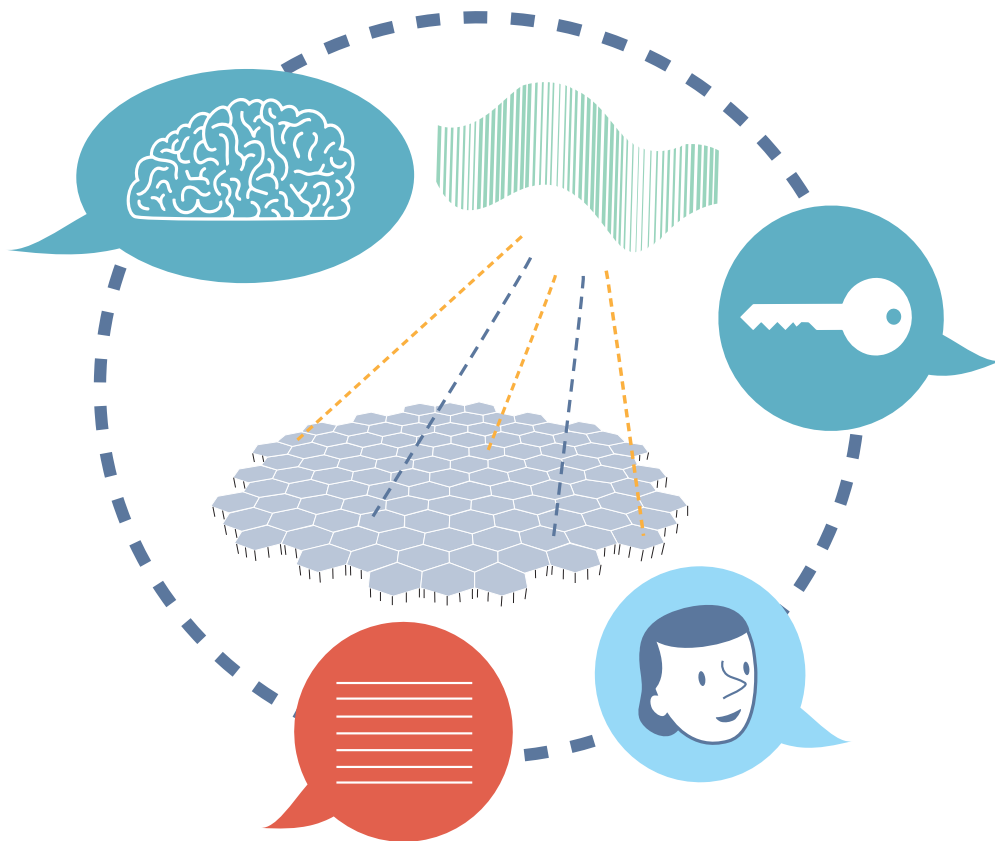
Indicators: During 2019 Delligr wrote several deliverables to be used as a basis for further discussions on HPC resource sharing in the Nordic region:

- a deliverable giving an overview of the national HPC and Cloud resources available in each of the countries participating in Delligr;
- a deliverable describing the work necessary to share computing resources across borders;
- a deliverable describing the preconditions and limitations for sharing resources from a policy, legal, and practical standpoint;
- a deliverable focused on user authentication, authorisation and accounting.

Effects: A test of the cross-border resource sharing framework was officially launched, and the users were served through the cross-border resource-sharing service. In total 10 users were given access to Nordic HPC resources in Delligr's second test of a cross-border resource-sharing framework.

The impact of deploying this resource sharing framework went beyond the primary function to test resource sharing by registering and matching users and resources. The framework as deployed to Delligr was seen to be useful for registering resources in compliance with the EOSC service description template. This will reduce future efforts in relation to participation in EU-funded e-infrastructure projects. In terms of sustainability, the outcomes of Delligr contributed to EOSC-Nordic, especially to work packages dedicated to policies, legal issues and sustainability, and support to EOSC-Nordic service providers. The Puhuri project, to start in 2020, will work further on certain aspects of resource sharing for the LUMI large scale HPC system.

So far in 2019, seven publications have credited the first Delligr resource sharing pilot for usage of computing resources. This impact was not a primary goal of the first pilot.



EISCAT_3D DATA SUPPORT (E3DDS)

EISCAT_3D is an environmental research infrastructure on the European ESFRI (European Strategy Forum on Research Infrastructures) roadmap. It is proposed as an international research infrastructure using the incoherent scatter technique to study the upper atmosphere above the Arctic in order to investigate how the Earth's atmosphere is coupled to the solar-magnetosphere. The E3DDS project will design, simulate and prototype the data flow and computing workflow from the antenna arrays of the upcoming EISCAT_3D radar sites to the central storage and computing site. The project will produce a set of requirements for the amount and type of resources needed for the EISCAT_3D site and online computing. In addition, E3DDS explores the possibilities for EISCAT_3D computing to be handled by national providers of e-infrastructure through collaborations such as NT1.

STATUS REPORT 2019

Indicators: Plans for a novel, radical, high-performance, wide-area network connecting the remote EISCAT_3D sites was presented at a meeting with the E3DDS stakeholders. Following this, EISCAT is considering a full-fibre data transfer option, i.e. data from FSRUs (approximately 220 x 25Gb/s) streamed directly to a central computing location. If adopted, this could lead to savings in personnel and operating costs.

Effects: The E3DDS project has conducted several activities advising EISCAT on on-site computing software and hardware architectures for EISCAT_3D. In addition, EISCAT accepted plans for a test cluster to be installed at a national provider centre.

The computing and network designs aided by the E3DDS project will maximise performance and ideally reduce the operating costs while respecting the EISCAT design criteria.



EOSC-NORDIC

EOSC-Nordic will facilitate the coordination of relevant EOSC (European Open Science Cloud) initiatives within the Nordic and Baltic countries and exploit synergies to achieve greater harmonisation of policy and service provisioning across these countries, in compliance with EOSC agreed standards and practices. The project seeks to establish the Nordic and Baltic countries as frontrunners in the take-up of the EOSC concept, principles and approach. EOSC-Nordic is coordinated by NeIC and brings together a strong consortium of 24 partners including e-infrastructure providers, research-performing organisations and expert networks.

The project is funded under the EU framework programme Horizon 2020.

STATUS REPORT 2019

Indicators: The EOSC-Nordic project was launched on 1 September 2019 and will run for 3 years. The kick-off meeting was held in Espoo 2-3 September with over 120 participants from across Europe. EOSC-Nordic also launched its website⁹ where people can connect with the project and stay up-to-date on news and events.

A webinar was held between EOSC-Nordic specialists and Nordic and Baltic members of the EOSC Executive

Board working groups. The webinar covered national initiatives and infrastructures of EOSC relevance, FAIR practices in the Nordic countries, and updates from the working groups. A recording of the webinar is available on the EOSC-Nordic website.

A mapping exercise of national services in the Nordic and Baltic countries was conducted. The National Initiatives survey was conducted with the goal of mapping and analysing national and thematic initiatives on open research data policies and identifying services that may contribute to the implementation of the European Open Science Cloud. The results of this survey will be presented to decision makers within the EOSC.

A policy meeting was held between EOSC-Nordic representatives and Nordic and Baltic e-IRG delegates in Helsinki. The purpose of the event was to provide an update on EOSC developments in the Nordic countries and to discuss barriers for open science.

EOSC-Nordic represented the project in an international context and held presentations at a total of 15 events across Europe, including Amsterdam, Prague, Copenhagen, Oslo, Tallinn, Stockholm, Brussels, Porto, Helsinki, Budapest and more.

