Implementing CBMP at INTERACT stations: The case of Rif Field Station

From proposal and planning to actual progress?

CAFF Conservation of Arctic Flora and Fauna

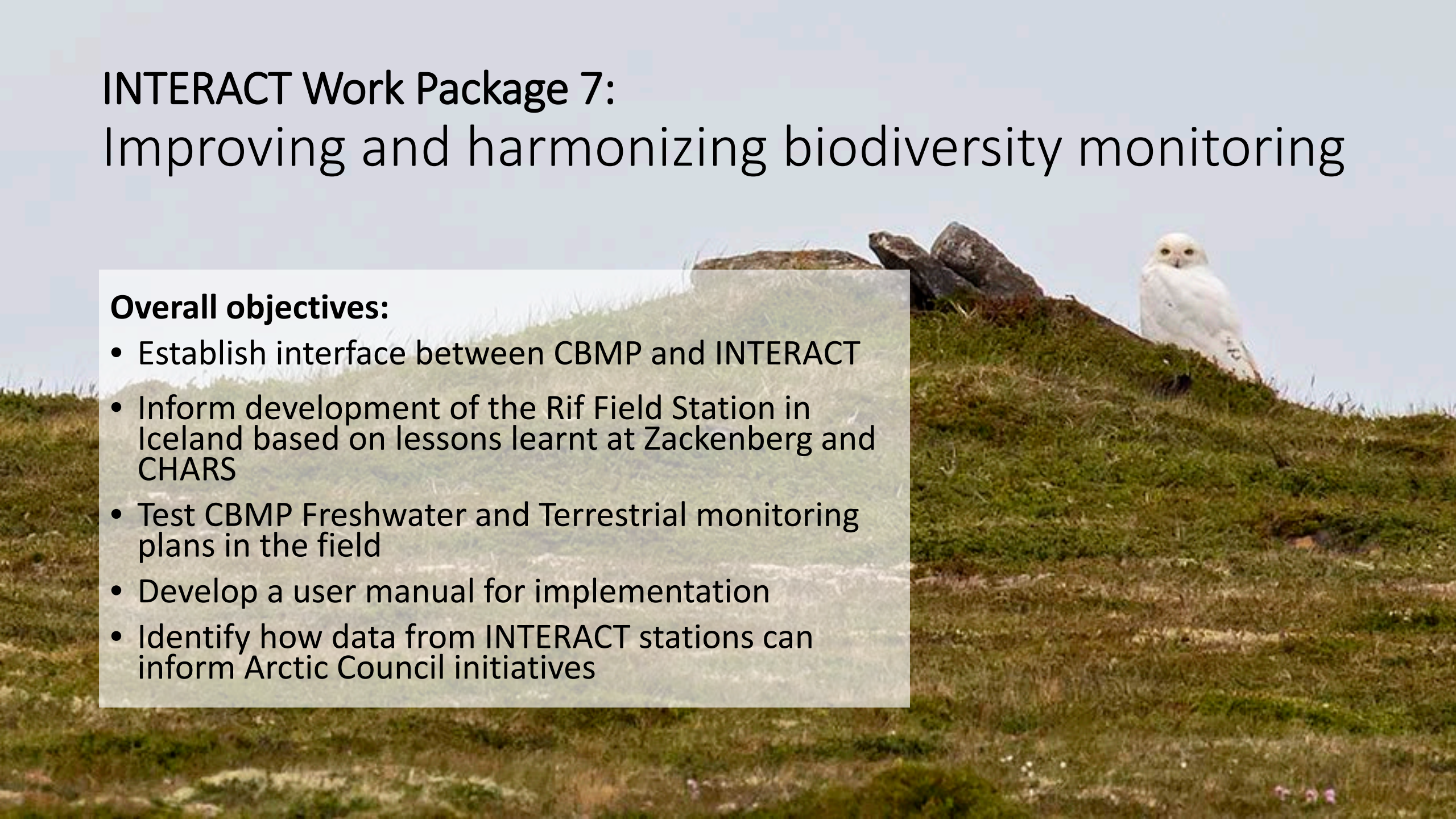
RIF Field Station

AARHUS UNIVERSITY

INTERACT

CIRCUMPOLAR BIODIVERSITY MONITORING PROGRAM

INTERACT Work Package 7:
Improving and harmonizing biodiversity monitoring



Overall objectives:

- Establish interface between CBMP and INTERACT
- Inform development of the Rif Field Station in Iceland based on lessons learnt at Zackenberg and CHARS
- Test CBMP Freshwater and Terrestrial monitoring plans in the field
- Develop a user manual for implementation
- Identify how data from INTERACT stations can inform Arctic Council initiatives

Arctic Council

- The Ottawa Declaration (1996) formally established the Arctic Council as a high level intergovernmental forum
- Promotes cooperation, coordination and interaction among Arctic states with involvement from Arctic indigenous peoples organizations and other Arctic inhabitants
- Focus on issues of sustainable development and environmental protection
- Consensus based body

Conservation of Arctic Flora and Fauna (CAFF)

- Biodiversity Working Group of the Arctic Council
- Board members from eight Arctic countries six Indigenous organizations
- Observers from non Arctic countries, international organizations

- Mandate:
  - to address the conservation of Arctic biodiversity, and to communicate its findings to the governments and residents of the Arctic, helping to promote practices which ensure the sustainability of the Arctic's living resources

Arctic Biodiversity Monitoring Efforts

- Limitations:
  - Uncoordinated efforts operating in isolation
  - Lack long term committment and funding
  - Inaccessible information
  - Lacking link to decission makers and local communities

- Shortcomings lead to:
  - Lack of circumpolar perspective
  - Incomplete coverage
  - Limited ability to detect change
  - Reduced ability to inform policy makers

- CBMP is implementing better coordinated monitoring, harmonization of data, communication. Local involvement is important part in the implementation.

What is the CBMP?

Circumpolar Biodiversity Monitoring Program (CBMP)

- Coordinated Arctic monitoring
- International network of networks, monitoring, understanding and reporting Arctic biodiversity trends
- Focal point for current and credible Arctic biodiversity information

www.cbmp.is

www.ABDS.is

CBMP structure

CAFF Board
8 Arctic States
6 Permanent Participants organization

CBMP Coordination Committee & Technical Team. (DK / GL, US, CAFF sec).

