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## Swiss Polar Institute Flagship Initiatives

### Call for Proposals

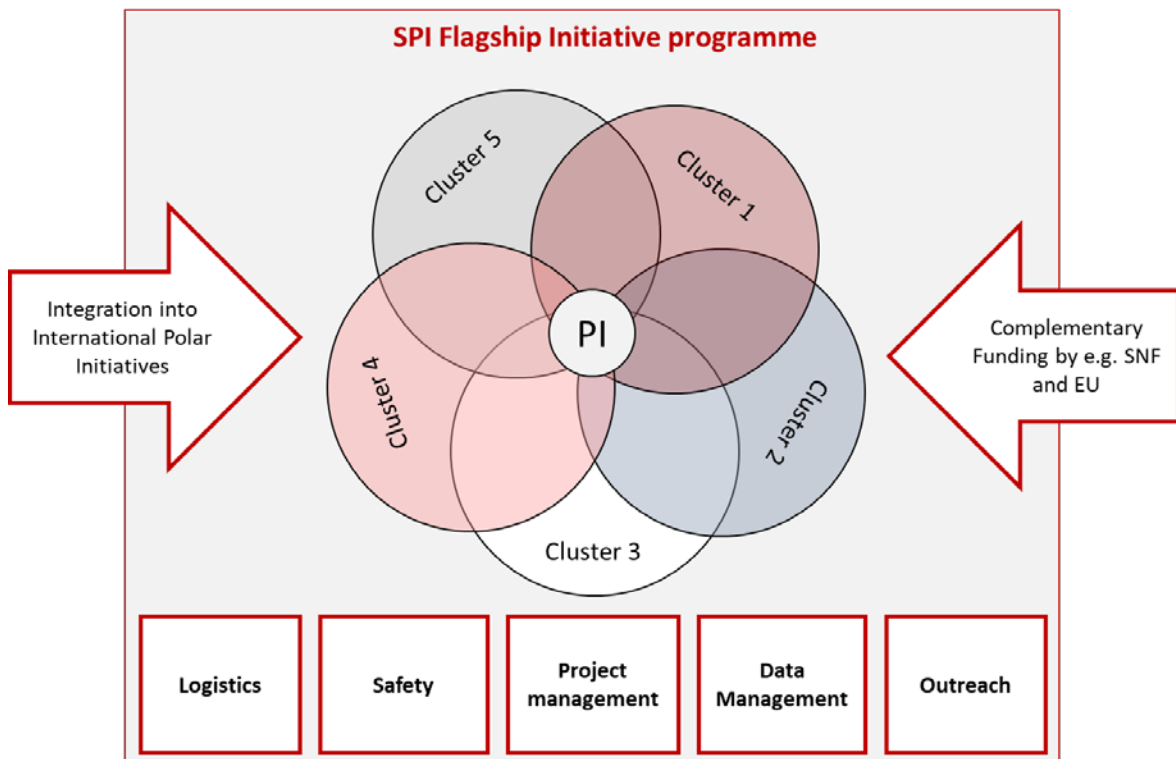
Deadline pre-proposals: 23 April 2021

Deadline full proposal: 22 October 2021

1	Summary.....	2
2	Eligibility .....	3
2.1	Swiss researchers .....	3
2.2	International collaboration.....	3
3	Duration and geographic focus .....	3
4	Budget and budgetary structure .....	4
4.1	Eligible costs .....	4
4.2	Budgetary structure.....	5
4.3	Non-eligible costs and complementary funding .....	5
4.4	Additional costs and services covered by the SPI.....	5
5	Governance .....	6
6	Data management and open science .....	8
7	Two-stage proposal process and evaluation .....	8
7.1	Call for pre-proposals .....	9
7.2	Information events .....	9
7.3	Assessment of pre-proposals and recommendations.....	9
7.4	Full proposal .....	10
7.5	Announcement of selected proposals, grants and start of the programmes .....	10
8	Appendix 1: Hypothetical example SPI Flagship Initiative .....	11

## 1 Summary

SPI Flagship Initiatives are multi-annual programmes combining science and technology projects from different disciplines and different groups / institutions in Switzerland around a polar or remote high-altitude focus region. The funding will be focused on field campaigns (logistics, safety, etc.), data management, outreach, and programme coordination, thus providing temporary infrastructure for a Swiss-led polar or remote high-altitude research programme.