9 <https://www.eosc-nordic.eu/>



GLENNNA

The aim of Glenna is to create a Nordic federated cloud service, driven by the needs of Nordic researchers. Glenna2 builds on the work and successes of the initial Glenna project (2014–2016), and focuses on supporting Nordic national cloud initiatives to sustain affordable IaaS cloud resources, establishing an internationally leading collaboration on data-intensive computing and assessing future hybrid cloud technology. The project additionally aims at pooling national cloud application expert support in order to establish a Nordic support channel for cloud and big data. An immediate benefit of Glenna2 is that the project provides an environment that allows rapid time to market for scientific software and a flexible set of resources for both developing and delivering software as service.

STATUS REPORT 2019

Indicators: Three articles were published in scientific magazines. PhenoMeNal: Processing and analysis of Metabolomics data in the Cloud¹⁰ was published in GigaScience. Interoperable and scalable data analysis with microservices: Applications in Metabolomics¹¹ was published in Bioinformatics. KubeNow: an On-Demand

Cloud-Agnostic Platform for Microservices-Based Research Environments¹² was published in PeerJ Computer Science¹³. In addition to these Glenna also released technical reports on Bare Metal provisioning and KubeFlow evaluation and delivered a working KubeFlow environment deployed and demonstrated over a virtual Kubernetes cluster.

Effects: New project targets were added on “Stream Processing technologies” as well as “Evaluating infrastructure and platforms for artificial intelligence/machine learning”. The latter is now supporting three new use cases. In 2019 Glenna provided support to the DeepDive project in establishing a Nordic platform which will include machine learning capabilities. It also investigated stream processing technologies with the aim of supporting iOBS with computing on data directly as it is produced or received, negating the need for permanent storage in a database. Lastly, it supported Uppsala University & Scaleout Systems AB with the Lean AI stack, the first NeIC-funded open source machine learning framework.¹⁴ The purpose of the stack is to provide a highly flexible, cloud-native open toolkit for full-stack data science projects.

¹⁰ <https://academic.oup.com/gigascience/article/8/2/giy149/5232984>

¹¹ <https://academic.oup.com/bioinformatics/article/35/19/3752/5372675>

¹² <https://doi.org/10.7717/peerj-cs.232>

¹³ <https://arxiv.org/abs/1808.02318>

¹⁴ <https://github.com/leanaiorg/leanaistack>

iOBS

The purpose of the iOBS project (Improved Observation Usage in Numerical Weather Prediction) is to provide software tools for MetCoOp, the ongoing cooperation between the national meteorological institutes of Finland, Norway, Sweden and Estonia (joined as of January 2020). The institutes have decided to pool their High-Performance Computing resources by running one common weather forecast model. By 2027, MetCoOp will include 10 national meteorological institutes.

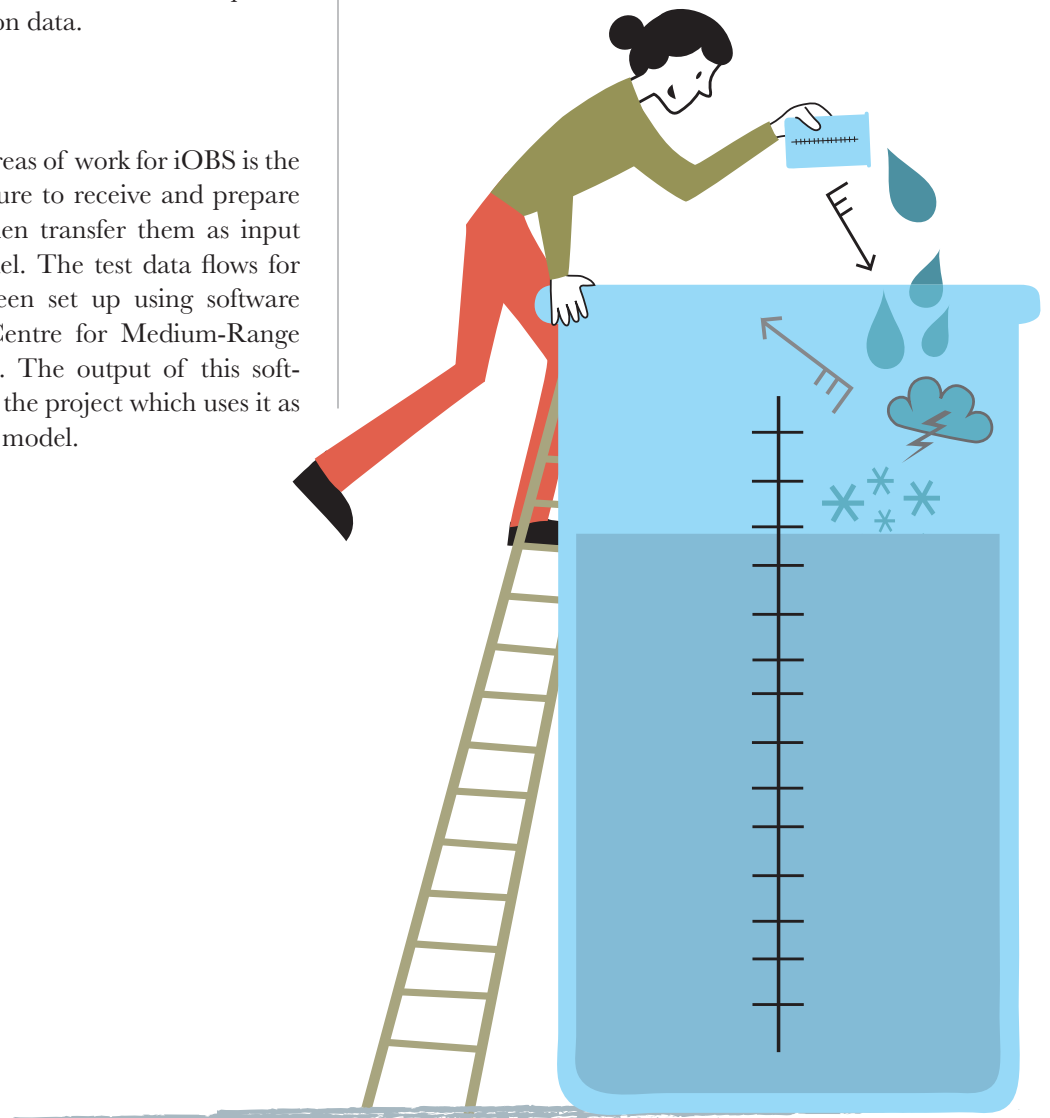
The weather prediction model needs weather observation data as input. It is important to plan and test unified data flows in order to receive and process the weather observations from all the future partners, as well as crowd-sourced data from private citizens. The iOBS project is developing open software and testing available solutions to prepare for the future massive amounts of both public and private weather observation data.

STATUS REPORT 2019

Indicators: One of the key areas of work for iOBS is the set-up of a test IT infrastructure to receive and prepare weather observations data, then transfer them as input to a customised weather model. The test data flows for weather observations have been set up using software provided by the European Centre for Medium-Range Weather Forecasts (ECMWF). The output of this software is sent to another part of the project which uses it as input to a customised weather model.

Effects: The weather forecast model can now for the first time accept input from private weather stations as a proof-of-concept.

Also, iOBS created the first complete list of all (both existing and emerging) observational data of use within weather forecasting available within SMHI, FMI and MET Norway. This is important because it allows prioritization of what data to assimilate first in order to further improve numerical weather forecasts.





