



Forel Heritage Association

Activity Report

2024

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Forel Heritage Association - Activity Report 2024

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Foreword

Acquired in 2022 by the Swiss Polar Foundation (SPF), the sailing yacht Paratii-2 was sailed from Brazil to Europe, arriving on January 3, 2023, in Brest. After a brief review of the activities carried out during 2023, this report presents the various activities carried out in 2024, with a focus on the boat's conversion work carried out in Lorient (France) and the expeditions to Greenland during the summer of 2024.

At the same time, this report presents the numerous actions undertaken in terms of communication and outreach, with the broader aim of reaching a wide audience about the challenges of climate change. This communication also involves interactions and exchanges with local Greenlandic communities, who are directly affected by these upheavals.

To create the necessary framework for the implementation of the FOREL project, this report also presents the various actions that were carried out during 2024 at the administrative level, in particular the creation of the Forel Heritage Association and the registration of FOREL under the Swiss flag, reflecting its Swiss roots.

All these steps would not have been possible without the generous support of numerous partners and donors, to whom the Association would like to express its gratitude.



PART I

**From PARATII-2 to FOREL:
a new research
platform**

1. The importance of coastal polar research

The increased sensitivity of the poles to climatic and anthropogenic changes is now widely recognized. These are associated with a wide range of effects, notably on pollution and biodiversity, leading to profound disruptions in the functioning of entire ecosystems. Despite this, most of these changes and their consequences have yet to be scientifically characterized. To do this, it is essential to be able to travel to the places where these profound changes can be observed, in order to acquire a solid understanding of these extreme ecosystems and conduct relevant thematic studies.

Unlike Antarctica, the Arctic zone is heavily impacted by pollution and exchanges between the ocean and continental margins, rivers and glaciers. These exchanges are also a source of nutrients, which are key to maintaining biodiversity and fishing activities. Coastal regions are therefore particularly affected by these changes, and the retreat of glaciers and permafrost further accentuates them, contributing to coastal erosion.

Alongside the expeditions carried out on large research vessels, the need to access areas closer to the coast and inaccessible to larger units has gradually emerged. It was in this context that expeditions with the sailing vessel ATKA were launched (2018, 2019), and the project to develop a Swiss platform for polar oceanographic research was born.

2. From PARATII-2 to FOREL

The SPF – Swiss Polar Foundation launched the project for a new oceanographic research platform for Swiss polar science in **July 2019**. The main features and specifications were defined before launching the conception and design process for a new vessel. In parallel, a scientific program was drawn up with the involvement of several Swiss scientists (**September 2019 to February 2020**).

In **2020**, the SPF Board confirmed its intention to pursue the development of the Forel project, but it was decided to postpone the construction of a new boat, mainly for cost reasons. The search for an existing vessel soon led to the identification of PARATII-2, a 29 m aluminum-hulled sailboat built in the 2000s by architects Bouvet and Petit. The owner, Brazilian explorer Amyr Klink, had sailed this polar expedition yacht on numerous occasions in Antarctica and the Arctic. The boat had therefore already proved its worth as a polar expedition vessel and presented itself as the ideal candidate for the creation of a Swiss platform for polar scientific research.

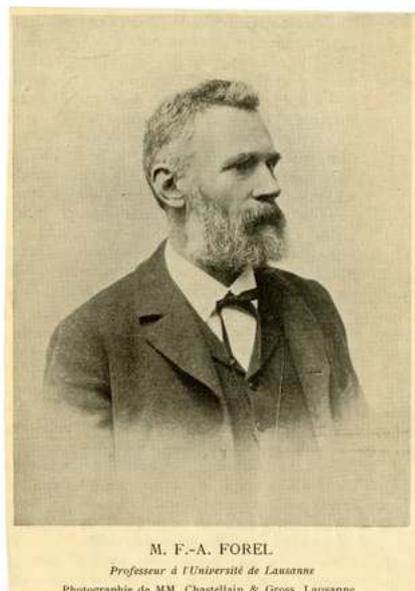


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Following an analysis of the boat's blueprints, it was decided to refit the PARATII-2 to enable it to fulfill its mission as a research platform. It was thus decided to create around 40 m² of laboratory space in the aft section of the boat, to enable scientists to carry out the initial processing and analysis of the samples collected.

In early **November 2020**, a small delegation from the Forel team travelled to Brazil to complete the technical evaluation of the boat. This confirmed the boat's excellent suitability for carrying out the defined scientific program. However, due to legal proceedings launched in Brazil at the end of **2020**, the project had to be put on hold until this dispute was resolved. Finally, in **September 2022**, SPF became the owner of the boat.