The SPI Flagship Initiatives funding instrument aims to:

- Enable innovative, high-quality, Swiss-coordinated research programmes that require field work in polar or remote high-altitude regions;
- Fund logistics, access and other enabling measures, complementing project funding by e.g. SNSF or EU;
- Enable mid-term science programmes by providing multi-annual funding;
- Generate synergies (science, logistics, data) between Swiss groups of different disciplines;
- Foster multi-disciplinary research (where each 'research cluster' represents one thematic unit);
- Enable links with international initiatives and other national programmes;
- Enable high common standards of data management, open science, safety and public outreach.

## **2 Eligibility**

### **2.1 Swiss researchers**

All researchers affiliated to a Swiss public research institution with an interest in polar or remote high-altitude regions will be invited to prepare and submit proposals. Multi-disciplinary collaboration will be a central element of each SPI Flagship Initiative. Researchers from all fields are encouraged to participate in proposals, including from fields considered as “non-typical” for polar sciences and fields which do not themselves require fieldwork but are essential in reaching the overall aim of the proposed research.

SPI Flagship Initiatives should not be approached as single research projects but as programmes bringing together and coordinating different groups and research questions with a similar regional focus. Therefore, an inclusive approach by the PI of a proposal will be a crucial success factor.

### **2.2 International collaboration**

International collaboration is fundamental to polar research and encouraged within the SPI Flagship Initiatives. Collaboration between SPI Flagship Initiatives and established or emerging international programmes and international research infrastructure operators in the region of interest are encouraged. However, an overall balance in which the primary beneficiaries of SPI Flagship Initiative funding are Swiss-based scientists must be maintained. Therefore, direct SPI Flagship Initiatives funding (e.g. transport to field sites) will be reserved for Swiss-based scientists, and it is expected that all research clusters will be Swiss-led. Nevertheless, as the majority of funding for each SPI Flagship Initiative is envisioned to go towards logistics, international partners can 'pay their own way' and benefit from logistical and safety infrastructure provided on site through the SPI Flagship Initiative.

## **3 Duration and geographic focus**

The maximum duration of a SPI Flagship Initiative is 4 years. This means that the SPI Flagship Initiative must officially end after a maximum lengths of 4 years (i.e. all field work completed, grant instalments paid, financial reports received and approved). Acknowledging that data analysis, integration and publishing of final results will continue after the official end of a SPI Flagship Initiative, it will be possible to discuss continued support for e.g. data management after the official end date. No minimum or maximum number of field campaigns is prescribed to take place during the duration of a SPI Flagship Initiative.

SPI Flagship Initiatives are expected to be organised around a strong regional focus in order to maximise scientific (multi-disciplinary) synergies and optimise logistics as well as international collaboration. However, comparative studies targeting different field sites over the course of a programme are also possible. The call for proposals is open to research in any polar or remote high-altitude region.

## **4 Budget and budgetary structure**

Applicants can apply for funding up to CHF 1'500'000. Two SPI Flagship Initiatives are expected to be funded.

### **4.1 Eligible costs**

The SPI Flagship Initiatives funding instrument was designed to enable multi-year field access to remote polar or high-altitude field sites for Swiss scientists working on diverse research topics. The majority of funding should therefore go towards logistics, such as access to the field site, transport of personnel and equipment, and safety aspects specific to the particular field work.

In order to maximize the success of a multi-disciplinary, multi-annual SPI Flagship Initiative, the second funding emphasis is given to programme coordination and data management. The budget item 'programme coordination' can be used to support the salary of a scientific assistant to the PI (see also section 5.2), and to fund regular meetings.

The salary for a programme management assistant and a data manager will be provided directly by the SPI (both hired/based at the SPI to support the PI). Funding is available outside of the applicants' budget to cover aspects of data management, storage, and open science approaches. The exact spread of this funding is of course dependent on the exact nature of the SPI Flagship Initiative, and a data management plan and open science policy will be developed together with the SPI data manager (see also section 6).

The applicant is expected to use approximately 5% of their overall budget on outreach activities, both in Switzerland and in the region of their field work (if applicable). Collaboration with the SPI education programme Swiss Polar Class (<https://polar-class.ch/>) is encouraged and can be discussed during the proposal stage. Furthermore, costs for scientific outreach (e.g. participation in conferences) can be covered by this budget item, however the majority of outreach funding should go towards public outreach work.

