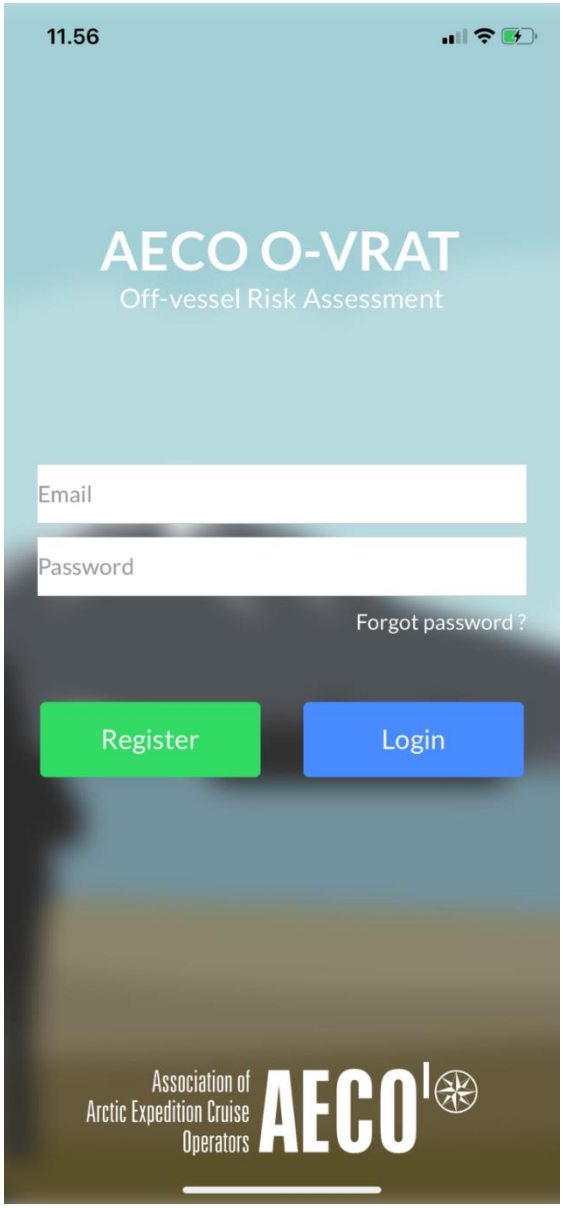
AECO Off Vessel Risk Assessment Tool (O-VRAT)

Project report

September 2020



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Funded by the Svalbard Environmental Protection Fund

SVALBARD ENVIRONMENTAL
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Background

AECO has cooperated with The Norwegian Institute for Nature Research (NINA) on developing site-specific guidelines for Svalbard based on site vulnerability analysis. In practical terms, one uses a risk assessment approach in respect to the natural environment and cultural remains. The vulnerability gives a numerical grade which is then translated into green, orange, and red zones used to determine risks and level of vulnerabilities on a site. This approach is static in nature.

The method is similar to what mariners do during vessels operations although their approach is more dynamic as conditions at sea can change rapidly. AECO got the idea to develop a dynamic tool for risk assessments during landing operations based on these principles. Every Expedition Leader responsible for operations will make a risk assessment prior to a landing but it may not be very structured and crucially, it will not be filed for documentation and accessible in case of an emergency happening.

In this project, by combining vulnerability assessments with risks and adding the human element, AECO was aiming to develop an easily applicable, tool to perform and document risk assessments related to "off vessel activities in cruise operations, starting with safety and sensitive environmental features on any given site when landing guests from ships. The tool needed to be comprehensive in scope, portable, and functional in an offline condition.