Very early on in the project, it was decided to name the boat "FOREL" in homage to François-Alphonse Forel, world-renowned as a pioneer in the study of lakes and founding father of limnology, a new science invented at the beginning of the 20th century that consists in studying and comparing lakes. In addition to this thematic link, this tribute is also geographical, as François-Alphonse Forel was originally from French-speaking Switzerland and lived in Morges (Vaud). Various exchanges of letters with F.-A. Forel's descendants have confirmed not only their agreement, but also their interest in this emblematic project.



*François-Alphonse Forel's portrait
Chastellain & Gross (1895 - 1898)
Geneva Library.*

3. Administrative status of the boat

In parallel, several administrative issues had to be clarified concerning the boat's status:

- **Regularization** of the vessel's temporary status under the British flag, with a tonnage certificate required for final registration. This was carried out in **February 2023** with the support of Bureau Veritas;
- **Classification** : after several enquiries and analyses by classification societies and other bodies, it became clear that a “post-construction classification” was not possible, given the boat's age. In order to avoid time-consuming and costly conversion work, steps were taken with the OSNM - Office Suisse de la Navigation Maritime - to classify FOREL as a pleasure craft;
- **Ownership of the boat** : acquired by the SPF - Swiss Polar Foundation in **September 2022**, ownership of FOREL was contractually transferred to the Forel Heritage Association on **April 15, 2024**;
- **Flag** : Given the project's Swiss roots, the desire to register the boat under the Swiss flag was asserted very early on in the project. However, to achieve this, it was necessary to consider the fact that the Swiss legal framework does not allow the registration of a boat in the name of a foundation. For this reason, the Forel Heritage Association was created on **January 29, 2024** (see **PART 2**). The Swiss flag was finally obtained on **April 19, 2024**;
- **Tax status** of the vessel in France: given the forthcoming conversion work, the “perfectionnement actif” status was obtained from French customs, allowing exemption from French VAT for the duration of the work;
- **VAT** : a general analysis of Swiss and European VAT issues was carried out. This led to the Association's registration in the Swiss VAT Register. Analysis of the VAT situation in France is still in progress. The first stage has validated the framework and constraints associated with European VAT.



PART II

Creation of the Forel Heritage Association

As Swiss maritime law does not allow the boat to be registered under the Swiss flag as the property of a foundation, it was decided to create an association. The **Forel Heritage Association** was formally created at the Constitutive General Assembly held on **January 29, 2024**.

The Association's head office is in Ecublens (Vaud).

According to its bylaw, the Association's aim is to carry out various research projects in collaboration with the Swiss and international scientific community, including educational projects, i.e. to promote the development of education, science, research, understanding, and knowledge of extreme environments such as those located in the polar and sub-polar regions, as well as other regions of great scientific interest.

In particular, the Association manages, administers, charters, and operates a scientific sailing vessel. It also manages the acquisition and maintenance of scientific instruments aboard the sailing vessel.

The Association does not pursue any profit-making or economic goals. It does not carry out any commercial activities.

The Association's governing bodies are the General Assembly and the Committee.

The Association was duly registered with the Registre du Commerce du Canton de Vaud on **May 2, 2024**.



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PART III
Conversion
of FOREL



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Registered under the British flag (pleasure yacht category), FOREL docked in Brest on **January 3, 2023**, following its delivery from Brazil. Brest was initially considered as the boat's home port, given its proximity to IPEV - Institut Paul-Emile Victor, IFREMER - Institut Français de Recherche pour l'Exploitation de la Mer, the French Oceanographic Fleet (FOF) and Océanopolis.

To make FOREL fully operational and suitable for polar scientific missions, a detailed analysis of all the vessel's components was carried out during the **first half of 2023**. The main headings of this analysis were as follows:

- **Replacement of the propulsion system**, in particular, to obtain the EIAPP certificate required for registration under the Swiss flag. This involved changing both propulsion engines and their exhaust systems, with the introduction of an SCR system including urea injection (AdBlue);
- **Complete overhaul of the on-board power supply and energy storage system** in line with the energy demands of future on-board scientific equipment: replacement of generators, upgrading of the battery bank and complete overhaul of the on-board electrical network (400 / 230 / 24 and 12 V);
- **Fitting out of laboratory areas** by partitioning off the large aft hold, creating several areas dedicated to research work: a wet laboratory, a dry laboratory, a clean laboratory, a workshop, and a technical room, as well as a work/storage area;

- **Installation of a winch** and launching system for scientific equipment;
- **Reorganization of the living and sleeping areas** to accommodate 12 people on board by adding a table in the saloon, partitioning a berth to create a cabin, and creating new berths in the sleeping area;
- **Overhaul of rigging and deck fittings;**
- **Update of safety equipment;**
- **Miscellaneous overhaul, maintenance and improvement work**, such as hydraulics and electronics.