NICEST

The Nordic Infrastructure Collaboration on Earth System Tools (NICEST) strengthened the Nordic Earth System Modelling (ESM) community by efficiently using various e-infrastructures through competence building, as well as sharing and exchanging knowledge. The desired results were increased efficiency of ESM teams and open doors for future scientific and technical collaborations. The NICEST project came to an end 31 December 2019.

STATUS REPORT 2019

Indicators: NICEST organised two workshops and a webinar¹⁵ in 2019 on CMIP6¹⁶ data publication for climate scientists. CMIP6 is an international programme sponsored by the World Climate Research Programme. Participating in and contributing to the CMIP6 programme is seen as key for Nordic climate modelling research and for Nordic climate change policy.

Although the NICEST project came to an end in 2019, it was included as a use case in the successful EOSC-Nordic proposal (2019- 2022), contributing to the sustainability of the project results and outcomes after the NeIC funding period.

Effects: NICEST helped in operationalising the ESGF data nodes in the Nordic region. The ESGF (Earth System Grid Federation) is an international collaboration that publishes data related to global climate change research. The data published by ESGF nodes is used for assessments by the Intergovernmental Panel on Climate Change (IPCC). Also, thousands of researchers from all over the world download data from ESGF nodes for their research. In 2019 NICEST established a Nordic-level collaboration of ESGF node admins. Four ESGF data nodes in Nordic countries were established at NSC, DMI, CSC, and Sigma2. The first CMIP6 data generated by Nordic research groups were published in June this year. Additional data generated by Nordic institutes (SMHI, Met, DMI, FMI, University of Helsinki, Bolin Centre, Lund University) will be published on these data nodes as the groups complete more simulations and quality control of the output data. Thanks to the coordinated efforts of the NICEST project, some Nordic ESGF nodes are now considered very stable and are drawing the attention of other EU countries who are willing to host their data through Nordic nodes, e.g. NSC.

15 <https://drive.google.com/drive/folders/1u4Dgo-QIfQDoYSX0WNShcODbjxjq-RCO8>

16 <https://www.wcrp-climate.org/wgcm-cmip/wgcm-cmip6>

NORDIC LANGUAGE PROCESSING LABORATORY (NLPL)

Natural Language Processing (NLP) is the interdisciplinary branch of Computer Science and Linguistics that enables everyday technologies and services, for example, automated translation (e.g. Google or Bing Translate), human-machine interaction in spoken language (e.g. Apple's Siri or Microsoft's Cortana), or content recommendation and contextual advertisement (e.g. on online news sites). As such, language-enabled technologies are rapidly growing in societal and commercial relevance. The aim of the NLPL was to implement a Nordic virtual laboratory for Natural Language Processing. The virtual laboratory created new ways to enable data- and compute-intensive research in Natural Language Processing by sharing a uniform software and data stack in multiple Nordic HPC centres. The NLPL project came to an end 31 December 2019.

STATUS REPORT 2019

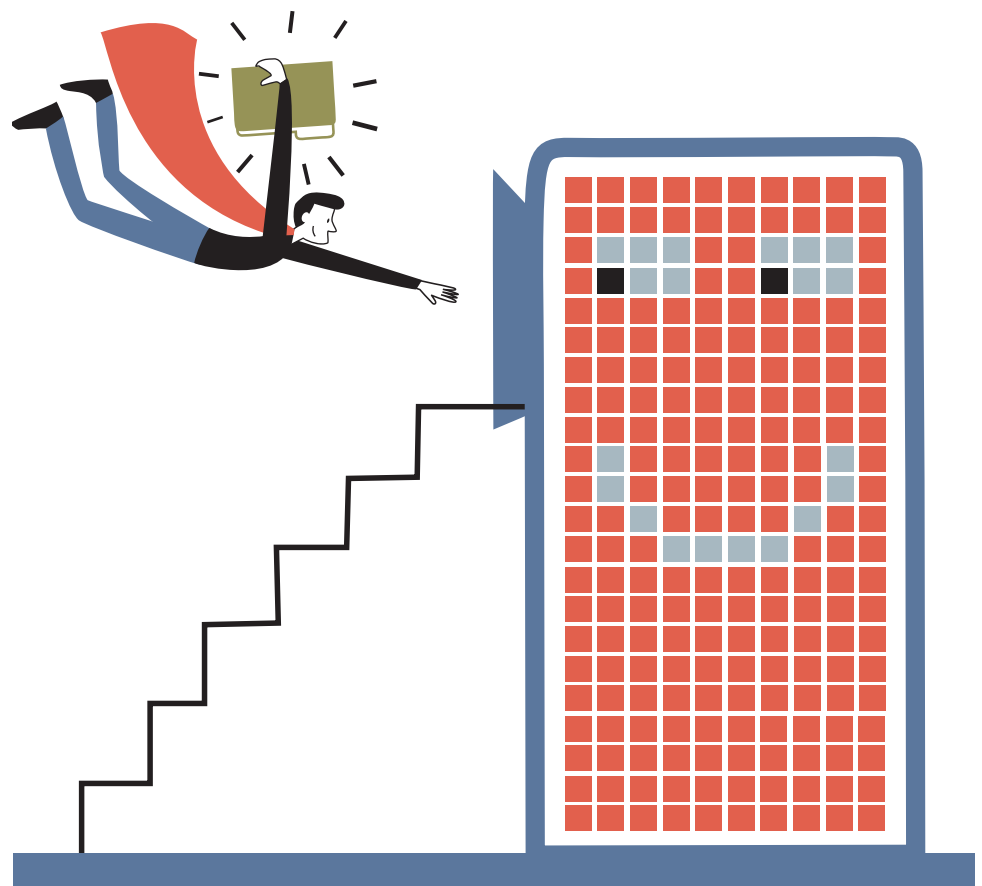
Indicators: NLPL arranged a winter school 4–6 February at Skeikampen with 45 participants, including instructors from the School of Computer

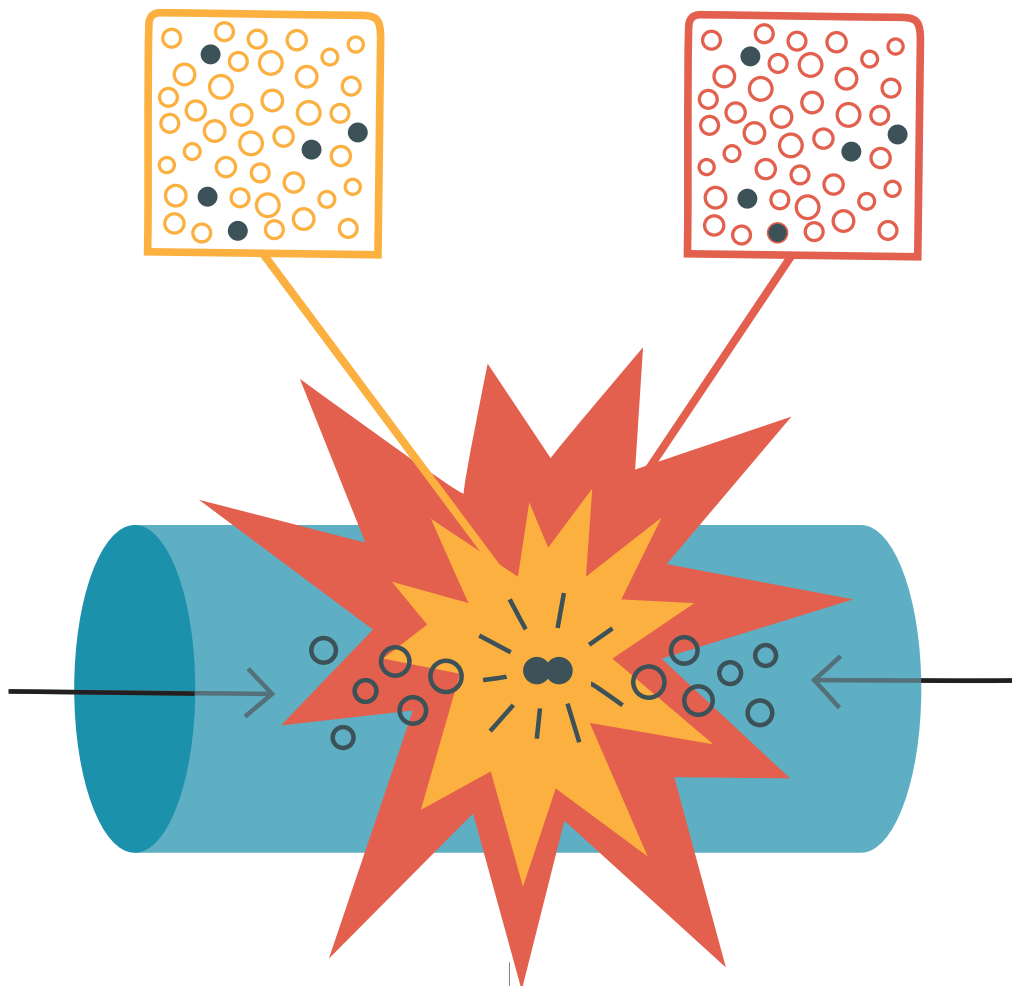
Science, Carnegie Mellon University. Participants were from Denmark, Estonia, Finland, Iceland, Norway and Sweden.