Given the multi-annual nature of SPI Flagship Initiatives and the many unpredictable aspects of field work in remote areas, the applicant's budget must contain a 5% opportunity fund for unexpected developments during the programme. The use of this funding must be approved by each programmes steering committee (see section 5.4).

Costs for scientific equipment or sample analysis is not anticipated to be part of the applicants budget, but can be included if the applicant can provide clear justification.

**4.2 Budgetary structure**

<b>Budgetary structure for SPI Flagships Initiative</b>	
<b>Logistics</b> ( <i>access, transport, etc.</i> )	Around 65% of the overall costs
<b>Safety</b> ( <i>courses, field support, medical checks, etc.</i> )	Around 5% of the overall costs
<b>Programme coordination</b> ( <i>meetings, partial salary for assistant of PI, etc.</i> )	Around 20% of the overall costs
<b>Outreach</b> ( <i>public and scientific</i> )	Around 5% of the overall costs
<b>Opportunity fund</b>	5% of the overall costs
Analysis, Equipment	Can be included only with clear justification

**4.3 Non-eligible costs and complementary funding**

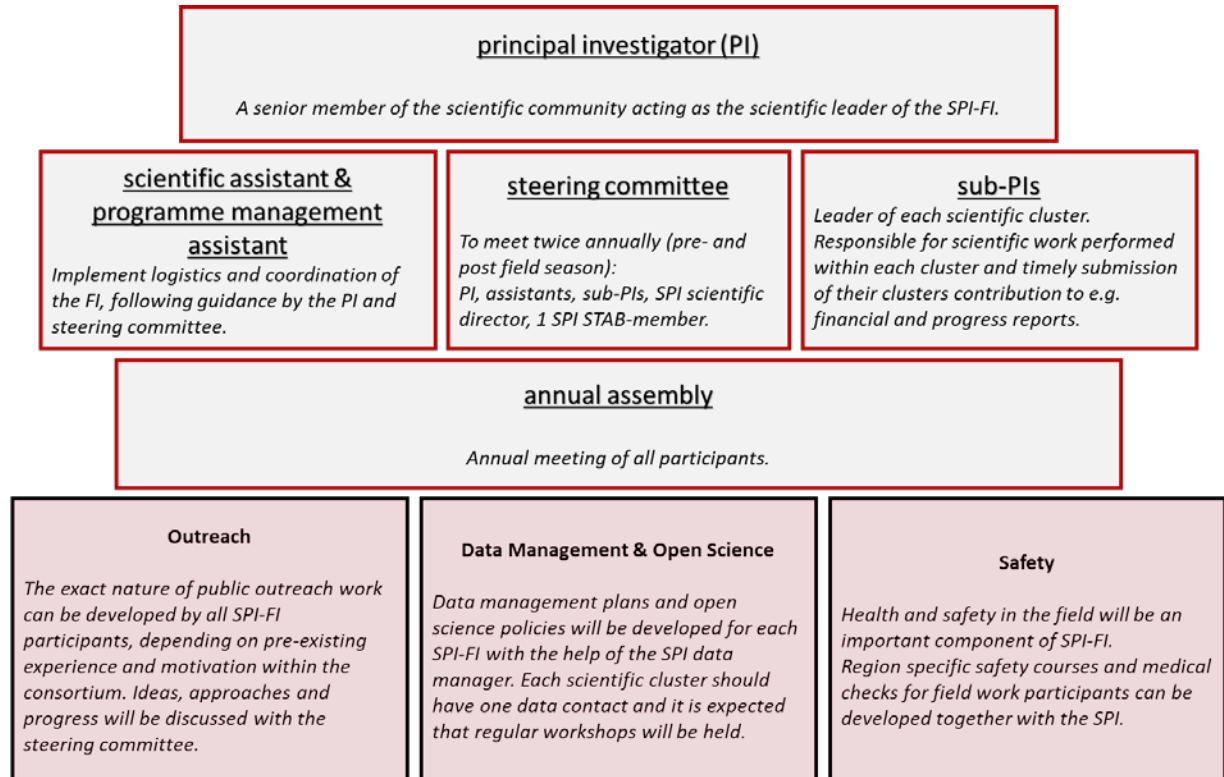
Non-eligible costs of SPI Flagship Initiative funding include any salaries (apart from the partial salary for a scientific assistant to the PI), and generally the costs for sample analysis and scientific equipment. The scientific work performed within a SPI Flagship Initiative thus relies on complementary funding such as Sinergia, other SNF grants, EU or third-party funding (such as private foundations or funds from own research institutions).