Terrestrial-SG
(Iceland/ Sweden)

Expert networks

Freshwater-SG
(Canada / Sweden)

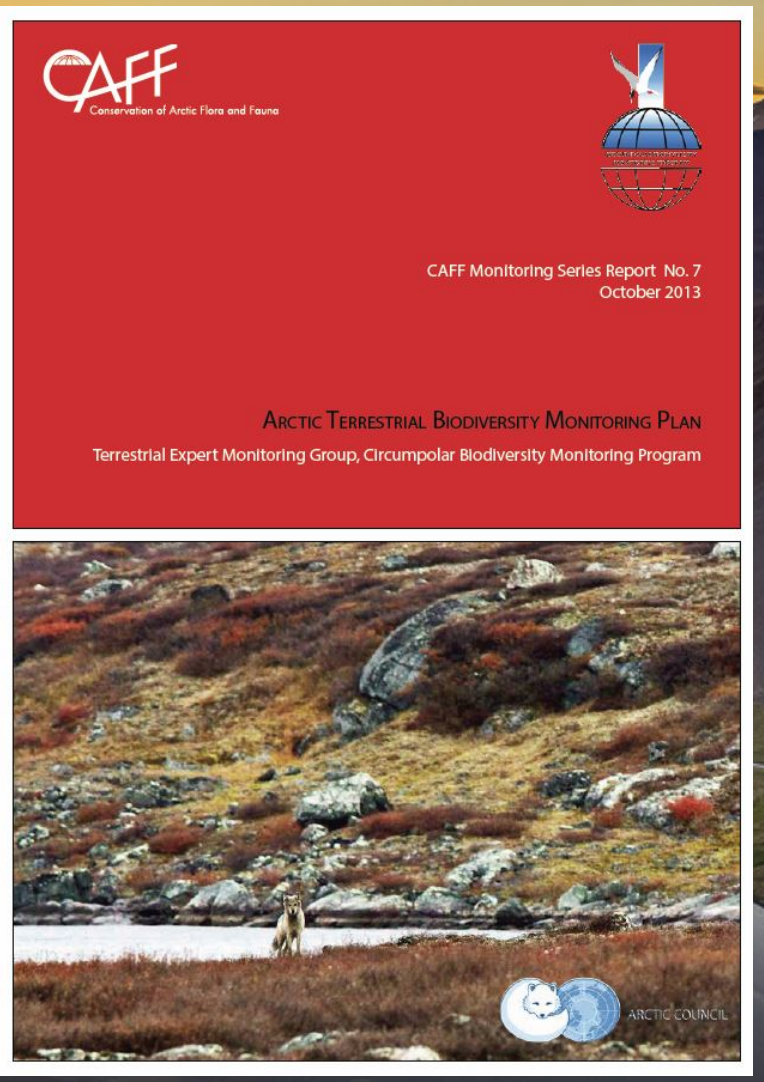
Expert networks

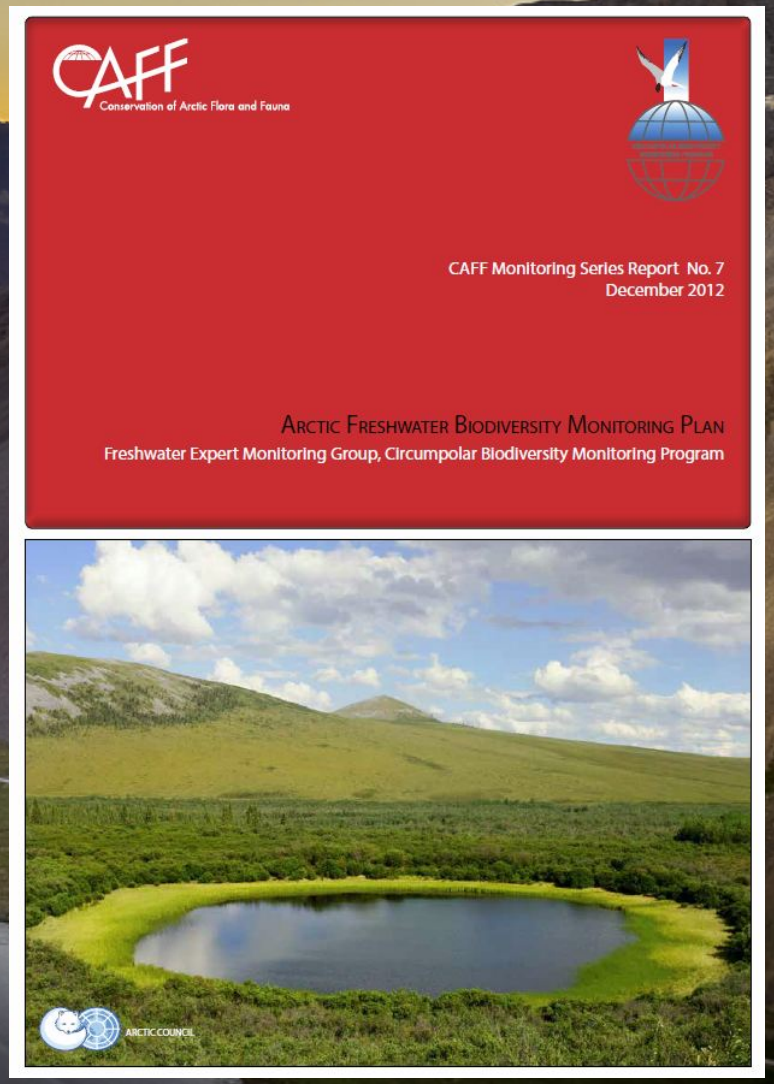
Coastal Expert Monitoring Group
(US/ Canada)

Marine SG
(Denmark/ Canada)