In **March 2023**, the crew began removing the fittings, panels, and insulation from the aft hold, as well as various items of equipment that were not to be reused. The acquisition of two 20-foot containers made it possible to create a nearby storage space during this period of technical work.

As the vessel was due to undergo major modifications and equipment additions, stability tests were carried out in Brest during the **2nd quarter of 2023**. This information was used by an independent marine surveyor to carry out stability studies.

Given the difficulties in moving this project forward effectively in Brest, contact was initiated with other shipyards in the region. After a call for tenders, the AML - Ateliers Mécaniques Lorientais yard was finally selected at the end of **June 2023** to carry out the conversion work. Among the decisive factors in this choice, beyond price-related criteria, were the shipyard's excellent responsiveness and the experience acquired through the re-motoring of PANGEA, FOREL's sistership, built in the same shipyard in Brazil. It should also be noted that Lorient boasts a range of infrastructure adapted to the size of the boat (travel lift, careening area), as well as a wide range of businesses capable of carrying out the specialized work required.



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The main calendar milestones were as follows :

- June 20** : arrival of FOREL in Lorient;
- June 23** : launch at Keroman careening area;
- June 24** : careening of the vessel;
- July 12** : dismasting;
- July 13** : FOREL enters the AML Hangar.

The work was shared between the AML shipyard, the FOREL crew, and various specialized companies. The [appendix A.1](#) gives a detailed and chronological overview of the work carried out on the boat.

An aerial photograph of a dramatic coastal landscape. In the foreground, a dark, rocky sea stack rises from the water. To its right, a small white sailboat with two masts is visible on the dark blue sea. The middle ground is dominated by a thick layer of white mist or low clouds that fills the valleys between the mountains. In the background, a massive, rugged mountain range with steep, dark rock faces and patches of snow stretches across the horizon under a clear blue sky.

PART IV

Expeditions 2024

1. Objectives

The year 2024 was to be considered a test year for FOREL, with the main objective being to confirm the vessel's potential for scientific research missions in polar and sub-polar environments. For the crew, this test year was intended to provide a better understanding of the ship's behavior at sea and in ice conditions. At the end of these first navigations and expeditions, the aim was also to be able to define the points to be improved in order to have a reliable and optimal vessel for future expeditions.

Finally, 2024 was also intended to raise the profile of the vessel and demonstrate its potential, particularly to the Swiss and international scientific community.

Two research programs were carried out in southwest Greenland aboard FOREL during the summer of 2024. In early July, the yacht served as a research platform for the Swiss "GreenFjord" program (<https://greenfjord-project.ch>). The ship was then used by students from Professor Philippe Archambault's laboratory at Laval University (Quebec, Canada) as part of the Benthos project.



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2. Convoying and navigation

The campaign took place during the summer of 2024. It was divided into four stages :

- **Stage 1**, Lorient (France) to Narsaq (Greenland);
- **Stage 2**, Nordre Sermilik Fjord (Narsaq region), “GreenFjord” campaign;
- **Stage 3**, round trip from Narsaq to Bear Sound Fjord (south of Qeqertarsuatsiaat) and back to Narsaq, “Benthos” project;
- **Stage 4**, Qaqortoq (Greenland) to Lorient.

Despite a few repairs during navigation, no major technical problems were encountered during the convoys.

During the outbound voyage (**June**), as the boat approached the southwestern coast of Greenland, it encountered a large multi-year-old ice formation blocking the entrance to the fjords of southern Greenland. This unusual situation is probably linked to climate change and excessively high temperatures at the North Pole. As a result, the ice pack broke up more than usual and descended south of Greenland, following the transpolar current off Greenland's east coast. As a result, FOREL had to take refuge further north and docked at the village of Paamiut (Greenland) on **June 21**. While waiting for the ice to clear the passage, the crew took the opportunity to continue a series of tests, notably on the winch. After several attempts, it was not until **July 1st** that FOREL was finally able to find a passage through the ice and reach Narsaq on the morning of **July 2nd**.



3. GreenFjord Program



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The vision of the “GreenFjord” research program supported by the Swiss Polar Institute (SPI) is to create a process for understanding how climate change affects fjord ecosystems and how this impacts biodiversity and livelihoods. The program consists of 6 research groups studying the ocean, glaciers, atmosphere, land, biodiversity, and the perception and effects of climate change on local communities in a South Greenland fjord ecosystem. The program runs from 2022-2026.

The main objective of the “GreenFjord” team aboard FOREL was to study ocean-ice-air interactions and biodiversity in Nordre Sermilik, north of Narsaq in southwest Greenland, at high spatial and temporal resolution. More specifically, the team studied background oceanographic variables (temperature, salinity), (micro)nutrients, chlorophyll, dissolved and particulate organic carbon/nitrogen, trace gases (CO_2 , CH_4 and N_2O), phytoplankton composition, as well as fish community structure based on in situ environmental DNA (eDNA) sampling, and atmospheric chemical composition (aerosols).