**4.4 Additional costs and services covered by the SPI**

The SPI will directly cover the salary of the SPI data manager, who will accompany all SPI Flagship Initiatives throughout their lifetime. Additional funding is also available to SPI Flagship Initiatives to develop and implement a robust data management and open science approach, fundamental to multi-disciplinary research (see also section 7). Additionally, the SPI will directly cover the salary of one part-time (50%) programme management assistant per SPI Flagship Initiative, based at the SPI (see also section 5.3).

## 5 Governance

The multi-annual and multi-disciplinary nature of SPI Flagship Initiatives necessitates robust coordination and a well-defined governance structure, outlined below.



### 5.1 Principal Investigator (PI)

The PI is the scientific director of the programme. She / He will be the lead author of the submitted proposal and, together with the steering committee, be responsible for making decisions throughout the programme's lifecycle. Acknowledging that such a role is a big commitment, the budget can include a partial salary for a scientific assistant working closely with the PI (a member of the research group), and a programme management assistant (based at the SPI). The PI will lead the logistics and coordination of the programme, and supervise the work of the scientific assistant and the programme management assistant.

More than likely, the PI will be part of one of the research cluster, however, it is her/ his responsibility to ensure equal opportunities for all research clusters and encourage close collaboration.

The PI is responsible for the timely submission of financial and progress reports, and holds the responsibility for ensuring that data management plans are updated in a timely manner.

### 5.2 Scientific assistant

Acknowledging that successful implementation of a multi-disciplinary programme involves a lot of

organizational work; the applicants' budget can cover a partial salary for a scientific assistant to the PI. The PI's scientific assistant will work closely with the programme management assistant, but likely have a stronger scientific background, i.e. be scientifically involved in the project.

The PI's scientific assistant will, for example, help arrange meetings and workshops at the appropriate times with the appropriate participants, work closely with the SPI data manager and all groups to ensure thorough data management, etc. The PI's scientific assistant might also be involved in coordinating the compilation of the initial FI proposal and the writing of proposals for complementary funding sources.

### **5.3 Programme management assistant**

The programme management assistant will be hired directly by the SPI (50% position) to support the PI with the logistical and administrative coordination of the SPI Flagship Initiative throughout its entire lifecycle. He / She will assist with the acquisition of necessary permits and the planning and implementation of field logistics, following guidance by the PI and steering committee.

Together with the PI and the PI's scientific assistant, the programme management assistant will encourage equal involvement and opportunity for all participants as well as multi-disciplinary work. They will likely be involved in the maintenance of the programme web page, assist with outreach projects, and can help to arrange the logistics of meetings and workshops.

### **5.4 Steering committee**

The steering committee will consist of the PI, the scientific assistant, the programme management assistant, a representative of each research cluster (sub-PI), the SPI scientific director, and one SPI-Science and Technology Advisory Board (STAB) member. The steering committee should meet twice a year, likely pre and post field season. The steering committee will discuss progress and challenges of the SPI Flagship Initiative and needs to approve, for example, the use of the opportunity fund.

### **5.5 Sub-PI (one per research cluster)**

Each research cluster will have one leading figure, a sub-PI to the SPI Flagship Initiative. The sub-PIs will be part of the steering committee and thus be involved in the overarching guidance and implementation of the programme. They will be responsible for the successful implementation of their cluster's research and should encourage multi-disciplinary approaches between research clusters. They need to ensure timely completion of their research cluster's data management plan, and the cluster's contributions to financial and progress reports.

### **5.6 Data contact (one per research cluster)**

Each research cluster will have one data contact, who will work closely with the SPI data manager to ensure a high-level of data management and open science approaches.

### **5.7 SPI data manager**

The SPI data manager will provide guidelines for data management and, together with the data contact of each research cluster and the sub-PIs, develop and assist with the implementation of a data management plan. While thorough data management and open science approaches are compulsory,

their exact nature and extent will be specific to each SPI Flagship Initiative. The SPI data manager will provide advice and guidance, and ultimately help to implement policies, which were developed and agreed on in a bottom-up approach. Data management workshops and meetings are envisioned to be an integral part of SPI Flagship Initiatives.