Expert networks

Freshwater and Terrestrial Monitoring Plan

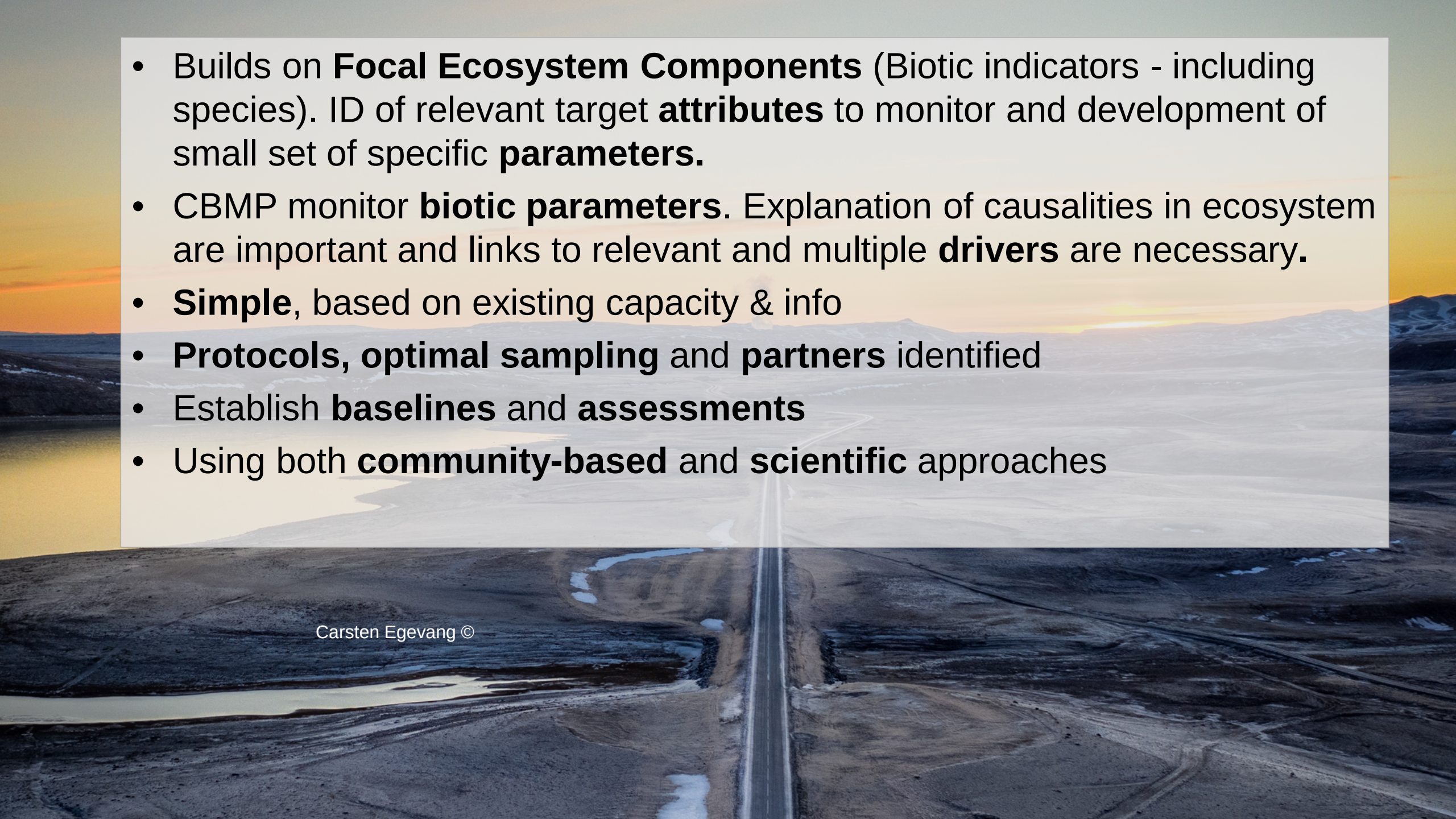




The CBMP Expert Monitoring Groups have developed the Arctic Biodiversity Monitoring Plans as the framework for coordinated, long-term Arctic terrestrial biodiversity monitoring and provide guidance on;

- Scope and focal area
- Overview of monitoring approach, objectives, general methods and sampling design
- Data collection and methods
- Data management framework

- Builds on **Focal Ecosystem Components** (Biotic indicators - including species). ID of relevant target **attributes** to monitor and development of small set of specific **parameters.**
- CBMP monitor **biotic parameters**. Explanation of causalities in ecosystem are important and links to relevant and multiple **drivers** are necessary**.**
- **Simple**, based on existing capacity & info
- **Protocols, optimal sampling** and **partners** identified
- Establish **baselines** and **assessments**
- Using both **community-based** and **scientific** approaches



Terrestrial FEC‘s

- Vegetation
  - All species
  - Invasive species
  - Rare species, species of concern
  - Food Species
- Birds
  - Herbivores
  - Insectivores
  - Carnivorous
  - Omnivores
  - Piscivorous
- Mammals
  - Large Herbivores
  - Medium sized herbivores
  - Small herbivores
  - Large predators
  - Medium sized predators
  - Small predators

Freshwater: FEC‘s

Biotic:

Fish

Benthic inverterbrates

Zooplankton

Benthic algae

Phytoplankton

Macrophytes

Riparian vegetation

Aquatic birds

Abiotic:

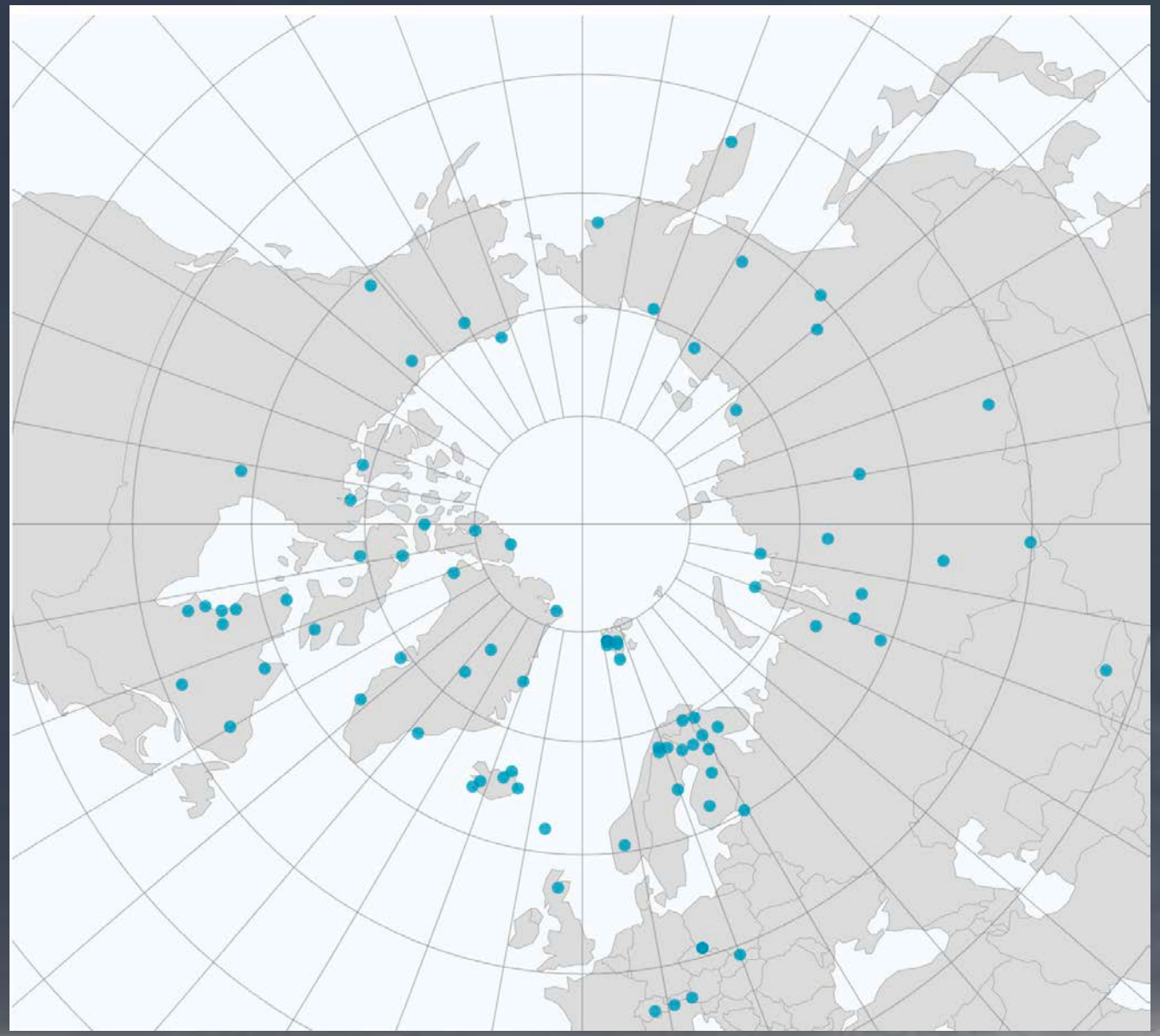
Water temperature regime

Hydrologic and ice regimes

Water quality

Climatic regime

Permafrost

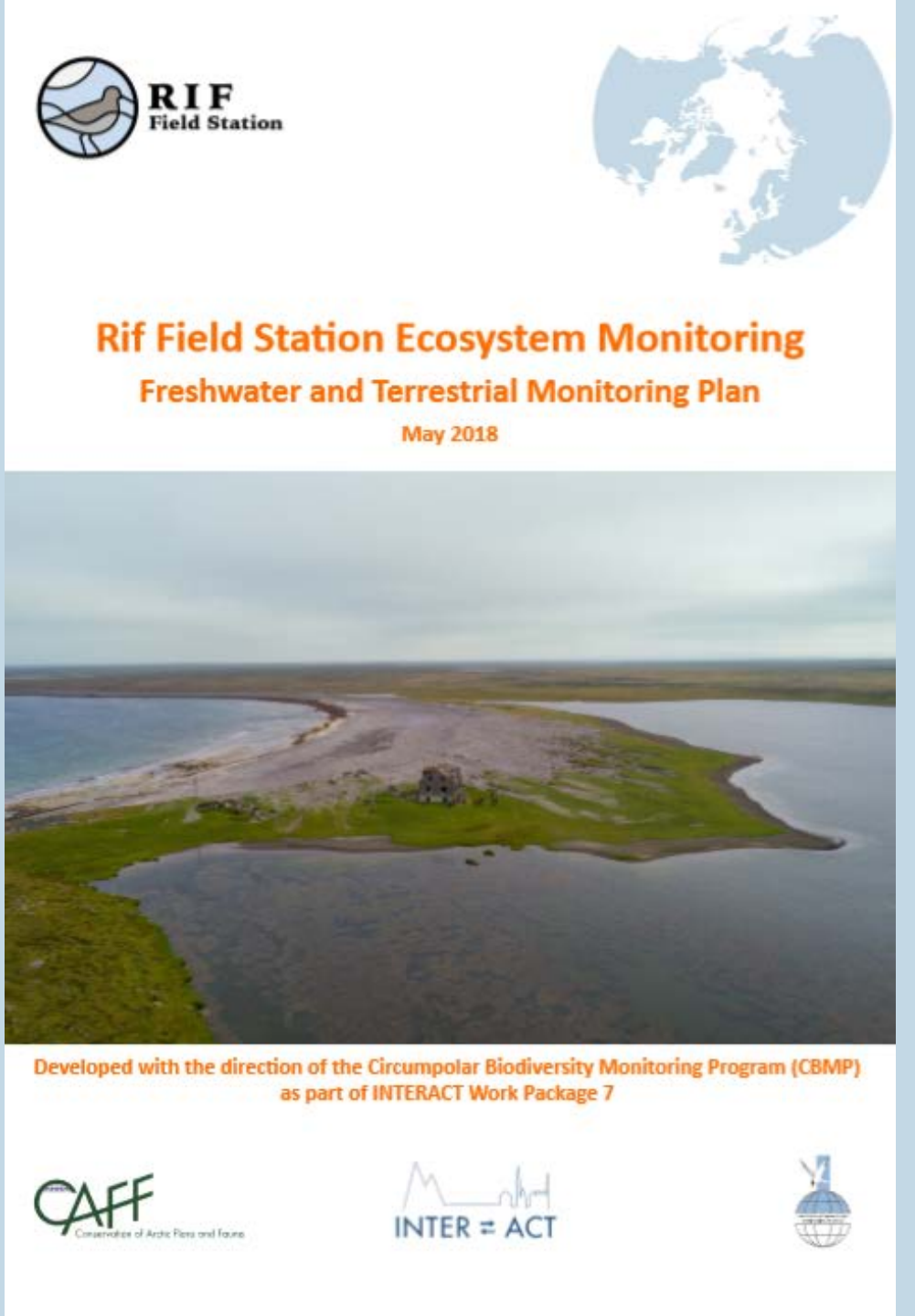


INTERACT

- 86 terrestrial field bases
- Endless opportunity

WP7 deliverables

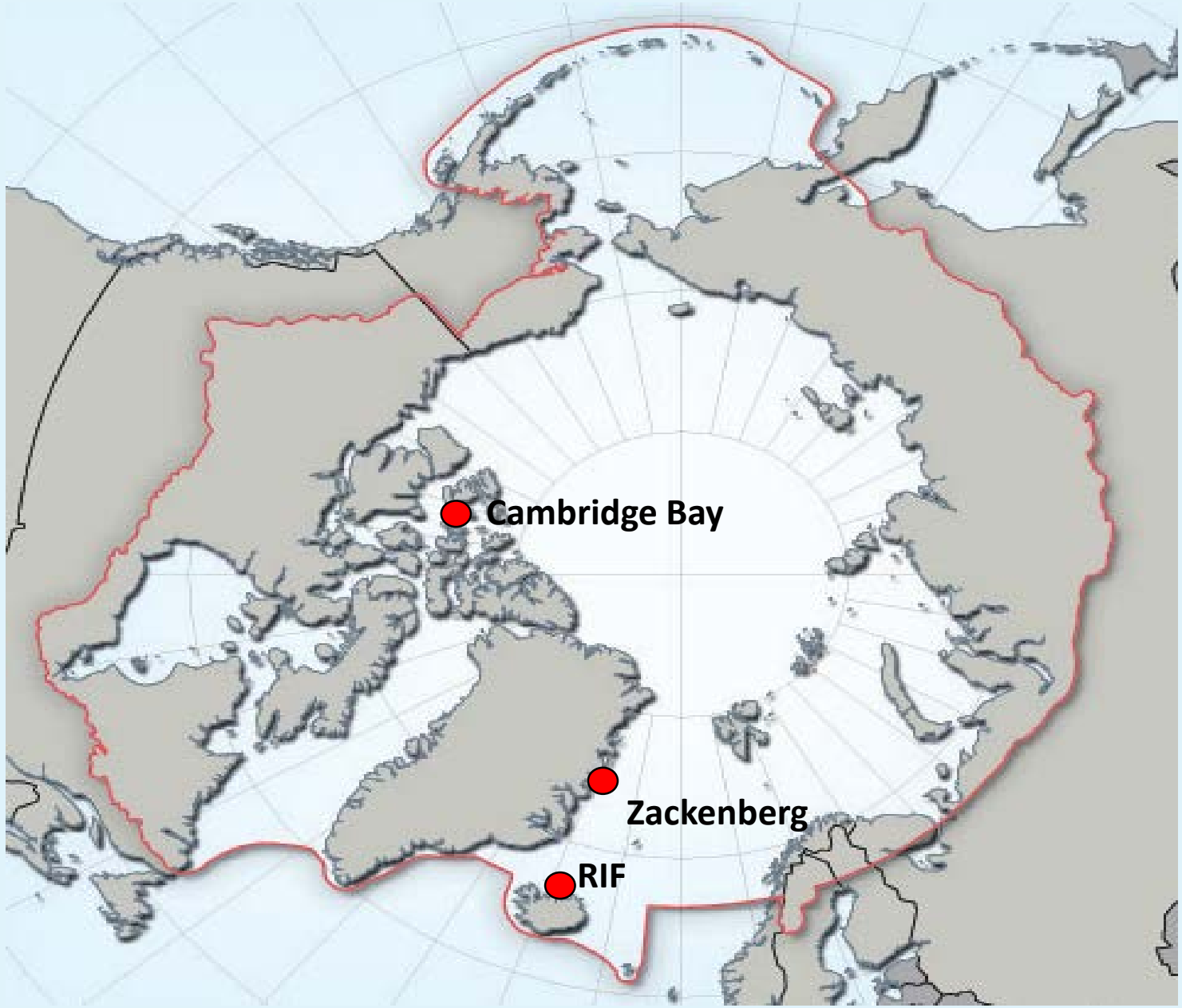
- Rif Field Station's monitoring plan
  - Terrestrial and freshwater - based on CBMP
- Data management plan for Rif
  - Ensures FEC data collected is documented, accessible and preserved via the ABDS
- User manual for implementing CBMP at INTERACT stations
- Report: Flow of data from field to AC assessments, monitoring and reporting activites