Phase 1 (2017-18):

The first phase of the project was spearheaded by a debate at the AECO Polar Field Staff Conference in 2017 with participation of approximately 80 field staff from a variety of different operators. The discussions led to a dedicated project workshop in the fall 2017 where a select group of experts and industry representatives developed the methodology that eventually would lead to the final application. The workshop had participation from field operations specialists and included Captain Leif Skog, Lindblad/National Geographic and Dagmar Hagen, representing NINA to define the safety, environmental, and human aspects that need to be taken into consideration when completing a comprehensive risk assessment for landing operations. This included the definitions of mitigation measures for each point identified. Based on the original NINA approach questions were designed which, depending on the answer of the user to each individual question, leads to mitigation methods being suggested by the application. The user can then tick off the mitigation methods used to counter the challenge identified. The process is intended to ensure the best possible preparation for any landing operations for all staff involved as well as a retrievable record of risk assessments in case the need arises. This work was partly funded by The Svalbard Environmental Protection Fund.

Phase 2 (2019-2020)

Additional funding from the Svalbard Environmental Protection Fund led to the design, development, and launch of an application (App) for portable devices. The development of the application was managed by Captain Henrik Ramm-Schmidt, Ramm-Schmidt Consulting Ltd., Finland. Captain Ramm-Schmidt was responsible for the technical development and cooperated with the AECO secretariat, and industry representatives on the content of the application.

Results

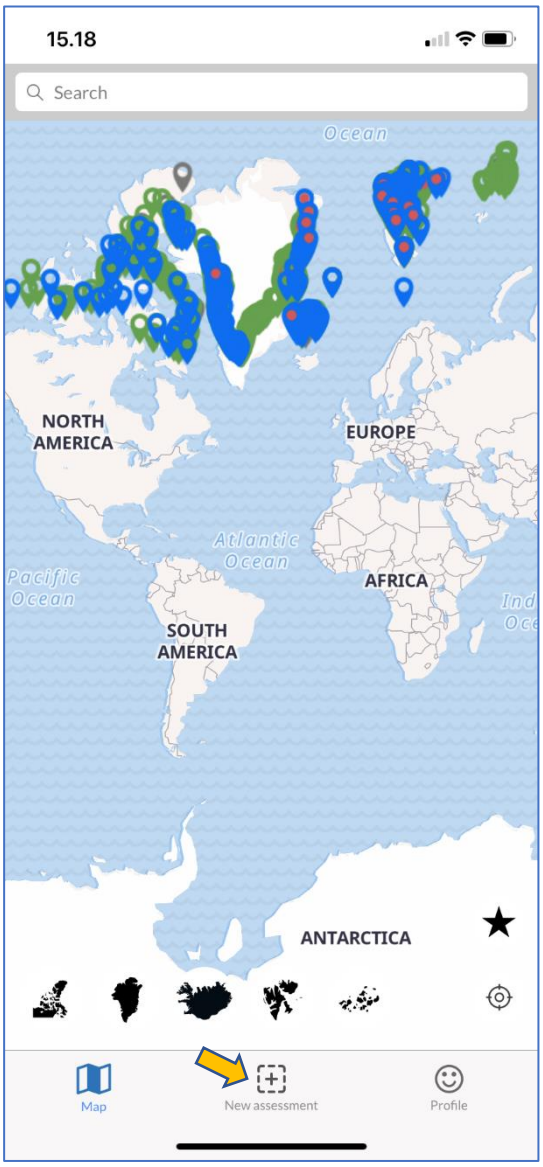
AECO has now completed and launched a mobile risk assessment application which includes mitigation methods within the risk elements that the Arctic environment can pertain but also encompass elements of site vulnerability regarding flora, fauna, erosion risk, cultural remains, etc. Additionally, the application features easy access to AECO's various guidelines and any legal (or other) restrictions that a site may be subject to. The work started in 2017 and the launch of the operational application in the Apple App Store and in Google Play was completed in July 2020.

The risk assessment feature offers a company authorized user to complete and log a risk assessment for landing operations from a dedicated vessel.