### **5.8 Participants**

Each participant will participate in relevant workshops, meetings, and safety training. Every programme participant is encouraged to actively develop and participate in public outreach projects. All participants will participate in the annual general assembly.

### **5.9 SPI secretariat**

The SPI secretariat will arrange the proposal and selection process, and is responsible for grant agreements and finances. The SPI Flagship Initiative will have to provide financial and progress reports to the SPI secretariat.

### **5.10 SPI STAB**

One SPI science and technology advisory board (STAB) member will be part of the steering committee of each SPI Flagship Initiative. The PI of each SPI Flagship Initiative will be expected to report at one STAB meeting each year.

## **6 Data management and open science**

Open science approaches and thorough data management will be fundamental to SPI Flagship Initiatives. Rather than merely providing an open science policy and data management guidelines, the SPI data manager will provide close support to SPI Flagship Initiative throughout their lifecycle. During the definition process of each SPI Flagship Initiative, data management needs will be discussed. These can include but are not limited to:

- Centralised data storage and data discovery to facilitate collaboration among the research clusters;
- Particular support needs of each research cluster to assist with good data management practice;
- Collaboration with the Swiss Data Science Centre.

Full reproducibility of research is key to open science. With this in mind, the expectation is that all data, code and publications will be made openly and freely available with a CC0 or CC BY 4.0 license (or equivalent for software) within a defined period of time. A data management plan and open science policy will be developed together with each SPI Flagship Initiative and must be adhered to by all participants.

## **7 Two-stage proposal process and evaluation**

SPI Flagship Initiatives will be tailored to the specific research needs of the Swiss polar science community and the process of their definition is designed to be bottom-up, driven by scientists and



supported by the SPI. In order to enable such a process and in parallel provide a framework that allows for continuous exchange (in terms of feasibility, scope, etc.) the call for proposals consists of several stages.

### **7.1 Call for pre-proposals**

The call for pre-proposals is open from 1 February 2021 until 23 April 2021. The application should be submitted through the SPI online application platform. The pre-proposal consists of a description of the overall programme and a short description of the scientific work proposed within each research cluster.

Only applicants (PIs) submitting a pre-proposal will be permitted to submit a full proposal.

Other aspects of a pre-proposal (research clusters, Sub-PIs, etc.) can change between the pre-proposal and proposal stage. The pre-proposal does include a preliminary budget, however, it is recognized that the budget of a final proposal is likely to change significantly with respect to the preliminary budget of the pre-proposal.

### **7.2 Information events**

Shortly after the opening of the call for pre-proposals, the SPI will hold 1-hour online events, where detailed information will be provided and potential applicants will be able to ask specific questions. The information events will be held online on 19 February 2021 and 26 February 2021.

If you would like to participate in one of these information events, please register on the [SPI event page](#).

### **7.3 Assessment of pre-proposals and recommendations**

An international panel of experts will read the pre-proposals and decide if the applicant is invited to submit a full proposal. For those applicants invited to submit a full proposal recommendations will be provided towards:

- 1) The possible addition of research clusters / topics to widen the scientific scope of the proposed program or synergies with other proposals (e.g. possible merging of proposals);
- 2) International linkages to be considered;
- 3) Recommendations towards the inclusion of indigenous and local peoples (if applicable), gender equality and diversity;
- 4) Recommendations towards logistical aspects;
- 5) Recommendations towards data management and open science strategy.

Expert recommendations will be provided to applicants by the end of May 2021. All applicants will be invited to a one-to-one feedback session with the SPI in early June, to discuss the recommendations and ask any unresolved questions regarding the preparation of the full proposal.

If several pre-proposals targeting the same or similar region are submitted, or if merging of two pre-proposals was recommended by the expert panel, applicants will be invited to participate in region-specific workshops, held in June 2021.

#### **7.4 Full proposal**

Full proposals will be due in October 2021 and reviewed by an international panel of experts. Evaluation criteria for the full proposal are:

- 1) The originality and quality of the science proposed;
- 2) The synergistic nature of the proposal (potential for innovative multi- to interdisciplinary science output, complementarity of proposed research consortium);
- 3) The impact on the international and national scientific landscape;
- 4) Quality and feasibility of proposed organization and management of the campaign (logistics, safety, experience of participants, maximization of added value achievable in a campaign with multiple field seasons);
- 5) Quality of proposed data management and open science approaches;
- 6) Quality and innovative aspects of outreach components;
- 7) Inclusion and involvement of indigenous and local peoples (where applicable), gender balance, and diversity.