The WP7 team:

- CAFF (team leader)
- Aarhus University
- Three reference stations:
  - Rif Field Station, Iceland
  - Zackenberg, Greenland
  - CHARS, Canada

- Different latitude, resource base and level of establishment



Why Rif Field Station?

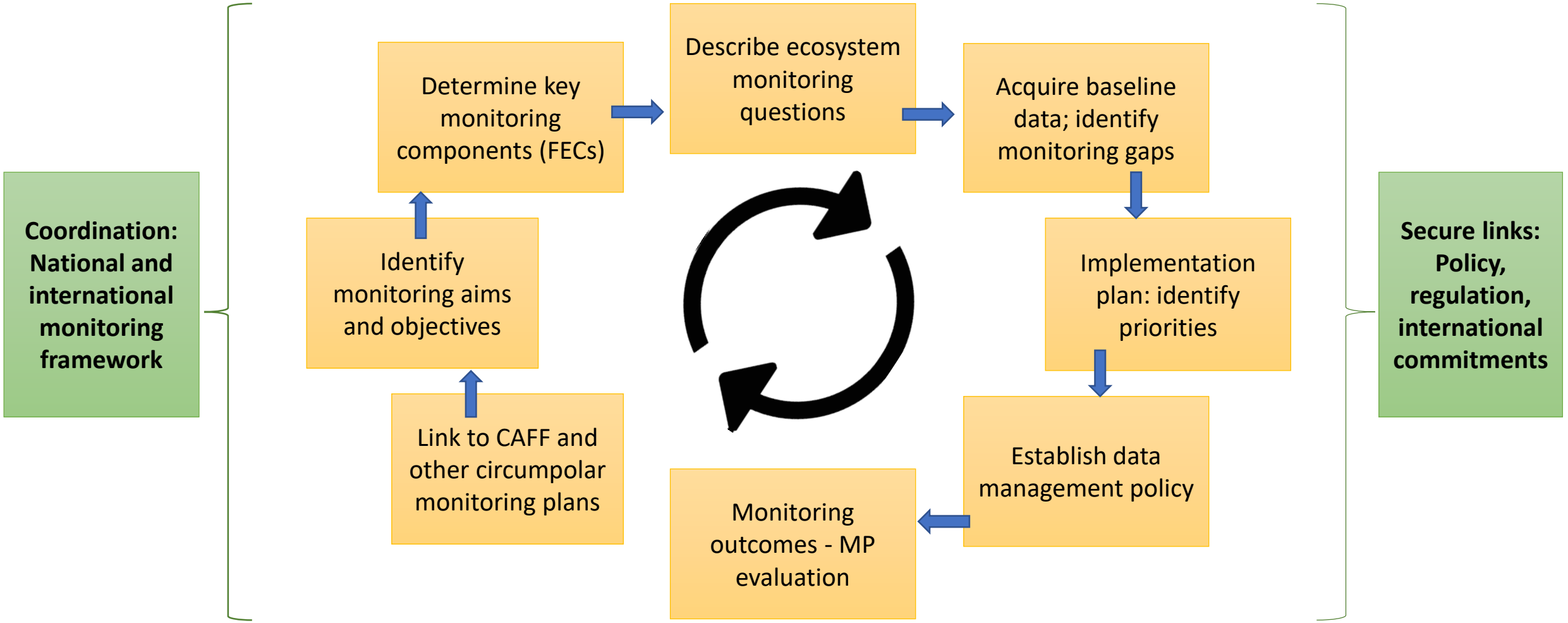
- Environmental characteristics:
  - Low Arctic and easily accessible
  - Abundant freshwater
  - Rich coastline
  - Important bird area
- Fairly new station
  - Little established monitoring
  - Perfect as a ‘model station’ for testing the CBMP implementation process

Towards monitoring plan and data management

- Three monitoring workshops:
  - Raufarhöfn, August 2017
  - Copenhagen, April 2018
  - Raufarhöfn, June 2019
- Data management workshop:
  - Akureyri, August 2018

Pilot phase:

Developing a monitoring plan (MP)



FEC selection at the Rif site

Freshwater

Biotic (lakes and rivers)