Application functionality

Startup page when logged on:

- Map with all sites corresponding to the sites registered in the AECO cruise database.
    - Green markers: No specific guidelines attached, nor any restrictions listed
    - Blue markers: Sites with guidelines attached
    - Markers with red center: Sites with restrictions attached.
- Site search capability or zoom to point select site
    - Quick access to restrictions, AECO Guidelines, and Notes
- Short cut maps for quick access to AECO geographical areas
- Ability to start new risk assessment directly by site name search
- Profile access which includes server synchronization



Point select site (zoom in and click):

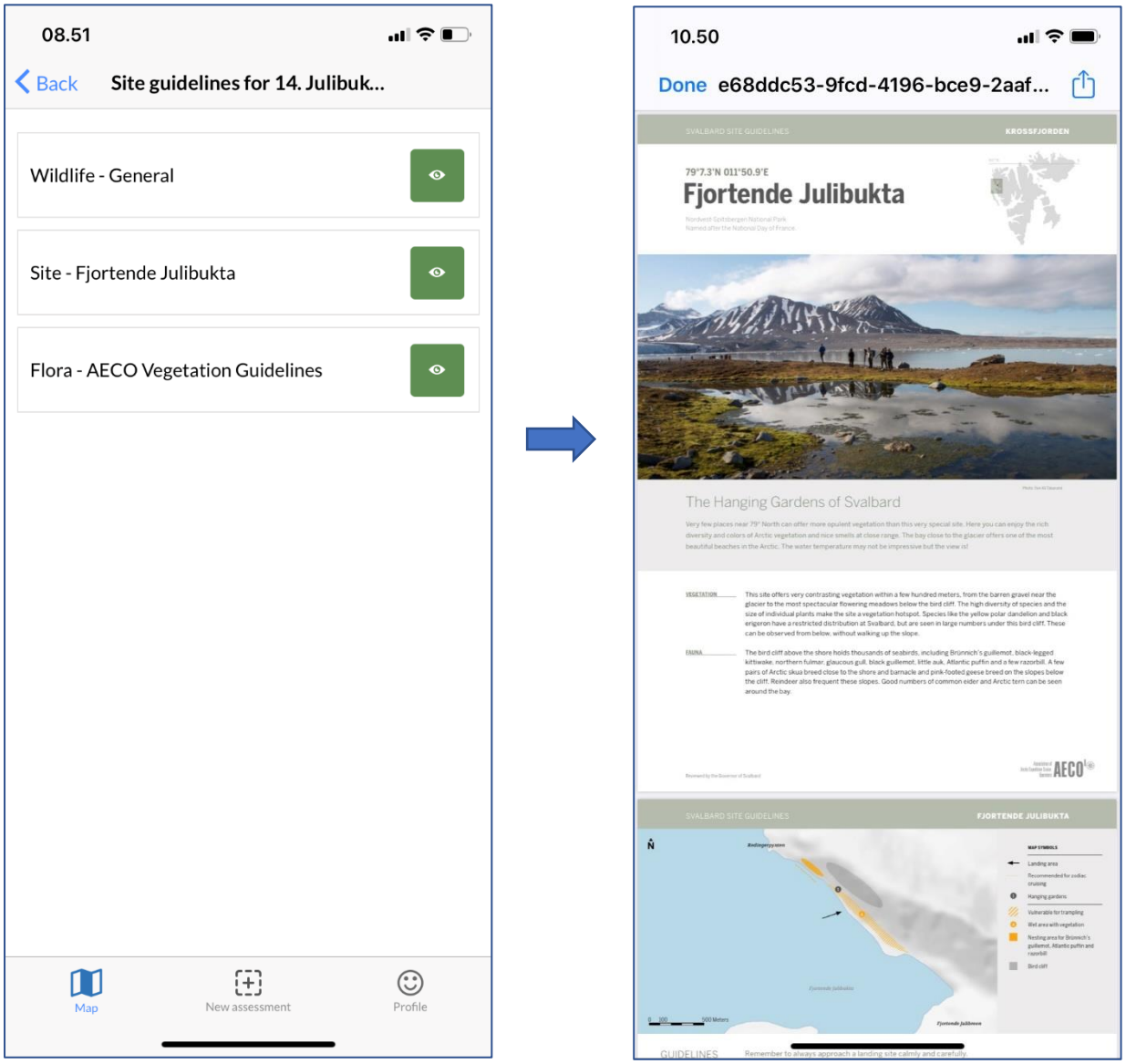
- Easy access to Restrictions (if any)
- Easy access to AECO Guidelines (if any)
- Easy access to Notes feature
    - Add new notes using
    - Review notes in tab
- Add sites to favorites with ★ or ☆
- Start new assessment directly for selected site
- Start new assessment by site name search