#### **7.5 Announcement of selected proposals, grants and start of the programmes**

Results of the review process will be announced in mid-December 2021. The PI will sign a grant agreement with SPI and it is expected that a consortium agreement is signed with all sub-PIs. Dates for the official start and end date of each SPI Flagship Initiative will be defined in the grant agreement.

## **8 Appendix 1: Hypothetical example SPI Flagship Initiative**

In the following, we provide a purely hypothetical example of a possible SPI Flagship Initiative. In order to avoid any conflict of interest, a non-polar area was chosen. We provide this example to visualize how a SPI Flagship Initiative is envisioned to foster (but not force) multi-disciplinary research by management of logistical and safety components during a series of field campaigns as well as providing strong data management and public outreach support.

### **SPI Flagship Initiative: The lakes of Ounianga – a unique oasis ecosystem in the Sahara desert**

The lakes of Ounianga, located in the Sahara Desert of present-day NE Chad have existed for thousands of years withstanding dramatic climate change. The oasis consists of 18 lakes with a total surface of about 20 km<sup>2</sup>. The lakes exhibit a wide variety of sizes, depths, chemical compositions and colorations, with no other comparable stretches of open water exists within a radius of more than 800 km.

A vast reservoir of fossil ground water beneath the surface in this area constantly replenishes the water lost to evaporation, which is estimated to be in the order of 6 m a year, compared with less than 5 mm of annual precipitation.

The Ounianga freshwater system exists due to a unique combination of geological, hydrological, climatic and biological factors, which the Ounianga Flagship Initiative studies in an integrated approach. Well-coordinated field access to this remote and potentially dangerous field site over multiple years allows to collect data towards an understanding of the climatic past of the region and, in turn, the African monsoon system. An understanding of the climatic past of the region is furthermore deeply intertwined with human history, and the migration of the human race out of Africa. Data collected during the Ounianga Flagship Initiative furthermore allows a detailed investigation into the unique hydrology of the lake system in the present day. Additionally, the region provides immense potential for the study the adaptation to life under extreme conditions, on the molecular, organismal, and ecosystem level. The research efforts of the Ounianga Flagship Initiative are a necessary step of ensuring that this UNESCO heritage site will be preserved for the future.

#### **Research Cluster 1: Lake System Hydrology**

It is hypothesised that the Ounianga freshwater lake system exists and remains due to the vast fossil groundwater reserve; the specific position, morphology and orientation of the lake basin; continuous winds from a perpendicular direction; a source of aeolian sand; extreme evaporation through a central, hypersaline lake (the central evaporative pump); and the floating reed covers preventing evaporation from other lakes. Research cluster 1 is collecting data towards all these parameters, both during the field campaigns and by installing a range of autonomous sensors continuously collecting a range of e.g. meteorological data.

#### **Research Cluster 2: Paleoclimatology**

The focus of the second field season of the Ounianga Flagship Initiative is the collection of sediment

cores. It is thought that the sediment record of Lake Yoa extends back to 11,000 years ago. The cores will be analysed in the home laboratory in Switzerland with special emphasis on pollen records, which can provide crucial insight into past climatic conditions.

### **Research Cluster 3: Human history**

The climatic history of the region comprising the present day Sahara desert is crucially important in understanding early human civilizations. It is thought that until the end of the last ice age an arid and inhospitable Sahara region was the northern border of areas inhabited by Homo sapiens. Shifts in the monsoon system in the region led to a northward extension of the savannah, allowing human settlement in the region and the gradual movement into Europe and Asia. With the diminishing of monsoons in the region approx. 5000 years ago the desert returned, forcing humans to leave the area. It is thought that this migration initiated the rise of the advanced civilization of ancient Egypt.

Research Cluster 3 is performing archaeological research in the Ounianga and the nearby Ennedi Plateau, in particular during the first two field seasons. Once climatological data from the first sediment cores becomes available, the goal will be to link archaeological with paleo-climatological data.

### **Research Cluster 4: Improved numerical modelling of the African monsoon system**

Paleo-climatological information of the region, inferred from lake sediment cores, is invaluable in tracking past changes of the African monsoon system and understanding what is causing its regular shifts. The work of research cluster 4 is largely based on numerical modelling approaches. Crucially, such a modelling component will be considered in the planning of field campaigns, in order to maximize the applicability of acquired data for model parameterization.