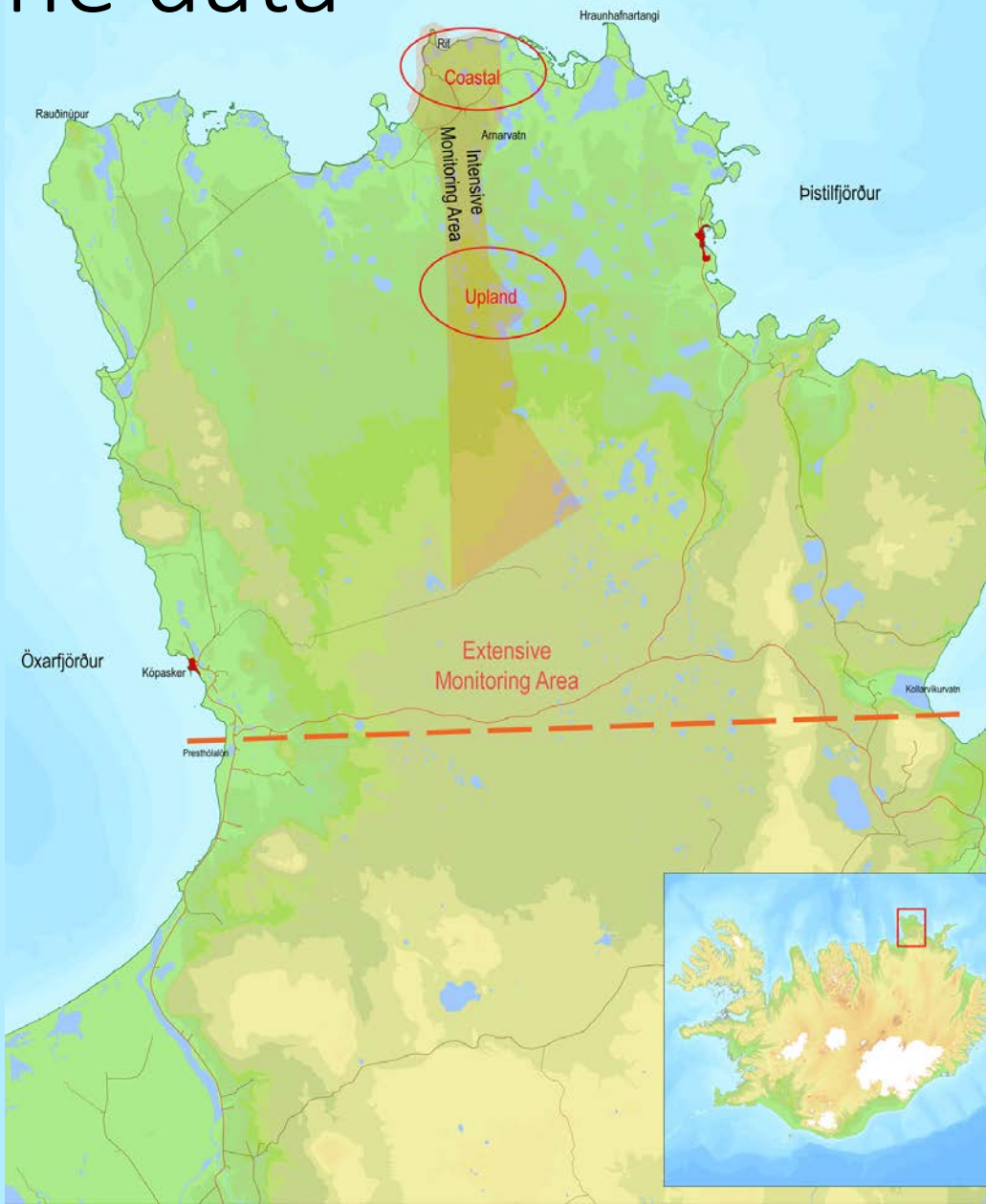
- Zoo plankton
- Phytoplankton
- Zoo benthos
- Phyto benthos
- Fish

Abiotic

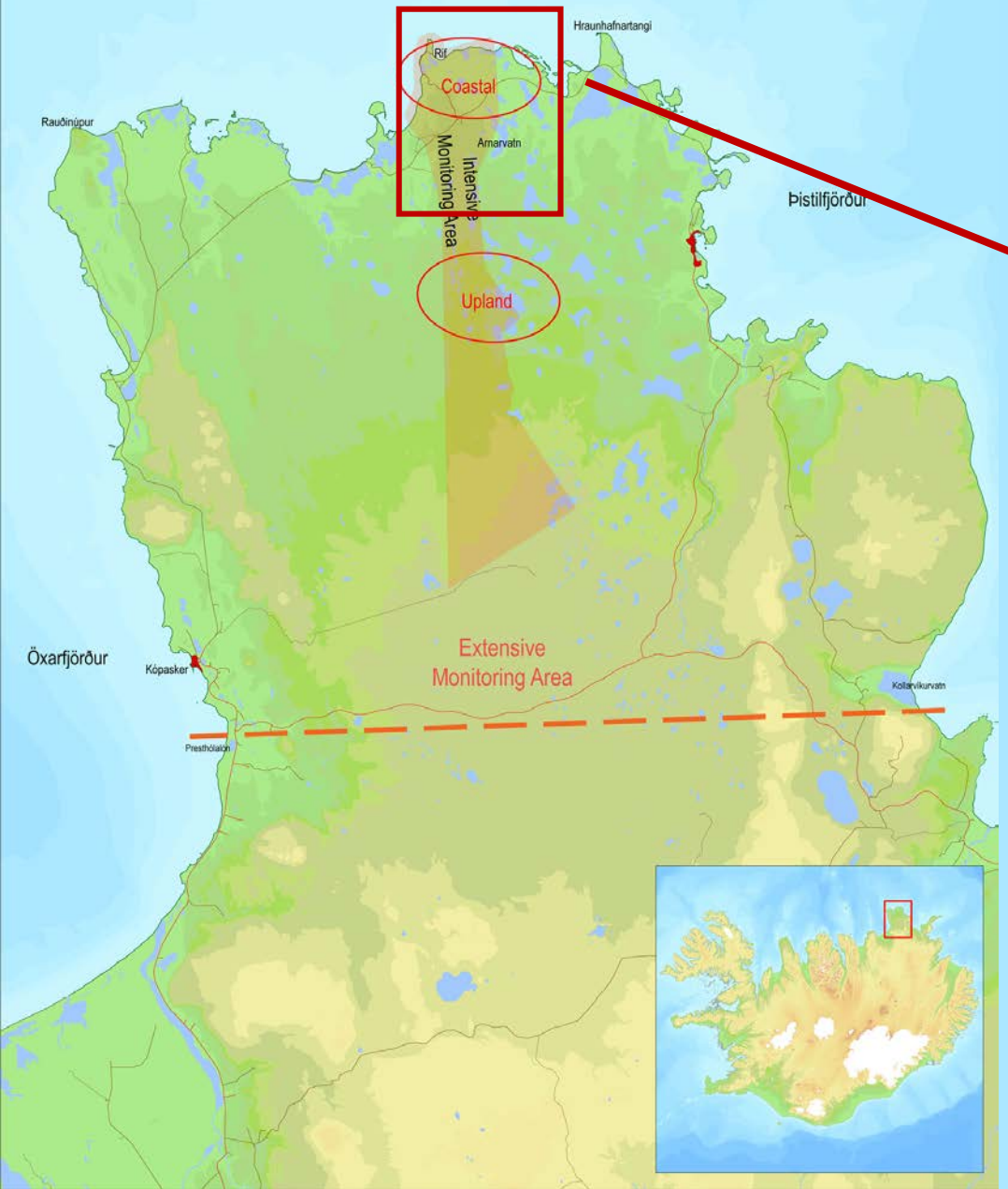
- Water temperature regimes
- Hydrological and ice regimes
- Water quality
- Climatic regime
- Active layer