Restrictions tab

If access restrictions exist for a specific landing site or near to a registered landing site, the map marker has a red center and the restrictions tab is highlighted. Restrictions can be seasonal in nature or year around access prohibition. The ambition is to include official documentation for any restrictions such as maps, quotes from local legal framework, etc. for each site if applicable.

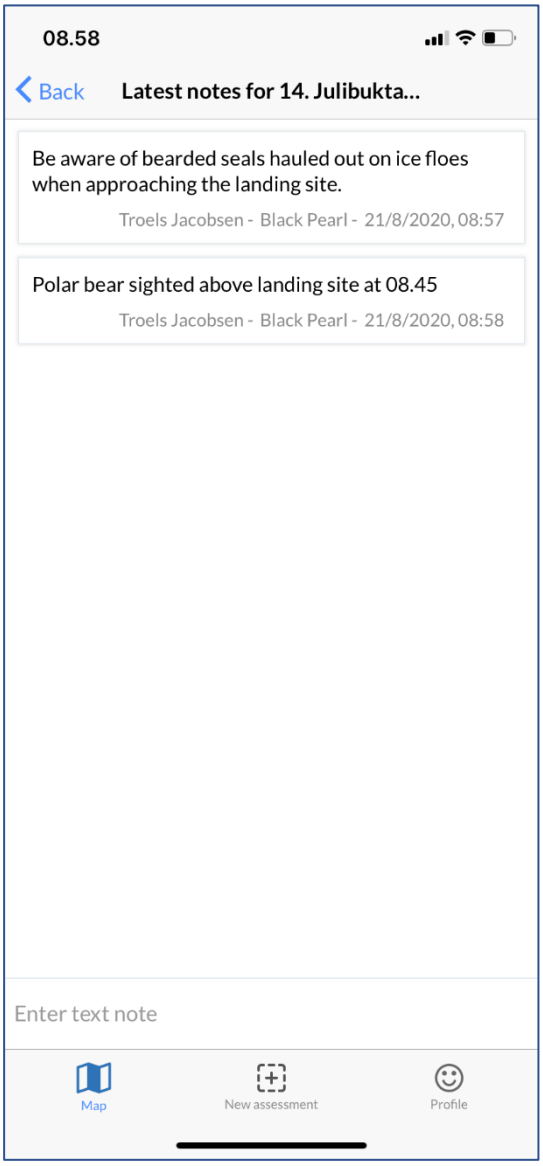
Guidelines:

Any of the comprehensive set of AECO Guidelines that is relevant to a site can be accessed directly in the application. A download in advance is required for offline view (see below for details).