As mentioned above, the start of the GreenFjord mission had to be postponed to **July 2** due to exceptional ice conditions. Despite these constraints, the mission was carried out in the fjord as planned. This first campaign enabled the crew to validate the operation of the winch, launch system and other instruments, all of which worked well overall. Due to the schedule, the pace of the mission was sustained, with relatively long stations. The crew was rotated to limit the duration of the work periods.

4. Benthos Project

The research program led by Professor Philippe Archambault (Université Laval) aimed to carry out advanced studies on the biodiversity of benthic communities as a function of their physico-chemical environment, while also studying the response of the benthic community to glacial runoff. The Université Laval team wanted to complete the sampling that the sailing vessel ATKA was unable to carry out during its 2019 mission in the Nordre Sermilik and Igalikup Kangerlua fjords. The team had also planned to carry out additional sampling in two other fjords (Kuannersooq and Bear Sound), which had already been sampled in 2019.

Two types of fjords were studied: those influenced by marine-terminated glaciers (MT) and those influenced by land-terminated glaciers (LT). Marine-terminated glaciers are becoming increasingly rare with global warming. It is therefore important to acquire data to better understand and predict the effect of disappearing marine glaciers in the fjords of Greenland.

The Benthos project went well. As far as trawling was concerned, a “fuse” system was put in place to limit the risks inherent to this type of operation, especially for a first campaign. Finally, the system enabled the vessel to move forward at reduced speeds without jerking.

The installation of two depth sounders (deep and multibeam) enabled the scientists to investigate the depths and nature of the seabed before deploying the skips, which greatly facilitated the subsequent sampling.



5. Samples collection



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The two scientific programs carried out in 2024 focused on water and air sampling for chemical and biodiversity analysis (“GreenFjord” project), respectively on sediments and benthos organisms (“Benthos” project). Sampling took place in four fjords in southwest Greenland.

During this expedition, FOREL team deployed 8 rosettes and 11 Niskin bottles for water collection, 8 peristaltic pumps for in situ filtration, 9 Sub-Ocean for measuring oceanic greenhouse gases, 15 plankton nets for plankton collection, 55 sediment samplers for benthos and sediment collection, 9 Agassiz trawls for benthos collection, and 48 drop cams for collecting images of the ocean floor. 8 atmospheric stations were also set up. Throughout the installation of these stations, spot samples were collected. In addition to these punctual data points, continuous data were also collected. At each sampling site, a conductivity, temperature, and depth (CTD) probe was deployed. A total of 48 deployments were carried out. To complement the physico-chemical data collected with the CTD at all oceanographic stations, an onboard system (SubCtech) was used to determine the physico-chemistry of surface waters. The onboard system was mainly used in the fjords studied.

Mapping was carried out in the studied fjords using multibeam sonar. This mapping was used to position sediment collection stations, as well as trawl and drop cam deployments.

Samples were sent to various laboratories. The data and samples recovered by the "GreenFjord" team will be processed mainly in the following laboratories :

- Department of Environmental Systems Science, ETHZ;
- Extreme Environments Research Laboratory, EPFL;
- Smart Environmental Sensing in Extreme Environments, EPFL;
- Institute of Earth Sciences, University of Lausanne (Switzerland);
- Benthic samples and sediments will be processed in Professor Archambault's laboratory ("Laboratoire d'écologie benthique", Université Laval, Canada).

Scientists will share their data on open-access repositories. The results will ultimately be published in scientific journals to share the knowledge acquired.

As already mentioned, one of the main objectives of this first year of operation was to test FOREL's ability to carry out scientific missions in polar and sub-polar regions. With this in mind, comments and observations were made following the two campaigns carried out this summer. The feedback received from the scientific teams and oceanographic technicians who took part in the 2024 campaign is very positive. Suggestions for adaptation and improvement have been collected. These will be incorporated into the coming work that will be carried out during the first months of 2025.





PART VI

Communication & Outreach

1. Communication

Website

The Forel Heritage Association regularly publishes articles on its website (www.forel-heritage.org) to give exposure to its activities. These articles explain the Association's activities, share the stages of FOREL's shipyard operations, present the educational partnerships, explain the scientific missions carried out on board the FOREL, etc.

Some statistics :

- 30 articles were published in French and English (convoy, shipyard, educational visit, "Greenland 2024" expeditions, return to Lorient);
- Nearly 12,000 visits on the website from January to October 2024; peaks in June, July, and August (during the expeditions) with around 1,600 visits / month;
- Origin of website visitors (sorted by number of visits): France, Switzerland, Canada, Germany, Netherlands, Brazil;
- A quarter of visits are on the English version of the website.