A workshop on Deep Learning with invited speakers was also organised at the NoDaLidDa 2019 conference as was a workshop on Deep Learning at the NeIC2019 conference.

NLPL was included as a use case in the EOSC-Nordic project, contributing to the sustainability of the project results after the NeIC funding period. The project will also be sustained via the NeIC affiliate programme.

Effects: The project migrated the virtual laboratories both in Norway (from Abel to Saga) and in Finland (from Taito to Puhti) and successfully concluded NLPL pilot cases on the new systems, Saga and Puhti, that have become operational in Norway and Finland, respectively.





NORDIC TIER-1 (NT1)

The Nordic Tier-1 (NT1) is one of the 13 Tier-1 regional computing centres of the Worldwide Large Hadron Collider (LHC) Computing Grid – the large international e-infrastructure built to provide computing and storage for CERN (The European Organisation for Nuclear Research). The NT1 computing centre is unique in being distributed across four countries: Denmark, Finland, Norway and Sweden. The purpose is to coordinate and run a common Nordic Tier-1 site, with funding provided both from national sources (for computing and storage resources) and from NeIC (for the infrastructure in the form of people, network and software needed to support a coherent service). The Nordic Tier-1 activity is an operating production service, which focuses, in addition, on continually improving the software and services important to the user communities served.

STATUS REPORT 2019

Indicators: NT1 started providing resources to both EISCAT_3D and IceCube based on donated and borrowed resources for the purpose of testing its services.

Effects: The NT1 enabled 240 and 543 papers by the ALICE and ATLAS experiments, respectively. The NT1 coordinator, Mattias Wadenstein, was elected co-chair of the Worldwide LHC Computing Grid Collaboration

(WLCG) Grid Deployment Board.¹⁷ NT1 reached 100% reliability for both ATLAS and ALICE during the last half of 2019 according to official CERN availability and reliability reports.¹⁸ NT1 is the only ALICE tier-1 site (out of nine) and one of three (out of twelve) ATLAS tier-1 sites with 100% reliability during this period.

The LHCOPN network upgrade from 10Gbit/s to a 100Gbit/s (shared) in Denmark was completed. Within hours the usage was at 15-18Gbit/s.

NT1 resources were showcased by the recent set-up of a test environment for high bandwidth transfer tests between SURFsara¹⁹ and NT1 in order to verify data flows from the Square Kilometer Array.²⁰ This will push the boundaries of technology by carrying out 100Gbit/s transfers between large production storage systems, as well as validating design assumptions for the upcoming SKA distributed computing.

¹⁷ <https://wlcg.web.cern.ch/collaboration/management/grid-deployment-board>

¹⁸ <http://wlcg-docs.web.cern.ch/wlcg-docs/?dir=reporting/reliability-availability/2019/10-19>

¹⁹ <https://userinfo.surfsara.nl/>

²⁰ <https://www.skatelescope.org/>

TRYGGVE

The Tryggve project is developing a Nordic platform for sensitive data by utilising and connecting national capabilities and services in the Nordic countries. The project is funded by NeIC and the ELIXIR nodes in Denmark, Finland, Norway and Sweden. Tryggve develops state-of-the-art scalable infrastructure for safe, efficient, ethical, and legal storage, analysis and sharing of sensitive personal data for biomedical research between countries. The aim is for the Tryggve project to enable research involving sensitive data to be performed in secure settings, thus facilitating Nordic collaboration in biomedical research. The work is conducted in close collaboration with the user communities and Nordic e-infrastructure providers.

To facilitate the uptake of the services, Tryggve operates a use case programme that supports end-users in use of the secure e-infrastructure. The requirements

emerging from the use cases feed into the development work. Use cases receive support from Tryggve in accessing and moving research data, meeting legal and ethical requirements, accessing secure data analysis platforms, sharing data with colleagues, installing software and accessing data archives.

STATUS REPORT 2019

Indicators: Project outputs have been presented in various events including NeIC2019 in Copenhagen, the ELIXIR all-hands meeting in Lisbon, and the RDA Plenary conference in Helsinki. Several publications not directly connected to the project have referred to the pioneering work of Tryggve, for example the NordForsk NOS-M committee report²¹ and Nature publications on

21 <https://www.nordforsk.org/en/publications/publications-container/nos-m-report-personalised-medicine-in-the-nordic-countries>



Nordic precision medicine initiative²² and the European “1+ Million Genomes” Initiative²³. The European “1+ Million Genomes” Initiative for secure cross-border and federated data access recognised the NeIC Tryggve sensitive data infrastructure as a potential platform for offering access to genomic data in accordance with European and global standards.

Members of the Tryggve project participated in the Global Alliance for Genomics and Health (GA4GH) Plenary meeting in Boston, US, on 21–24 October and presented the latest outcomes of the project, including the technological development in sensitive data archiving and in the federated analysis platform. Also, together with Docker Inc. and NERSC, Tryggve organised the 5th High Performance Containers Workshop (HPCW 2019) that was held in conjunction with ISC High Performance 2019 in Frankfurt, Germany.

Effects: There have been significant advances on development of cross-border sensitive data infrastructure: deployment of sensitive data repositories based on EGA technology, designing and developing cross-border workflow tools, taking into use multi-factor authentication, and not least, supporting several research use cases.

Tryggve deployed the codebase for a federated instance of the European Genome-phenome Archive (EGA) infrastructure in the intended secure production environments and demonstrated for the first time a full-chain data submission and secure data access in EGA²⁴ Federation at the ELIXIR all-hands meeting in Lisbon (June 17–20, 2019).

In order to meet the needs of the ELSI (ethical, legal and social implications) recommendations and assist cross-border research collaborators in complying with these, Tryggve developed an ELSI check-list²⁵ on ELSI issues and GDPR compliance. These are topics that require close attention when dealing with human data. The checklist is meant to be a tool to help projects to be aware of the requirements and identify gaps in these areas for the particular research cross-border collaborations, as this is something that many projects struggle with.