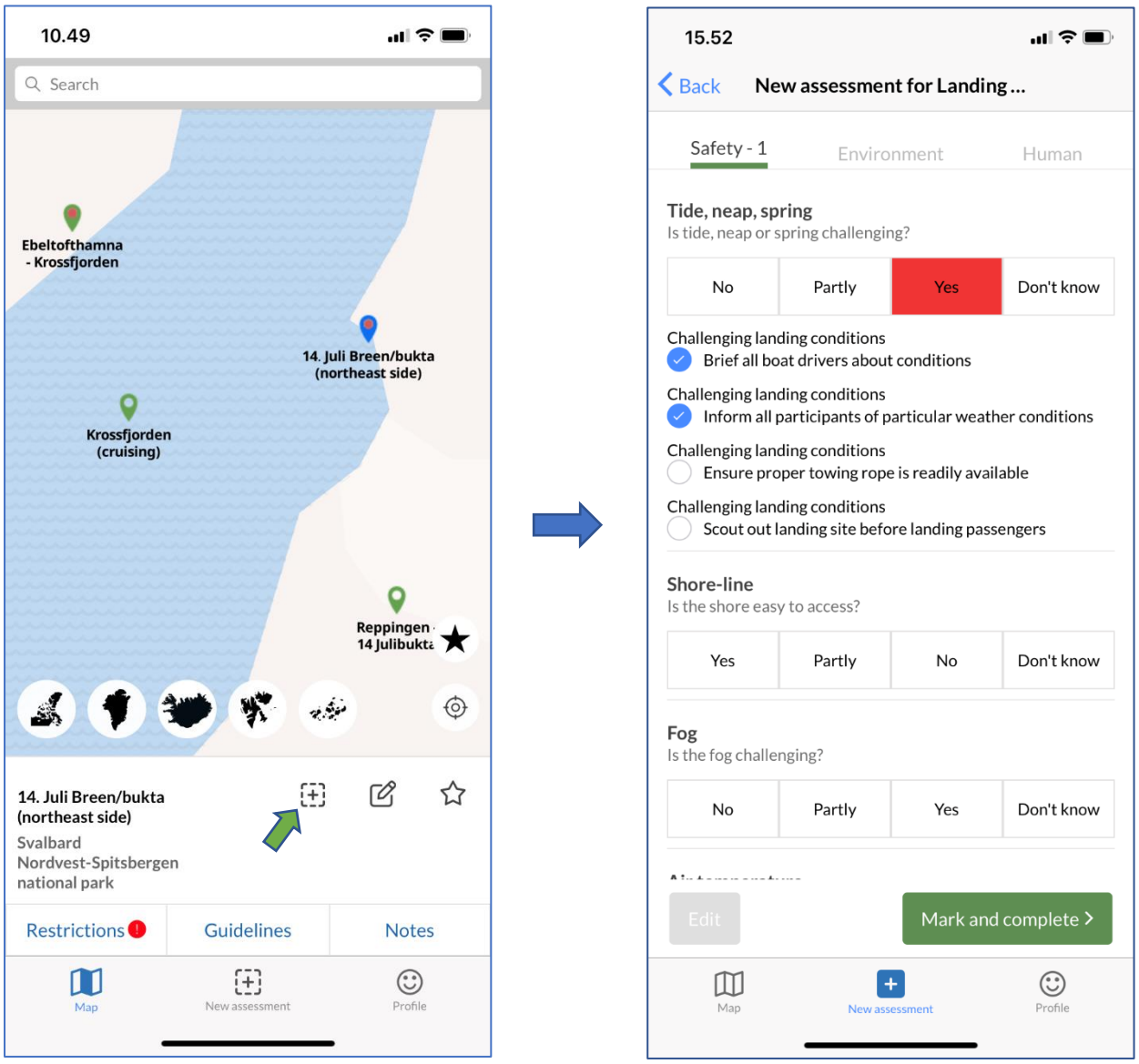
Notes:

The Notes feature will allow authorized users to add warnings and recommendations to future visitors. This could for example be if a polar bear has been spotted at a given date and time. It could also be environmental features that warrant extra caution or consideration if planning a visit. The notes are updated every time a server synchronization is completed. Hence it is not a “live” feature but as close to as current technology allows.