### **Research Cluster 5: Ecophysiology and evolutionary history of life in the Ounianga lake region**

With the exception of the central, hyper-saline Lake Teli, the lakes of Ounianga are covered by thick mats of floating reed (*Eragrostis bipennata*) significantly reducing evaporation. These plants are crucial for the functioning of this ecosystem, and adapted to live under such extreme conditions. The floating reed receives nutrients from aeolian dust, and one hypothesis to be tested by research cluster 5 is the special symbiotic relationships between the reed and its microbiome, which is expected to enable the use of such nutrients.

The reed as well as several species of fish and gastropods to be found in the lakes have been genetically isolated from related species since the savannah of northern Chad dried up over 3000 years ago. They thus represent an incredible opportunity to study evolution on a genetic, molecular, organismal, and eco-physiological level.

### **Research Cluster 6: Behavioural ecology of birds of the Ounianga**

The central, hypersaline lakes of Ounianga have salt concentrations about 6 times higher than what can be found in the oceans. It is anecdotally known that several species of birds in the region developed special physiological and behavioural adaptations to thrive under such conditions, being able to feed off the layer of algae which forms at the hyper-saline lakes surface and frequently visiting the fresh water lakes to clean their feathers of the salt. The study of such behavioural adaptations in birds has potential

applications in the field of cognitive neuroscience.

**Research Cluster 7: Social-ecological development of the region**

An understanding of how social and ecological system co-evolve through time is important for modelling, and anticipating the current and future ecological status of lakes ecosystems like the Ounianga. The Ounianga lake system is clearly of fundamental importance to the livelihoods of present day local communities, however, past and present-day anthropogenic pressures, and the timing and interaction between social, economic and ecological feedbacks governing the dynamics of the ecosystem have never been addressed formally. Research cluster 7 is working closely with local communities in the two villages Ounianga Kebir (approx. 9000 inhabitants) and Ounianga Serir (approx. 1000 inhabitants) to study their past and present interactions with the lakes.

In this example, the SPI Flagship Initiative has seven research clusters. In the conceptual diagram we show five. No specific number of research clusters is assigned, a priori, as the ideal number will clearly depend on the programme. For the most part, we anticipate that a research cluster corresponds to a research group, with some additional national and international collaborators. The term research “cluster” was chosen to emphasize that different research groups can be represented in each research cluster.

It is encouraged that the research clusters of a SPI Flagship Initiative span a wide range of topics, including non-natural sciences research fields. However, this is not compulsory, in particular not during the pre-proposal stage.

Similarly, multi-disciplinary research linking the different research clusters is desirable, however, sometimes it is just not possible. If one research cluster profits highly from access to the field site but their research does not link well with the other research clusters, it can still be part of the SPI Flagship Initiative.

**Principal Investigator (PI)**

The PI of the Ounianga Flagship Initiative is also the head of the research group which leads research cluster 2. They are familiar with the region, having conducted fieldwork there in the past. This provides them with the necessary knowledge to judge what would and would not be feasible for the fieldwork requirements of the additional research clusters. The great amount of work required from the PI in terms of coordinating such a large and diverse Ounianga Flagship Initiative is supported by a research technician from his lab, who is receiving a partial salary through SPI Flagship Initiative funding.

**Programme management assistant**

The project management assistant for the Ounianga Flagship Initiative is working very closely with the PI and the PI’s scientific assistant, the sub-PIs of the individual research clusters, the SPI data manager and local authorities in Chad to coordinate the many logistical and safety issues inevitably arising during fieldwork in the region. Under supervision of the PI, they are leading the application process for all required permits and are helping to implement the Flagship Initiative’s core values of open science approaches and a strong public outreach component.

A Flagship Initiative project management assistant will be employed at 50% by SPI. Their salary is not part of the budget applied for by potential PIs in their SPI Flagship Initiative proposal. The person taking this role can be suggested by the applicant.

The exact role and responsibilities of the programme management assistant depend on the exact nature of the SPI Flagship Initiative, but is likely to involve logistical (e.g. permit application, coordination of medical checks, etc.) and outreach (e.g. maintenance of website) aspects.