Media coverage

- Instagram: account opened on October 25, 2023; 56 posts, 327 followers;
- X platform: 192 Following, 256 Followers, 49 posts;
- Photos: two professional mediemen came on board during the 2024 campaign and captured numerous photos to illustrate the expeditions. Their images were used on social media, the website, and in several documents (scientific and educational communication, reports, etc.);
- 4 videos were filmed during the first Greenland expedition. They were published on the director's Instagram account (Valentin Prout);
- Creation of a series of podcasts entitled "FOREL, FOREL, FOREL, je vous reçois 5/5" featuring interviews with FOREL crew members and scientists on board during the expedition. This corresponds to a total of 9 podcasts of 6 to 9 minutes each, for a total duration of approximately 1h15 of audio documentary.

Press

During 2024, FOREL was featured in 15 press publications :

- [Le Télégramme](#), 13 April 2024 : Forel, un nouveau navire scientifique basé à Lorient
- [Ouest France](#), 14 April 2024 : Une nouvelle goélette d'exploration basée à Lorient
- [Le marin](#), 16 April 2024 : La goélette scientifique « Forel » mise à l'eau à Lorient
- [Mer et Marine](#), 5 June 2024 : Expédition polaire : le voilier suisse Forel paré au départ
- [Heidi News](#), 6 June 2024 : La Suisse a désormais son navire polaire : le Forel
- [RTS, AUDIO & PODCAST](#), 18 June 2024 : Mission Greenfjord : le voilier suisse "Forel" à la conquête du Groenland
- [Avis d'experts](#), 18 June 2024 : Mission Greenfjord : le voilier suisse « Forel » à la conquête du Groenland
- [My Science](#), 4 July 2024 : Expédition au Groenland, à bord d'un voilier transformé en plateforme scientifique
- [Voiles et Voiliers](#), 24 August 2024 : La suisse a son voilier d'exploration polaire
- [Ouest -France](#), 24 September 2024 : La goélette Forel amarrée au ponton du Péristyle
- [Le Télégramme](#), 25 September 2024 : Grâce au voilier Forel, on scrute la fonte des glaces
- [Mer et Marine](#), 2 October 2024, Forel : un premier bilan positif pour la première expédition du voilier polaire suisse
- [Ports pays de Lorient](#), 25 October 2024, inauguration du ponton la découverte
- [Le Télégramme](#), 25 October 2024, Le ponton de La Découverte, le septième port de Lorient
- [Ouest-France](#), 25 October 2024, Lorient va accueillir les bateaux d'hier, d'aujourd'hui et de demain

ACTUALITÉ

Forel : un premier bilan positif pour la première expédition du voilier polaire suisse

Par Charlotte David - 02/10/2024

f X in





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Public visibility in Lorient

The partnership with the **Cité de la Voile Éric Tabarly** in Lorient offers great visibility. Visitors to the Cité de la Voile have access to the pontoon where FOREL has its official berth. Three educational panels have also been installed to the pontoon.

Visits to the Cité de la Voile Éric Tabarly pontoon (January to October 2024):
110,000 visitors, over 10,000 school children.



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Visibility in Greenland

Through its educational vocation, the Association aims to create links between scientists and the general public, as well as with local communities. With this in mind, Greenlandic language content has been produced for the first expedition campaign in 2024. This content has been validated by Greenlandic contacts in Ilulissat (Disko Bay).

- Poster presenting FOREL ship's program in the fjords of Greenland (presentation of the ship, scientific missions, stopovers, etc.);
- Thanks to the Greenlandic people for allowing FOREL and its crew to visit their territory;
- Invitation to come aboard FOREL when docked in a Greenlandic port (Paamiut, Qaqortoq, Narsaq, Narsasuaq);
- Poster on board, printed and displayed in the village;
- Poster shared on Greenlandic social networks (Facebook of municipalities and communities of municipalities).

Scientific communication

FOREL has been (or will be) presented at the following events :

- [Institut Nordique du Québec](#), 18 janvier 2024, Forel, Séance d'information (Canada);
- [Swiss Polar Day 2024](#), 12 septembre 2024 (Suisse);
- [Arctic Circle Assembly](#), 17-19 octobre, Reykjavik (Islande);
- [Arctic Change](#), 8-12 décembre, Ottawa (Canada);



2. Outreach

Educational partnership with the Cité de la Voile Éric Tabarly (Lorient)

A partnership agreement has been signed between the Forel Heritage Association and the Cité de la Voile Éric Tabarly (CDLV) in Lorient. The latter will guarantee a berth on its visitor pontoon when FOREL is in Lorient (except when TARA is present at the same time).