22 Nature Genetics: P.R.Njolstad et.al. “Roadmap for a precision-medicine initiative in the Nordic region”, (2019). <https://doi.org/10.1038/s41588-019-0391-1>

23 Nature Reviews Genetics: G.Saunders et.al. “Leveraging European infrastructures to access 1 million human genomes by 2022”, (2019). <https://doi.org/10.1038/s41576-019-0156-9>

24 <https://www.youtube.com/watch?v=EQeat8ywtI0&feature=youtu.be>

25 https://neic.no/tryggve/files/Tryggve_ELSI_checklist_v1.0_2019-12-17.docx

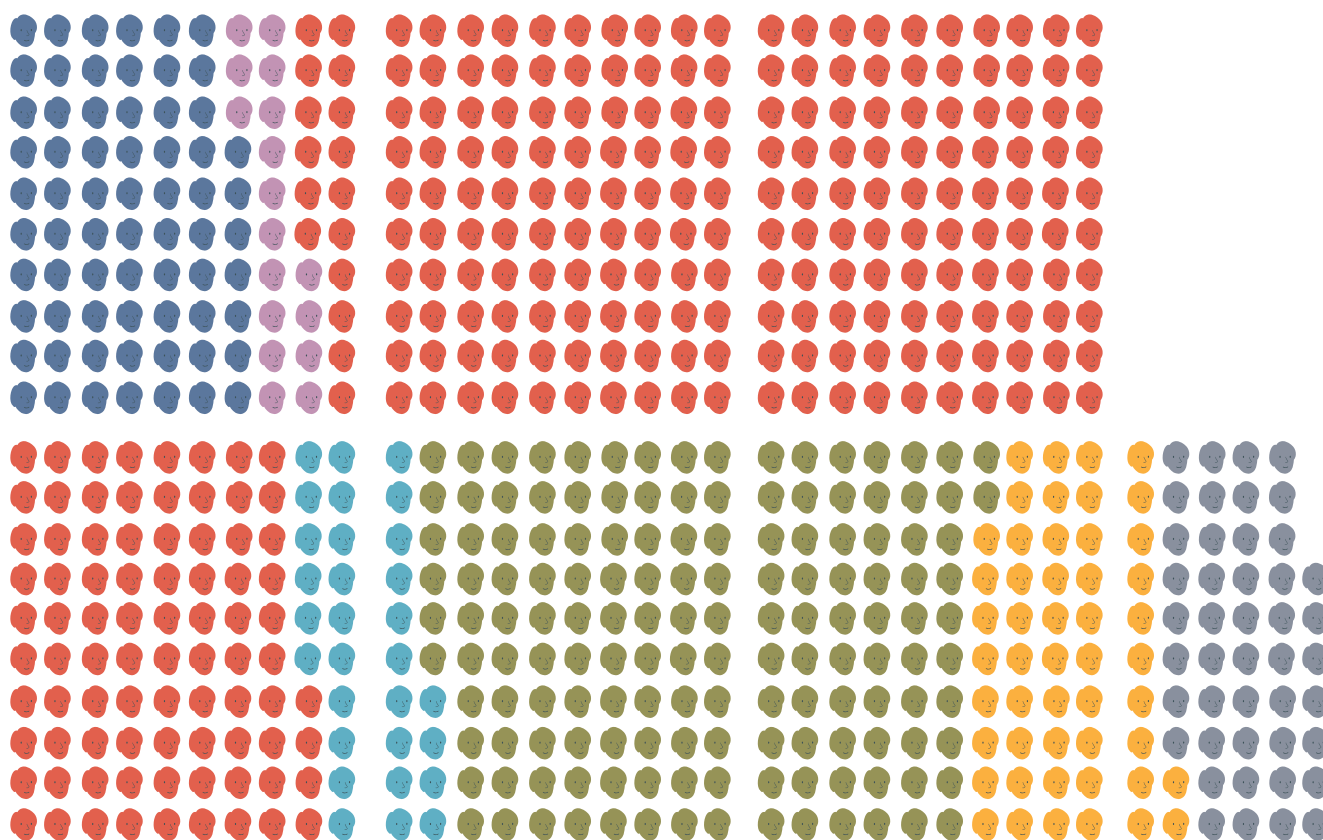


05

EVENTS AND WORKSHOPS

05

People trained by NeIC



= 657

People trained in FAIR Data stewardship in 2019: **67**

People trained in Project Management in 2019: **17**

People trained in research software development tools and practices in 2019: **300**

People trained in CodeRefinery Instructor training in 2019: **30**

People trained in e-infrastructure tools for the biodiversity field: **148**

People trained in e-infrastructure tools for Earth System Modelling: **50**

People trained in natural language processing methods: **45**

NEIC2019: NORDIC INFRASTRUCTURE FOR OPEN SCIENCE

Nearly 160 technical experts, researchers and decision-makers in computing and storage joined forces at the NeIC2019 conference. The event took place in Copenhagen, Denmark, from 14–16 May and included both workshops and conference sessions with high-profile Nordic, European and international speakers. NeIC has hosted the large bi-annual conference three times before: 2013 in Trondheim, 2015 in Espoo and 2017 in Umeå, bringing together the Nordic e-infrastructure community to discuss, develop ideas and prepare for the future.

In addition to giving people who work with e-infrastructure the opportunity to network with colleagues throughout the Nordic region, NeIC2019 was designed to help them to share knowledge and expertise. There were presentations of various types of Nordic e-infrastructure that facilitate research in areas such as climate, weather forecasting and health. Overall, the conference provided many examples of what can be achieved with good, reliable data across Nordic borders. As a summary commentary on the many presentations, Lene Krøl Andersen, Head of the eScience Centre at DeiC and EOSC-Nordic Project Manager, delivered one of the most compelling arguments for why Open Science is so vitally important:

“These days at the conference have shown that each of the Nordic countries is sitting on unique data that will extend beyond our lifetime. Therefore, Open Science and Nordic research cooperation is the key to solving the many challenges we face today”.

ALL-HANDS MEETING 2019

January 28th to January 31st, NeIC organised its annual All-hands Meeting (AHM). NeIC staff gathered for four days at Kvitfjell, Norway, to collaborate within and across NeIC’s ten projects. The event brought together 66 NeIC staff from the NeIC partner institutions. This year, the AHM19 was organised as a hackathon, where participants formed groups around 10 novel project ideas. The keynote speaker was Professor Steven Longmore from Liverpool John Moores University, who used Machine Learning algorithms developed in astrophysics for biodiversity conservation tasks.

FAIR DATA STEWARDSHIP TRAINING

FAIR Data is data that are Findable, Accessible, Interoperable and Reusable by computers. New requirements from national and international funders are driving the need for training of competent, professional data stewards and data managers with knowledge of the FAIR principles and their application. In keeping with its strategy to act as a global role model, NeIC is seeking to drive the establishment of FAIR Data Stewardship as a new profession. With this in mind, NeIC organised two full-fledged training courses to provide the much-needed foundational skills for competent data stewards and data managers. In March NeIC organised a 4-day training course in Oslo with 36 participants. This was followed by a 5-day course organised together with DeiC in November in Kastrup with 31 participants. The courses were taught by Dr. Luiz Bonino and Dr. Mark Wilkinson from Phortos Consultants. Participants received a GO FAIR Readiness Certificate of Attendance after completing the courses.