The roles of the programme management assistant and scientific assistant are to support the PI, who in turn is responsible for co-ordinating their work and adjusting their work load, if necessary.

### **Logistics**

In the case of the Ounianga Flagship Initiative, a large part of the budget is required to ensure safe and coordinated field access. The Ounianga lakes are located 1,200 km of desert tracks from the capital N'Djamena. Transport of personnel and equipment is therefore a big logistical challenge. Furthermore, there are numerous logistical challenges including multi-day expeditions by camel for archaeological work in the nearby Ennedi plateau and the transport and assembly of a small drilling platform on Lake Yoa.

The major part of the budget for a SPI Flagship Initiative is available for the cost of logistics necessary to enable fieldwork in remote and hostile environments. While the required budget for such logistics will obviously have to be outlined and itemized in the proposal, adjustments and improvements can be (and potentially have to be) made throughout the lifecycle of the Flagship Initiative. The PI, sub-PIs, scientific assistant and programme management assistant will work in close collaboration to optimize logistical aspects, which will also be discussed with and approved by the steering committee on a regular basis.

### **Safety**

For the Ounianga Flagship Initiative close contact with local authorities is paramount to ensure safe working conditions in a politically unstable region. Furthermore, all field work participants have to undergo a medical check and safety training, ensuring that they are aware of the risks they take despite stringent safety measures, that they have all the required immunizations, and are physically fit to work under harsh conditions.

Safety is a key component of the SPI Flagship Initiatives. The programme management assistant, in close collaboration with the PI, will help to arrange and implement medical checks and safety training for all field work participants. Depending on the exact nature of the SPI Flagship Initiative, local guides and guards might be necessary to ensure safe working conditions.

### **Data Management**

Good data management is essential for a multi-annual and multi-disciplinary programme such as the Ounianga Flagship Initiative. Workshops with dedicated data contacts of each research cluster and the SPI data manager are held at regular intervals. Data management plans are updated at regular intervals, and all data, code, and publications are being made openly and freely available.

During the Ounianga Flagship Initiative, several large datasets are being acquired which will hopefully help to discover empirical relationship between, for example, physical properties which shape the environment (of e.g. a specific lake) and their manifestation in biological adaptations (e.g. meta-transcriptomics). In order to enable the linkage of results from such different scientific disciplines, all data collected is stored and made available to programme participants on a centralized data storage and discovery platform throughout the lifetime of the Flagship Initiative and for a determined period of time afterwards.

Thorough data management will be fundamental to SPI Flagship Initiatives. Rather than merely providing data management guidelines and data management plans, the SPI Data Manager will provide close support to all groups involved in each SPI Flagship Initiative. Given the importance of data management and accessibility in enabling multi-disciplinary research, the establishment of a centralized data storage and discovery platform and collaboration with the Swiss Data Science Centre will be discussed during the definition process of each SPI Flagship Initiative.

The expectation is that data, code and publications will be made openly and freely available with a CC0 or CC BY 4.0 license (or equivalent for software) within a defined period of time.

### **Public outreach**

The Ounianga Flagship Initiative has a strong public outreach component, making their research available and understandable for the wider public in Switzerland as well as for the local communities in Chad. It is planned to organize a photography expedition about the fieldwork in Chad, which will be accompanied by events during which scientists involved will talk about their experiences and science. The Ounianga Flagship Initiative is working closely with the Swiss Desert Class, creating new content for this SPI-led educational programme. A project website is maintained to increase the visibility of the programme to the wider public as well as potential international collaborators.

### **Partnerships and international collaboration**

The Ounianga Flagship Initiative is collaborating closely with the French Institute of Desert Sciences which has recently set up a monitoring platform on the Western part of the region. Furthermore, all relevant data from research clusters 1 and 4 will be inserted into the IOMN (International Ounianga Monitoring Network). Close collaboration has furthermore been established with the Swiss Development Agency and its regional branches.

### **Timeline of programme**

The Ounianga Flagship Initiative has an official duration of 4 years (1 March 2022 - 1 March 2026) and consists of three field seasons. Each field season has a different focus, while core measurements from all research clusters are acquired during all field seasons.

Before and after each field season a programme meeting (steering committee) is organised. The steering committee consist of the PI, a sub-PI from each research cluster, the PIs assistant and the programme management assistant, the SPI scientific director and one SPI STAB member.

Field safety workshops are being held before each field season.