In exchange, the Forel Heritage Association:

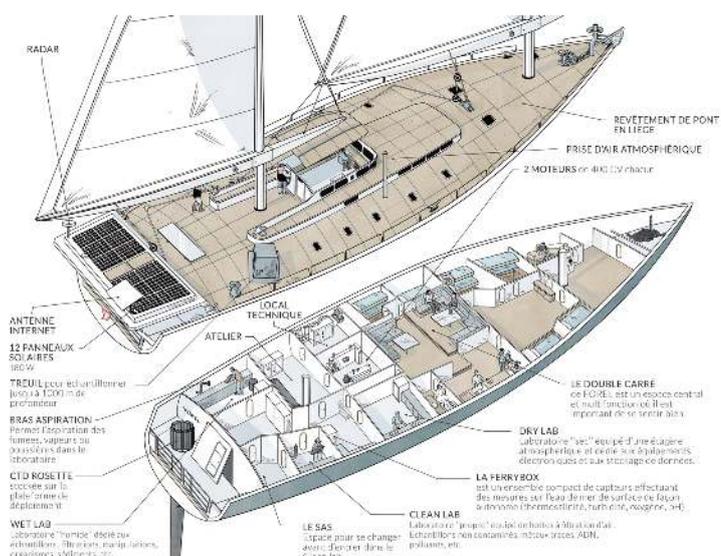
- makes FOREL available for educational visits by CDLV educational guides;
 - Makes 2 slots available every Friday afternoon in May for visits;
 - Makes slots available 3 days a week in November and December 2024 for school visits;
- trains CDLV educational guides to make them self-sufficient;
- creates educational content for the general public;
- collaborates on communication via CDLV networks.

This first year of the partnership was a success. The CDLV guides have been in contact with the FOREL team on several occasions. The on-board visits with the children are going very well. Following these visits, the CDLV has also received excellent feedback from teachers. Last but not least, the CDLV guides have shown themselves to be flexible and able to adapt to the conditions imposed by the Association.



Examples of outreach tools and key figures

- **Educational visits** aboard the FOREL in Lorient (duration: approx. 1 hour);
- 180 pupils aged 6 to 9 visited the FOREL in May 2024;
- 800 pupils are expected for November and December 2024;
- 7 guides from the Cité de la Voile Éric Tabarly were trained by the Association;
- **3 educational displays** were created and installed on the CDLV pontoon;
- Creation of a **Greenlandic language poster** describing and informing about the project to share on Greenlandic social networks and communicate with Greenlanders during stopovers;
- **Educational mini-comics** “Les carnets de FOREL”, which takes the listener on board the vessel on a mission to Greenland. The main aim is to make polar science understandable and accessible as part of the drive to raise awareness of global warming;
- **Artist in residence:** illustrator Lauriane Miara boarded FOREL during the Canadian scientific mission and for the transatlantic return to Lorient. She had three objectives: (1) to produce educational illustrations to popularize the science carried out on board FOREL; (2) to create a wildlife book on the seabirds of southern Greenland; (3) to produce sound work illustrated with iceberg drawings. The Greenland drawings were exhibited at the Salamandre Festival from October 25 to 27, 2024 in Morges (Switzerland).



PARTI VI

Conclusion



Conclusion

The journey from the purchase of the Paratii-2 boat by the Swiss Polar Foundation in October 2022 to the departure of FOREL from Lorient for Greenland under the Swiss flag in June 2024 has been a lengthy process. It began with bringing the boat from Brazil to France. Then, planning and carrying out a major conversion of the boat, involving the crew as well as numerous local and international service providers.

Meanwhile, the Forel Heritage Association was created in January 2024 to provide a framework for the development of the FOREL program. It was in this context that the Swiss Polar Foundation donated the boat to the Association in April 2024. After numerous administrative formalities, the FOREL was finally registered under the Swiss flag in April 2024, underlining the Forel project's strong link with Switzerland.

Leaving the port of Lorient on June 7, the FOREL team successfully completed an international multidisciplinary research program during a 70-day expedition in the coastal waters of Greenland. The expedition demonstrated the scientific capability of the FOREL research platform in cold coastal regions. The team also demonstrated its expertise and ability to navigate in difficult and unexplored coastal waters, which not only enabled the collection of valuable scientific data, but also the training of young sailors.

This polar expedition also enabled students (EPFL and ETHZ, Switzerland, and Université Laval, Canada) to take part in a real oceanographic expedition, helping them to acquire valuable research skills. It also created or strengthened links with collaborators from a number of institutions, whether in Switzerland (EPFL, ETHZ, Université de Lausanne), Greenland (Greenland Institute of Natural Resources) or Canada (Université Laval, Québec). Not to mention the fruitful interactions with local communities.