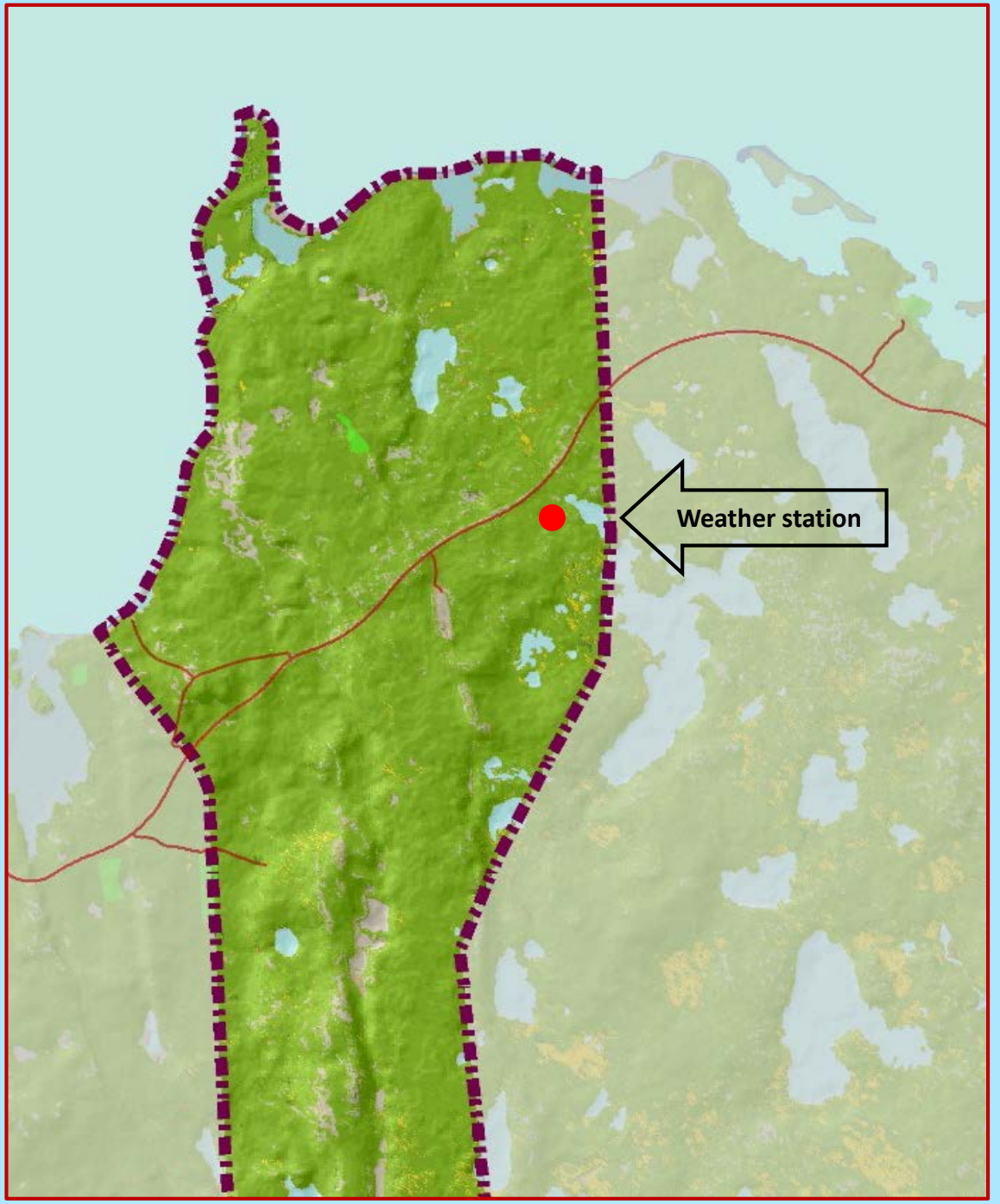
Starting up: Gathering baseline data

- Defining the extensive and intensive monitoring area
- Building links and forming partnerships
- Change analysis through remote sensing:
  - Data from 2000 to 2017
  - Significant trend in:
    - Land surface temperature: decline by 0.23°C/year in December
    - Increase in NDVI and EVI = Greening



Abiotic factors: Climate station





Data Management Plan for the Rif Field Station

- Describes principles and guidelines for management of data and information generated at RIF.
- Priorities;
  - Long term preservation
  - Timely access to datasets
  - Discoverability