CODEREFINERY WORKSHOPS

During 2019, CodeRefinery held these workshops across the Nordic countries to teach students and researchers how to write better code and provide research groups with software development e-infrastructure tools:

3-DAY WORKSHOPS

- [Espoo, 10-12 December 2019](#)
- [Stockholm, 19-21 November 2019](#)
- [Trondheim, 22-24 October 2019](#)
- [Aalborg, 11-13 June 2019](#)
- [Oslo, 3-5 June 2019](#)
- [Helsinki, 27-29 May 2019](#)
- [Gothenburg, 21-23 May 2019](#)
- [Tartu, 2-4 April 2019](#)
- [Stockholm, 25-27 March 2019](#)

OTHER CODEREFINERY EVENTS AND WORKSHOPS

- [Online, 13 December 2019](#)
- [Lille, 25 November - 5 December 2019](#)
- [Stockholm hackathon, 6-7 November 2019](#)
- [Stockholm instructor training workshop, 4-5 November 2019](#)
- [Stockholm reproducibility workshop, 9 and 12 September 2019](#)
- [Oslo, 1-5 April 2019](#)
- [Copenhagen, 5 March 2019](#)
- [Oslo, 27 February 2019](#)

SOFTWARE CARPENTRY TRAINING WORKSHOP

This training workshop, held by Software Carpentry, was supported by the Ratatosk²⁶ Course Mobility Grants. The workshop took place 17- 18 January 2019 in Tartu with 24 participants. Software Carpentry aims to help researchers get their work done in less time and with less pain by teaching them basic research computing skills. This hands-on workshop covered basic concepts and tools, including program design, version control, data management, and task automation. Participants were encouraged to help one another and to apply what they have learned to their own research problems.

²⁶ Ratatosk was a NeIC project aimed at facilitating training across the Nordic region. The project ended in 2018.



06

SOCIAL RESPONSIBILITY



06

OPENNESS AND TRANSPARENCY

One of NeIC's key tasks is to remove friction from distributed work and cross-border collaborations. We do this in many different ways. One is by striving to be as open and transparent as possible. This means that most information produced by NeIC is freely available on the NeIC wiki or NeIC's Indico event management system. Here you can find minutes from project team meetings, steering group meetings, reference group meetings, board meetings and provider forum meetings. You can also stay updated on project progress, achieved milestones or read NeIC policy documents, annual accounts and self-assessment reports. In 2019, NeIC also started sending out newsletters after each NeIC board meeting with the latest news and updates from the meeting. You can sign up to the newsletter at neic.no. The NeIC policy is to openly share as much information as possible. However, there are some items unsuitable for public disclosure, such as management of personnel issues, preliminary budget figures, or early details of potential new projects.

EQUALITY AND DIVERSITY

NeIC benefits greatly from utilising a wide range of experiences and perspectives. The NeIC HR Policy is based on equal opportunity in employment practices without discrimination on the grounds of race, religious beliefs, colour, gender, sexual orientation, disability, place of origin, age, marital status, or family status. NeIC promotes equality, equal terms and diversity and strives for gender balance amongst its staff. NeIC also encourages diversity in skills, background and gender in our governance structure, including the composition of advisory groups, steering groups, and the NeIC Board.

NeIC implemented a new policy in 2018 to compile and publish annual statistics showing the gender ratio within NeIC projects, project leadership, project steering and additional advisory or reference groups. You can find an overview over NeIC gender statistics here:

GENDER BALANCE STATISTICS

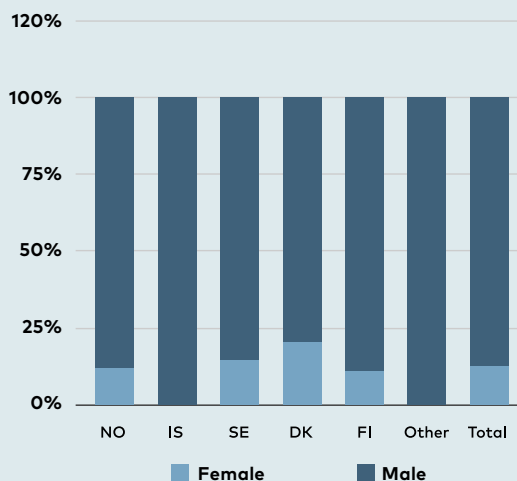
	♀ count	of	% of ♀
Functions including board, working groups, steering groups, programme committee and reference groups	33	121	27.2% (26.5% in 2018)
NeIC project staff (including Executive Team)	32 (23 in 2018)	183	17.5% (15.6% in 2018)
EOSC-Nordic staff	45	117	38.46%
Total NeIC and EOSC-Nordic staff	77	300	25.7%

STAFF

Overall staff number: 183 as of 1 December 2019.

- FTE-weighted females out of total: 12% (17.20% in 2018)
 - FTE-weighted count per country of home institution/residence:
 - DK: 19% FTEw
 - FI: 10% FTEw
 - IS: 0% FTEw
 - NO: 11% FTEw
 - SE: 14% FTEw
 - (other): 0% FTEw

Gender Balance NeIC staff 2019



In addition to gender statistics, NeIC also carries out an annual staff survey to obtain information about wellbeing and motivation among its staff. The survey results will be used to provide insight into how NeIC can continually improve as an organisation in order to be attractive to competent staff.

ENVIRONMENTAL SUSTAINABILITY

NeIC is an organisation distributed across various locations within the Nordic countries and Estonia. This way of working entails several considerations that are not relevant for the more traditional project teams. Perhaps most important is the need for good communication and collaboration within the regional teams. We therefore place great emphasis on regular meetings at all levels of the organisation. We have invested in environmentally friendly technological communication tools to increase the quantity and quality of NeIC collaboration without causing harm to the environment. In 2019, NeIC management participated in more than 550 video meetings in order to reduce travel. In addition to this, NeIC internal communication/interactions take place through emails, video conferences and a community chat tool. The NeIC community chat has 312 users (up from 225 users in 2018) that sent a total of 28,157 messages in 2019. By utilising these technological tools, we are reducing our environmental footprint while still facilitating a collaborative environment.

A full-page photograph of a hiker with a beard, wearing a blue plaid shirt, dark pants, and a black beanie, carrying a large red backpack. The hiker is stepping across a rocky stream in a vast, mountainous landscape with autumn-colored vegetation and snow-dusted peaks in the background under a cloudy sky.

