

1. Summary

In 2024, SITES entered the second year of the current funding phase (2023-2028). Highlights from the year include;

- 1) **Productive research**; 493 scientific projects and 187 peer-reviewed papers
- 2) **Increased data mobilization**; 197 data uploads and 3,569 data downloads
- 3) **SITES-ICOS-ACTRIS coordination**; co-localization of SITES Water Lake in Abisko
- 4) **SITES Thematic Program upgrades**; purchased enhanced monitoring equipment

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2. Popular science

The Swedish Infrastructure for Ecosystem Science ([SITES](#)) is a network of stations that enables field-based ecosystem research. Each station brings unique research foci, expertise, experiments, long-term monitoring and societal settings to the infrastructure built on shared scientific goals and methodologies. To facilitate comparison between climate zones, landscape elements and management systems, as well as to strengthen the collaboration within the network of stations, SITES stations participate in Thematic Programs focused on remote sensing, water monitoring and aquatic mesocosms. SITES focuses on terrestrial and freshwater ecosystems and recognizes the connectivity of elements within landscapes and between regions. Open access to the infrastructure and data attracts national and international scientists, facilitating excellent environmental science. This has made SITES a highly valued, critically important infrastructure for research on Swedish ecosystems and landscapes, not least in the context of how the Earth System will respond to drivers of environmental change.

3. Description of Operations

SITES contributes to long-term, field-based ecosystem research at a top level by offering a unique infrastructure and scientific competence that attracts researchers to the SITES stations and use of SITES data. To accomplish this, SITES features six modules; Organizational Leadership (Module 1), Station-based User Support (Module 2), Data Coordination and Analysis (Module 3), and three Thematic Programs (TPs) – Water (Module 4), Spectral (Module 5), and AquaNet (Module 6).

3.1. *Time Plan* (See Gantt Chart)

SITES activities in 2024 corresponded to the deliverables outlined in the SITES time plan, with no changes to the Gantt Chart. From an organizational perspective, SITES hosted meetings, which included the Steering Group (SG) (6 meetings), Partner Organizations Advisory Board (1 meeting), and Management Team (1 meeting/mo). Communication with the Scientific Advisory Board (SAB) was taken online. Most meetings were virtual, however, an in-person Management Team meeting took place at Grimsö and a SG meeting was held at Skogaryd. With the documentation for the new funding phase established, the Business Plan and Communication Plan was the main focus in 2024. SITES communication efforts included a quarterly newsletter, weekly news highlights and social media posts. The station-specific infrastructure (Module 2) and TPs (Module 4-6) in SITES enabled high quality and relevant research by an extensive research community in 2024 (see *Section 7*). The three TPs are well established. They actively support and enhance research on aquatic and terrestrial landscape components as well as their functioning. Each station and TP interacts closely with Data Coordination and Analysis (Module 3) for data mobilization and archiving in the Data Portal.

Data are continuously updated for the TPs and new station specific time series have been added to the SITES data catalogue (see *Section 7*). Training and workshops related to data and the TPs continued in 2024.

3.2. Development and operations

SITES continues to provide open access and user-based support (see *Section 7*), which includes both physical and remote access to the stations, as well as maintaining and mobilizing SITES data, including station specific data and data linked to the TPs. Maintaining the SITES Data Portal, an open data repository, is key to data mobilization (see *Section 3.4*). Again this year there were nearly 200 data uploads (197 and 191 uploads in 2024 and 2023, respectively), which includes both new and updated datasets. The TPs continue to be the main source of data uploads to the Data Portal, however, in 2024, agricultural data from the [SITES Agroecological Field Experiments](#) (SAFE) and the ability to upload [SITES community project data](#) were major achievements in providing user-based support data to the Data Portal. To promote access to aquatic and terrestrial experiments, a call was opened at the end of 2024 for AquaNet users in 2025, and the SAFE infrastructure was presented at the 18th Congress of the European Society for Agronomy, respectively. To increase physical access to the forest field trials, [Silvaboreal Archive](#) was created to highlight the available plant and soil material for users to access.

SITES equipment budget is mainly for servicing and upgrading instrumentation within the TPs. SITES submitted and was approved an “Equipment Purchase Extension” by VR. All equipment funds were used and reported in 2024. Specifically, within SITES Spectral, upgraded drones were ordered by all stations and its use will be implemented in 2025. In preparation for SITES AquaNet lake mesocosm experiments in 2025, replacement sensors/loggers and a robust hand-held multi-probe were purchased. For SITES Water, specific station equipment needs were identified, in addition to replacement loggers, repairs, and upgrades to discharge instrumentation at all stations.

3.3. Collaboration with other infrastructures

Collaboration with similar infrastructures and networks across Sweden is a high priority for SITES ([list of collaborations](#)) and includes collaborations with data services and mobilization. In 2024, the SITES calendar and associated monthly news items were focused on collaborations that increase the number of projects that utilize multiple SITES stations and connect between aquatic and terrestrial processes.