This collaboration has brought together the best academic expertise to study benthos, plankton, biodiversity communities, greenhouse gases, atmospheric composition, ocean biogeochemical cycling, and environmental conditions. This unique project will help improve our understanding of Arctic coastal regions in the context of climate change.

In conclusion, 2024 can be considered a successful test year for the operational launch of FOREL.

PART VII

Acknowledgements



Acknowledgements

FOREL (ex PARATII-2) was acquired by the Swiss Polar Foundation (SPF). Ownership of the vessel was then transferred to the Forel Heritage Association (AFH). This acquisition was made possible thanks to the generous support of Mercuria Energy Group and the Villars Institute Foundation. We also would like to thank Ferring Pharmaceuticals, the Fondation du Domaine de Villette, SICPA, Frederik Paulsen, Nicole and Patrick Aebischer, Daniel Borel, and Barry Wilson for their financial support in refitting the vessel as a research platform and carrying out its first scientific campaign. We are very grateful to these sponsors for their financial support for the Forel project, which would not have been possible without their help.

The Association also wishes to thank the Danish Ministry of Foreign Affairs for granting the permission to navigate and conduct research in Greenlandic waters (JTHAV file no. 24/17106). We also thank the Swiss Embassy in Denmark, which supported our application, and to the Greenland Government and its Ministry of Industry and Energy for allowing scientific research to be carried out along the coastal zone of southwest Greenland and for granting non-exclusive licenses for the use of Greenland's genetic resources (No. G24-047; G24-113). This gratitude also goes to the Ministry of Agriculture, Self-Sufficiency, Energy and Environment (Expedition Office) of the Government of Greenland for authorizing this expedition (No. C-24-1403).

The Association warmly thanks all the professional sailors, researchers, and principal investigators for their involvement and contribution to this project, as well as the partners for their assistance in this project. This gratitude also extends to all staff, friends, family, and volunteers for their help with logistics, equipment, and document review.

Finally, the Association would like to thank Greenland and its people for their warm welcome and for providing access to their territory.

Major partners and sponsors



FONDATION DU DOMAINE
DE VILLETTE

PAULSEN Frederik

BOREL Daniel

WILSON Barry

AEBISCHER Nicole & Patrick

Institutional and scientific partners



SWISS POLAR
INSTITUTE



Partners communication & outreach



Technical partners

Mécatlantic



SOLBIAN



Seacork

SEA.AI

Team 2023-2024

**Boat conversion
& sailor embarkation**
(alphabetical order)

AEBISCHER Stéphane, BERNARD Baptiste, CARDIS Bertrand, CHAVERIAL Gauthier, DEMANGEAT Arthur, DELBOT Brieuc, DEVOUGE Nathalie, FAGGIANNELLI Claire, FAGGIANNELLI Marie, GIRARDOT Julien, GUARIN Virginie, HERTAUX Martin, LE GARS Erwan, LENEUN Chloe, LOISELET Mathieu, LOOTEN Nicolas, LUBRANO LAVADERA Julien, MELSEN Matthijs, MIARA Lauriane, MUCHERIE Johann, PROULT Valentin, REAUD Yvan, REGNIER Baptiste, TISNE Lou, WILLMOTTE Louis, ZYSSET Nitya.

Appendix

A1. Boat conversion stages

June 2023

- Photogrammetry of the vessel to create a computerized hull plan.
- Emptying of the vessel, take off isolation of the aft hold.

July 2023

- Removal of propeller and propeller shaft.
- Dismantling and installation of the masts on the platform.
- Removal of the exhaust lines and the small 8KW generator.
- Subctech visit to study the ferry box.
- Thalos visit to study onboard communications systems (Iridium / Starlink).
- Aft rudder removed for bearing overhaul.

August 2023

- Removal of marine bearing of propeller shaft. Replacement required. New 80 mm diameter propeller shaft- After discussion, AML agreed to supply a new 80 mm diameter shaft line.
- Starboard aft marine bearing. Reaming required.
- Propellers sent to Maucour for pitch modification.
- Aft rudder shoe removed to overhaul of the lifting system.
- Visit to Olivier Petit to study the re-installation of the daggerboard system.
- Visit to Sailwood to study quotations for all joinery/insulation work.
- Mecatlantic visit - beginning of discussions on the installation of SCR exhausts.
- Preparation of engine mountings.
- Reception of Twin Disk.
- Removal of peripheral engine and engine room insulation.
- Removal of engine room bulkhead cladding.
- Installation of fireproof insulation

September 2023

- Removal of deck covering.
- Study of various water circuits (fresh water, sea water, domestic hot water).
- Removal of bridge paneling and search for leaks.
- Glycol draining of the 2 keels.
- Validation of future arrangement drawing
- Bore of starboard sternpost.
- Batteries checked out-of- use / disconnected and landed.
- Removal of air vent grille of the engine room.
- Manufacture of battery banks in CP - Epoxy.