07

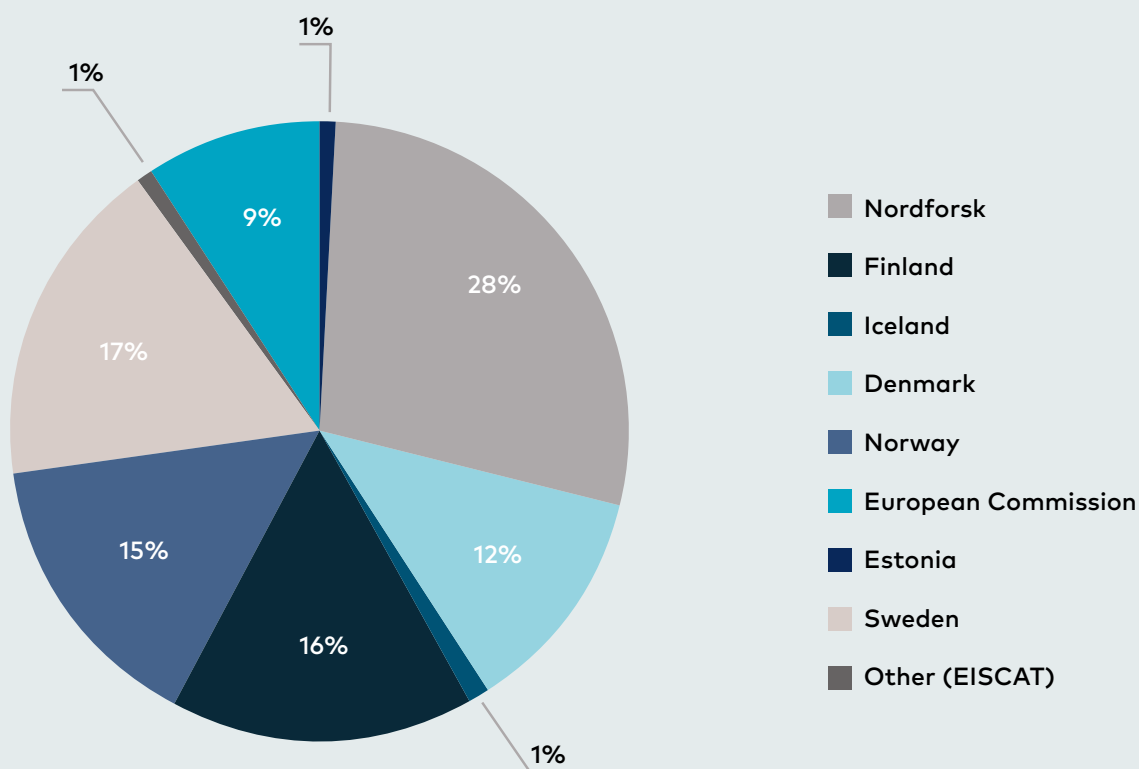
2019 ACCOUNTS

07

2019 ACCOUNTS

Funding for NeIC activities is provided through national funding agencies, NordForsk and participating project partners. In 2019, national contributions of NOK 14.6 million (same as 2018) prompted NordForsk co-funding of NOK 20 million (same as 2018) and partner co-funding of NOK 33.3 million (NOK 27.6 million in 2018),

which was spent on activities carried out by national e-infrastructure provider organisations and university partners. The chart below provides an overview of the funding for NeIC activities from each country as well as NordForsk. “Other” here includes funding from Estonia and from EISCAT.



07

		Partner funding in-kind
NordForsk	20,000,000	2.11
NordForsk-Other		
DK-DeiC/DASTI	3,600,000	0.88
DK-Other		3.61
FI-CSC/AKA	3,600,000	5.66
FI-Other		1.3
NO-Sigma2/RCN	3,600,000	2.49
NO-Other		3.33
SE-SNIC/SRC	3,600,000	1.88
SE-Other		5.56
IS-Rhnet	200,000	0.25
IS-Other		0.08
EOSC-Nordic grant	6,450,000	
Other Partners/Unallocated	794,499	1.19
Transferred from last year	8,302,051	
Total income	50,146,550	28.34
NeIC Coordination	6,653,836	2.11
NeIC XT	4,006,847	2.11
Travel	381,097	
Communication personnel	88,134	
Communication	120,096	
Representation, meetings	4,774	
NeIC XT meeting costs	124,190	
Board meetings	87,152	
NeIC Events	666,509	
Management training	482,232	

2019 ACCOUNTS

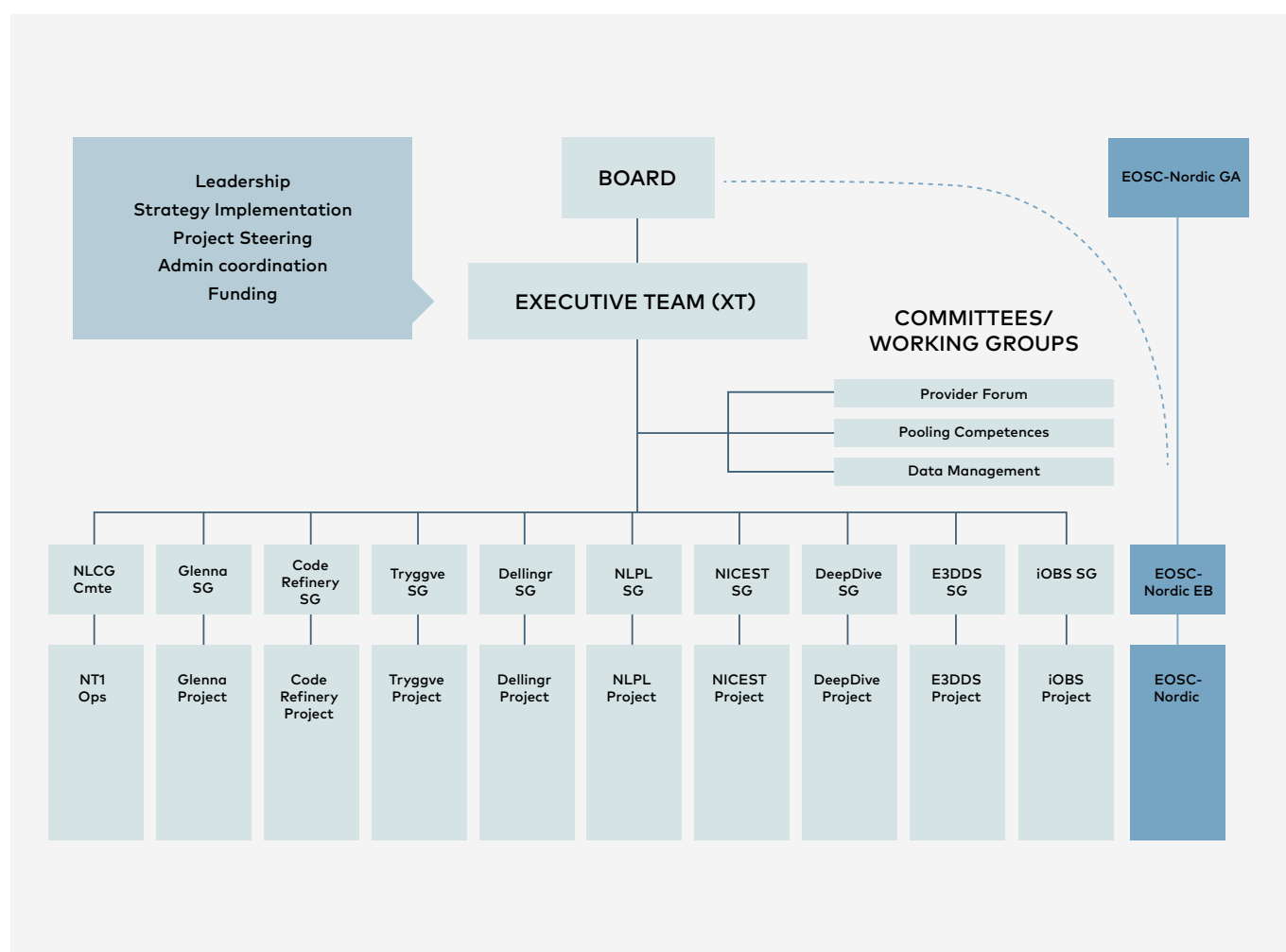
Workshops, working groups and new initiatives	654,886	
Miscellaneous	37,920	
Operations and Development	40,781,148	26.24
NT1 Personnel costs	6,577,786	4.62
NT1 Travel and meeting costs	491,621	
WLCG NORDUnet costs	3,592,225	
Tryggve2 Personnel costs	8,431,282	8
Tryggve2 Travel and meeting costs	488,322	
Glenna2 Personnel costs	4,879,381	3.38
Glenna2 Travel and meeting costs	151,663	
CodeRefinery Personnel costs	1,411,628	1.88
CodeRefinery Travel, infrastructure and membership	156,664	
Dellingr Personnel costs	2,296,874	1.98
Dellingr Meeting and travel, services	115,025	
NLPL Personnel costs	1,908,250	1
NLP Travel and meeting costs	122,546	
iOBS Personnel costs	1,284,621	1.74
iOBS Travel and meeting costs	57,942	
E3DDS Personnel costs	203,337	0.88
E3DDS Travel and meeting costs	20,622	
NICEST Personnel costs	1,329,261	1.88
NICEST Travel and meeting costs	66,807	
DeepDive Personnel costs	644,513	0.88
DeepDive Travel and meeting costs	100,779	
EOSC-Nordic	6,450,000	
NeIC Total	47,434,983	28.34
Transfer to next year	2,711,567	

08

ORGANISATION

08

NEIC ORGANISATIONAL CHART



STAFF

NeIC had a staff of 183 members as of December 2019 (151 in December 2018). In addition to this, there are 117 staff members at the EOSC-Nordic project (18 of these are also on regular NeIC contracts).