Nationally, SITES has established strong links with ICOS-Sweden via the Data Portal and valuable co-localization as identified in the SITES-ICOS-ACTRIS report to VR. In 2024, at Abisko, the move of SITES Water lake monitoring to Stordalen, where infrastructure within SITES Spectral and ICOS are already established, was initiated. SITES further collaborates with INTERACT on the development and operation of SITES/INTERACT GIS. SITES is using the protocols established by SBDI for archiving sequences and publishing species lists and will create cross references between databases once the data has been successfully published. This ensures that SITES uses internationally accepted standard ontologies and will maximize visibility of eDNA data collected by SITES by making it accessible via the ENA, SBDI, and GBIF.

Internationally, SITES participates in strategically building the eLTER Research Infrastructure (RI) and submitted an application to the VR “Needs inventory of RI of national interest”. The evaluation of the application stressed that it is strategically important for Sweden and Swedish environmental and ecosystem research to be part of this RI, but that the application did not sufficiently mention how a membership will strengthen Swedish research. Taking this

feedback into account, SITES, together with LTER Sweden, plans to submit an application to the next round of VR “Needs inventory of RI of national interest” to include SITES and Sweden in the eLTER RI. SITES collaborates with the Critical Zone– Network of Networks (CZ-NoN), which brings together CZ-NoN networks in the US and Europe (France, Germany, Sweden) to connect research communities and promote transdisciplinary research. Additionally, SITES continues to engage with the Global Lake Ecological Observatory Network (GLEON) and LifePlan – A planetary inventory of life.

3.4. Data management and supporting e-infrastructure

The [SITES Data Portal](#) has been in full operation for several years. Further development of the software tools, data and metadata catalogue focuses on increasing the FAIRness of SITES data. The overarching aims are to increase the discoverability of SITES open data, broaden the user base within the research community, and continue to improve the user experience of the Data Portal. Contributors from SITES and the Carbon Portal have become part of an expert group formed by the Swedish National Data Service (SND) for establishing common metadata formats across research fields. This promotes alignment of metadata established by SITES with a national metadata research catalogue and the exchange of expertise across RIs.

SITES Data Management Plan ([DMP](#)) guides the data work. The Data Management Group meets regularly for in-depth discussions on metadata structure, common ontologies and system developments. Established workflows and increased knowledge of data requirements, tools and standards across the infrastructure and data contributors has reduced the need for meetings to a quarterly basis, but the Secretariat and ICOS Carbon Portal team continued to meet on a weekly basis to discuss the data service portfolio. In 2024, there was an increased focus on open-source data work, with training and code development in R.

4. Changes in organisation

In 2024, several new SITES Station Managers were welcomed to SITES. At Abisko, Magnus Augner retired and was replaced by Margareta Johansson. At Skogaryd, Tobias Rutting and Amelie Lindgren shared the position for a few months until Lindgren officially took the role in June. At Svartberget Jenny Viklund took another government position in Sept, and Charlotta Erefur is acting Station Manager during a period of reorganizing responsibilities. In the latter part of 2024, SITES Deputy Director went on parental leave, with her task distributed across the Secretariat and SITES Data Manager reduced to 50% (with the other 50% for work on eLTER). To help support communication, admin and data tasks during that time, a person was hired to the Secretariat in Sept (full time 6-mo position, with the possibility to extend 6-mo).

5. Steering Group Activities

The SITES SG is appointed by SLU with the mandate to oversee the infrastructure in line with the governing documents and in cooperation with the Partner Organizations. A new SG was selected with the mandate period from 2024-04-01 to 2027-03-31 and consists of seven members (4 Females and 3 Males), covering SITES disciplines and representing different Universities within Sweden (SLU, SU, GU, LU) and abroad (Copenhagen University and LUKE). Since only one member from the previous SG remained on, to help ease the transition Stefan Bertilsson (previous SITES Director) was appointed chair of the SG for 18 months. In 2024, the SG met six times (two with the previous SG and four with the new SG), including an in-person meeting for the new SG at Skogaryd station in November. The main topics covered by the SG included operational documentation, strategic partnerships, and data management. A main task for the new SG is to coordinate the SITES internal evaluation in communication with the SAB.

6. Financial outcome (See Economic Reporting)

The funding for SITES is partly covered by an infrastructure grant awarded by VR (19 577 kSEK/ year), and partly from equivalent or larger co-funding from the SITES consortium Partner Organizations. The financial report includes both the central coordination functions within the Secretariat and the SITES activities at the individual stations for the year 2024. The negative financial results for most of the stations and also for the infrastructure as a whole reflects an increased level of co-financing by the partners that is needed to maintain strategically important activities and programs at the SITES stations. Also, in 2024 all equipment funds needed to be spent, although in the budget the equipment is spread over the whole funding cycle and thus inflates financial results for 2024.