October 2023

- Reception of the Cummins QSM11 propulsion engines.
- Cleaning of neoprene glue on deck.
- Reception of the machine fan.
- Manufacture of new machine ventilation ducts.
- Visual check of the diesel tanks.
- Overhaul of masts and rigging.
- Cleaning of the diesel tanks.
- Welding on the cankers in diesel tanks.
- Arrangement of news front berth.
- Cleaning of the black water tank.
- Replacement of the large rudder bearings.
- Arrangement of the saloon and berth.
- Installation of news propulsion engines on their mounts supports.

November 2023

- Modification of the exhaust systems to accommodate the new GE exhausts.
- Creation of new diesel tank inspection hatches.
- Overhaul and cleaning of existing diesel tank inspection hatches.
- Engine lineage.
- Revision of daggerboard – Welding on the cankers.
- Installation of the new propeller shaft.
- Installation of propellers with modified pitch.
- Arrangement of saloon and berth.
- Manufacturing of an aft gantry antenna support.
- SCR exhaust reception.
- Hull painting (antifouling) daggerboard well and large rudder.
- Installation of an aft rudder.
- Removal of bridge portholes.
- Installation of engine fans.
- Overhaul of the windlass.
- Tracing of laboratory bulkheads.
- Installation of diesel inspection hatches.
- Installation of cork deck covering.
- Creation of a head daggerboard template.

December 2023

- Fabrication of a GE frame.
- Installation of new engine coolant.
- Creation of SCR supports.
- Spaying of cork in the aft hold.
- Installation of cork deck covering.
- Installation of gaskets for the bridges portholes.
- Welding of exhaust bridle.

January 2024

- Manufacture of new glycol expansion tank.
- Installation of the GEs in the workshop and technical room.
- Testing and validation of the diesel tanks, including tightness.
- Arrangement Saloon.
- Installation of the battery banks.
- Manufacture of exhaust lines.
- Reinforcement of deck beam under the winch support.
- Winch Support fabricated and installed on deck.
- Testing of the water tanks.
- Installation of antennas on the aft support.
- Installation of cork deck covering.
- Installation of bridge portholes.
- Creation of atmospheric air intake bridle.
- Installation of a 24V electrical cabinet.
- Wiring of the battery park circuit.

February 2024

- Installation of new batteries.
- Installation of new glycol expansion tank.
- Spraying of cork in the bridge.
- Installation of laboratory / Workshop bulkhead support.
- Installation of exhaust lines.
- Installation of the main urea tank.
- Manufacturing of aft rudder top floor.
- Installation of aft hold Insulation.
- Installation of machine peripherals.
- Installation of solar panels on the aft gantry.
- Installation of bulkhead of laboratory.
- Installation of bridge portholes.
- Installation of a 400/230 V cabinet.

March 2024

- Modification of the aft deck railing.
- Forel outing of the AML building.
- March 26: Masting.
- Installation of the oceanographic winch.
- Arrangement of the kitchen – Corner fridge.
- Installation of the freshwater and seawater circuits.
- Installation of the laboratory worktops.
- Arrangement of the bridge.
- Installation of the sounder housing.
- General vessel wiring.
- Installation of the wastewater treatment system.

April 2024

- Weather station installed.
- April 15: Launch of FOREL.
- Engine tests and adjustments.
- Reception of the tender.
- Creation and installation of an equipment launch rail.
- Hull painting (antifouling).
- Wiring of the electrical network in the aft hold.
- Diesel bunkering.
- Installation of the miliQ system.
- April 29: arrival at the Cité de la voile.
- Installation of bridge electronics.
- Installation of the Swiss flag!

May 2024

- Winch test - Mac Cartney visit.
- Installation of the sails.
- Installation of the frame berth in the cabine captain.
- Machine sea trials and adjustments.
- Scan Mar reception and fitting.
- Science test.
- Radiator and heating system installation.
- Installation of water heaters.
- Installation of the ferry box.
- Installation of electrical appliances: Fridge and freezer food and science.
- Kitchen finishing.
- Cabinet installation.
- Sea trial ferry box.
- Completion of the appliance launch rail.
- Installation of cork deck covering on the aft deck.
- Installation of an Oscar masthead video system.

June 2024

- Provisioning.
- Finalization.
- June 7: FOREL sets sail for Greenland.

Contact

contact@forel-heritage.org

Website Forel Heritage Association

www.forel-heritage.org



Writing

Stephane Aebischer, Jean-François Ricci,
Baptiste Régnier, Anne-Claire Bihan-Poudec

Design

Anne-Claire Bihan-Poudec

Realization

November 2024



@Julien Girardot



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FOREL

RESEARCH PLATFORM