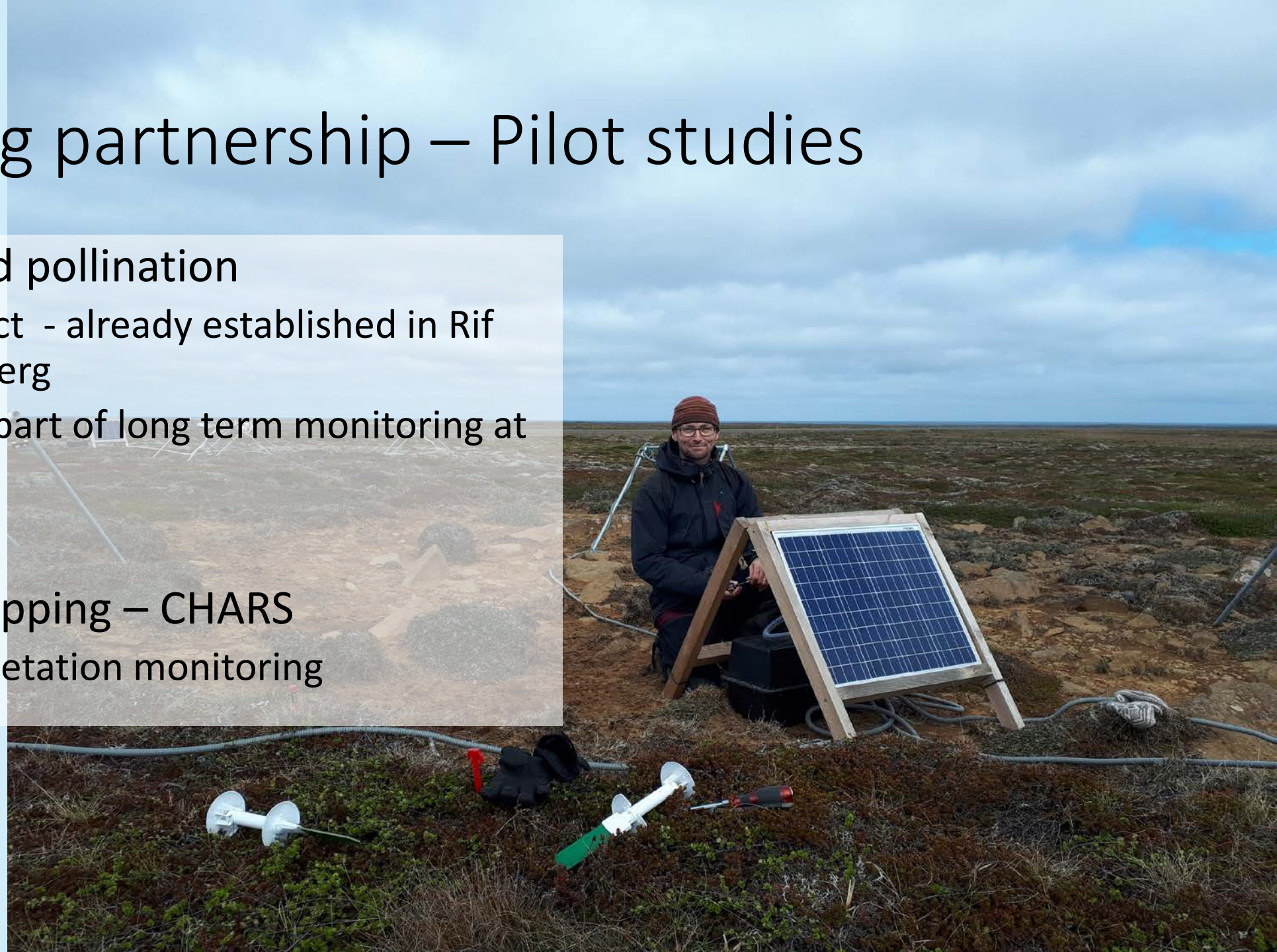
Benefits/importance of WP7

- At Rif:
  - Strengthens the argument of Rif as a key site for Arctic research in Iceland
  - Improved data management
  - Facilitation of permanent partnerships and synergistic effects with other monitoring institutions and projects
  - Addresses gaps in Iceland's monitoring commitments in light of international agreements
  - Important base for future research

- For CBMP and Arctic Council
  - Opportunity to test the monitoring plans in the field.
  - Generates user manual for implementation at Interact stations- that also can be applied in a broader application
  - Works toward coordination and more rapid assessments for policy makers

Monitoring partnership – Pilot studies

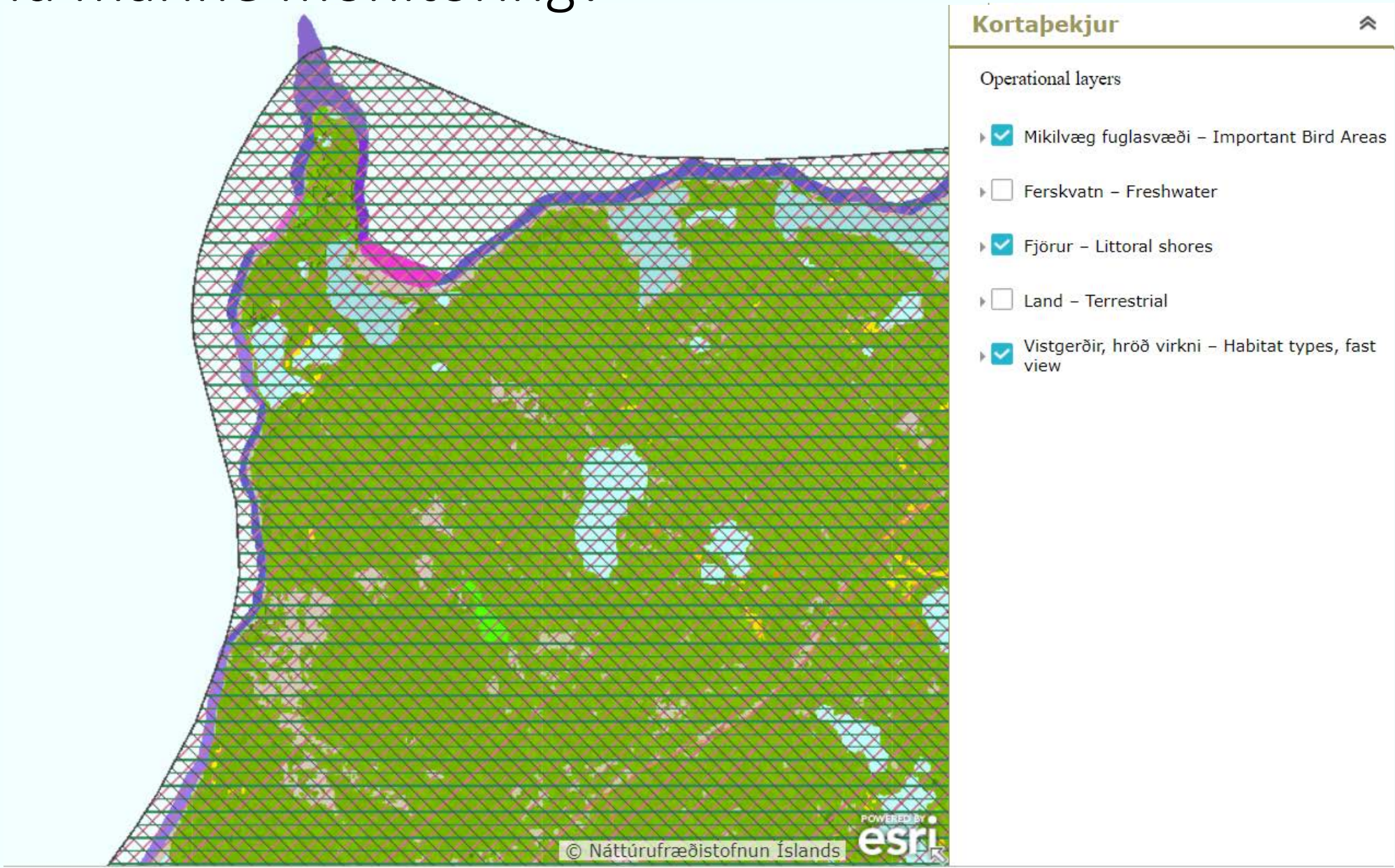
- Phenology and pollination
  - BitCue project - already established in Rif and Zackenberg
  - Intended as part of long term monitoring at Rif
- Barcoding
- Ecosystem mapping – CHARS
  - Focus on vegetation monitoring



Lesson's learned

- Importance of consistent funding:
  - CHARS vs. Rif Field Station
  - Monitoring vs. short term research
- Account for user's perspective
  - Usefulness for national and international monitoring partners
- A holistic approach:
  - Account for marine and coastal
  - Include socio-economic factors
- Acquiring data continues to be a challenge

The way forward for Rif field station:
Coastal and marine monitoring?



Next steps of WP7

- Flow of data to Arctic council assessments:
  - Finalize report
- User manual:
  - In website format
  - Details the specific steps and components involved in implementing CBMP at INTERACT stations