7. Key numbers (See Nyckeltal)

In 2024, a total of 493 scientific projects were carried out at SITES stations, which is on par with previous years (range of 492-518 projects). The total number of user days continues to increase (2024: 20,065, 2023: 19,630, 2022: 18,228) with a majority being physical access.

SITES is a national infrastructure open to all researchers and offers access to the infrastructure according to the equal conditions principle. SITES is also actively working through outreach and distribution of information to be diverse, inclusive, and equitable. The number of unique users involved in scientific projects that have used any SITES station was 887 in 2024, which is slightly less than 949 unique users in 2023. In 2024, project leaders within Sweden were from 9 universities and 18 research institutes/organizations and internationally were from 34 different academic affiliations, representing 22 countries.

The Data Portal became fully operational in autumn 2019, and the number of openly available data sets as well as the different data types has been increasing ever since. In 2024, there was 3,569 total data downloads from the Data Portal, which is a 20% increase from the previous year. Total number of single user access in 2024 was 967, which is similar to 2023.

8. Publication list (See Publication List)

A total of 187 peer-reviewed articles were published in scientific journals in 2024, which is consistent with the previous two years. Published articles were divided into research fields based on SCB's standard for the Swedish division of research topics. Combined, Earth and related Environmental Sciences (39.6%) and Biological Sciences (43.3%), made up a majority of the publications, with Agricultural Science (17.2%) making up the next largest subject area.

9. Equality (See Nyckeltal)

Gender equality is one aspect of SITES ambition to be diverse, inclusive, and equitable. As outlined in the [SITES Gender Equality Plan](#), the annual reporting is one way to address these ambitions. This is the third year SITES has collected information on gender and position distribution among station employees, and thus the second year a comparison can be made. There was a total of 84 staff that worked for SITES in 2024, of which 36 were female and 48 were male, meeting the EU gender 40–60% balance aspiration. However, the summed hours worked by females was only 34% of the total hours and females tended to work < 0.5 FTE. This trend is similar to the two previous years. Females tend to hold Research Assistant and Lab Technician positions, whereas males tend to hold Research Engineer and Technician positions, with both genders evenly holding Field Technician and coordination positions.

In 2024, the SITES Management Team (Station Managers and TP leads) included 3 females and 7 males at the start of the year, however, with the rotation of Station Managers in 2024 (See Section 4) there were 5 females and 5 males by the end of the year. The Secretariat was

made up of 5 males and 3 females. SITES (via SLU as host organization) appoints the SAB (3 females and 3 males) and SG (4 females and 3 males), where maintaining gender balance is one aspect taken into consideration when forming the groups (*See Section 5*).

Of scientific project leaders, the percentage of project leaders was 31% female and 69% male in 2024, with greater gender balance seen the previous year. In terms of career stage, 77% of project leads were senior (22% female and 55% male) and 23% of project leaders were junior in their career (8% female and 15% male). SITES acknowledges the importance of early career opportunities, including project leadership, and is actively working to promote early career research, e.g. through highlighting early career research via SITES communication channels. Among all project users where gender was reported, the percentage for females and males was more even compared to previous years (46% female and 54% male). Though reporting of gender is not required for training development and outreach projects, of the projects that reported gender, 41% of participants were female and 59% were male.

10. Risk analysis

SITES has had to make financial decisions (e.g. prioritization of equipment investments) as inflation and associated cost have increased since the budget was determined. For some stations this has resulted in increased co-funding to cover cost and for others prioritizations have had to be made. Increased cost in general continue to pose a risk for SITES over the funding phase, e.g., increased cost of employees and lab analysis. Many universities are increasing their online security (e.g. firewall), which has caused logistical challenges and additional cost to the stations. Continued budget monitoring and strategic discussions will be needed to address these challenges.

Several SITES Station Managers left their post in 2024 (Svartberget, Skogaryd and Abisko), where meetings with the outgoing and incoming Station Managers were set up to help transfer knowledge and ease the transition. Given the Steering Group also rotated in 2024, a focus on in-person discussions and community building is a high priority for 2025.

11. Educational efforts, outreach and user support

One of SITES strategic goals is to increase scientific courses and meetings at the stations. This creates opportunities to show the participants what SITES has to offer to the research community and increases knowledge about the research that is currently conducted within the infrastructure. It also promotes contacts and networking between researchers and station staff. The total training development and outreach projects carried out at SITES stations amounted to 274, which is the largest amount of training development and outreach projects reported for SITES and nearly double the projects reported in 2022. Training (n=82) and site visits (n=82) made up more than half the total number of projects. The total number of unique SITES users from training development and outreach projects was 4,790 and corresponded to 9,863 user days, which is now on par with the pre-pandemic period (4,964 users and > 9,000 user days in 2019). A major outreach effort in 2024, was the IUFRO World Congress excursion at Erken, which brought over 150 international participants to visit the station, to learn about SITES as well as long-term forestry research and national environmental monitoring in Sweden and at the SITES stations.

12. Miscellaneous