PARTNERS

Below is an overview of the 52 partners we worked with throughout 2019 (42 in 2018).

Denmark

Aarhus University
Danish e-infrastructure Cooperation (DeiC)
Danish Meteorological Institute
Danish National Archives
IT University of Copenhagen
NORDUnet
The Capital Region of Denmark
Technical University of Denmark
University of Copenhagen
University of Southern Denmark

Finland

CSC - IT Center for Science Ltd
Finnish Meteorological Institute
Finnish Museum of Natural History
Helsinki University
Tampere University
Turku University
University of Eastern Finland

Iceland

Icelandic Institute of Natural History
RHnet
University of Iceland

Norway

Arctic University of Norway
Met Norway
Nansen Environmental and Remote Sensing Center
Norwegian Centre for Research Data
Norwegian Institute for Nature Research
Norwegian University of Science and Technology
Uni Research Klima
UNINETT Sigma2
University of Bergen
University of Oslo

Sweden

ArtDatabanken, Swedish University of Agriculture
Göteborg University
HPC2N, University of Umeå
Lund University
National Bioinformatics Infrastructure Sweden

National Supercomputing Centre (NSC), University of Linköping
Royal Institute of Technology (KTH)
Swedish National Infrastructure for Computing (SNIC)
Swedish Meteorological and Hydrological Institute
Swedish Research Council
Uppsala University

Estonia

ETAIS
Museum of National History
National Institute of Chemical Physics and Biophysics (KBFI)
Tartu University

Other

EISCAT
German Climate Computing Centre (Germany)
Go Fair Foundation (Netherlands)
Riga Technical University (Latvia)
SixSq (Switzerland)
University of Vilnius (Lithuania)

BOARD

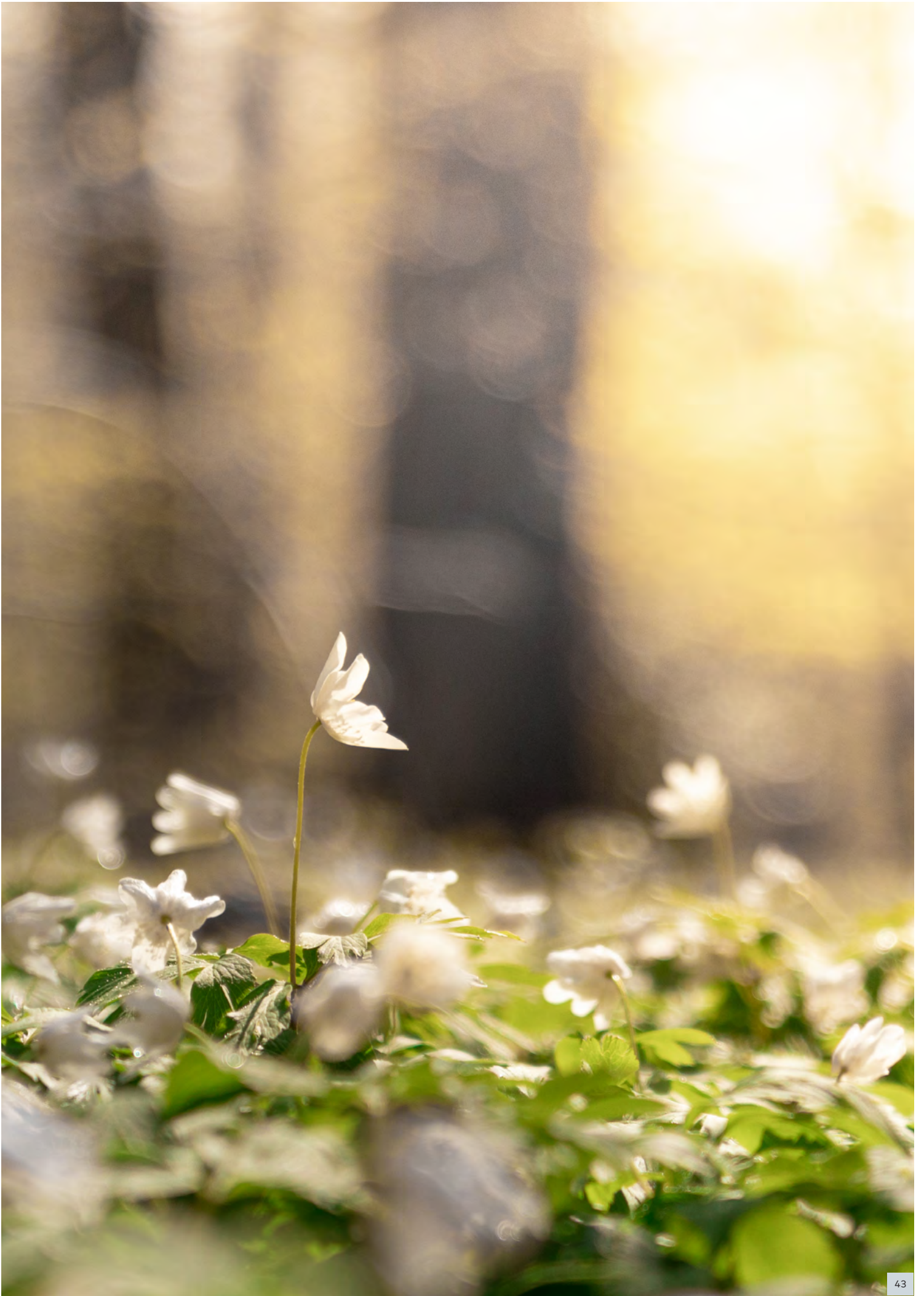
The board is the governance body of NeIC and includes the Nordic e-infrastructure provider organisations.

Chair: Hans Karlsson, SNIC, SE
Hans Eide, Sigma2, NO
Ivar Koppel, ETAIS, EE (observer in 2019)
Jon Ingi Einarsson, RHnet Iceland, IS
Pekka Lehtovuori, CSC - IT Center for Science Ltd, FI
Steen Pedersen, DeiC, DK

EXECUTIVE TEAM

The executive team is the management body of NeIC and includes project office and strategy implementation.

Gudmund Høst, NordForsk, NO, Director
Johanna Törnroos, CSC, FI, Senior Advisor
Kine Bugge Halvorsen, NordForsk, NO, Senior Advisor
Michaela Barth, KTH, SE, Executive Manager
Rob Pennington, US, Special Advisor
Tomasz Malkiewicz, CSC, FI, Executive Manager





Address:
c/o NordForsk
Stensberggata 27,
NO-0170 Oslo

Phone: +47 476 14 400

E-mail:
gudmund.host@nordforsk.org
kine.halvorsen@nordforsk.org



NordForsk