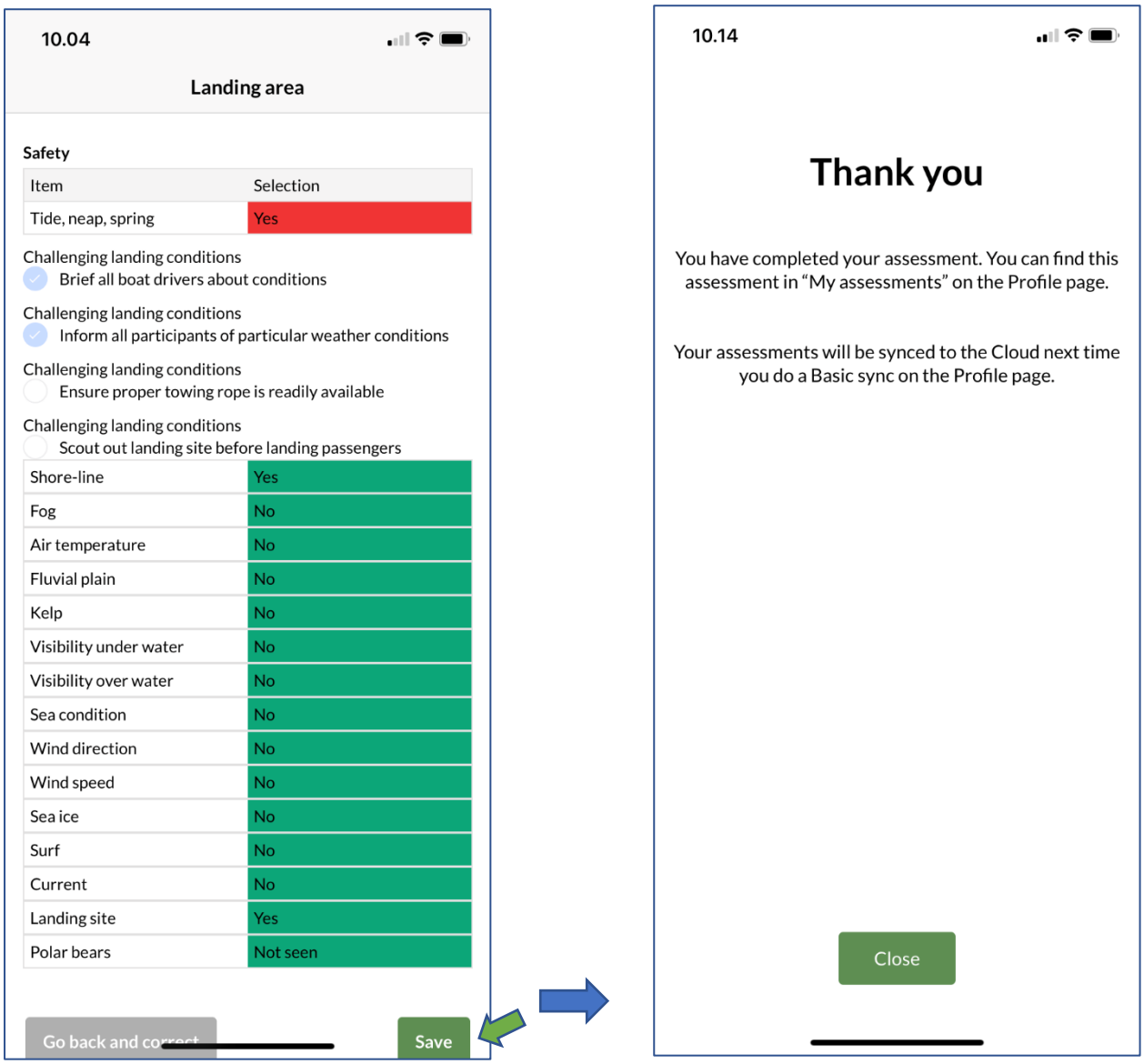


Risk Assessment

The risk assessment feature offers an authorized user to complete and log a risk assessment for landing operations. A dedicated workshop including AECO member specialists including Captain Leif Skog, Lindblad/National Geographic and Dagmar Hagen, representing NINA convened in Copenhagen in 2017 to define the safety, environmental, and human aspects that need to be taken into consideration when completing a comprehensive risk assessment for landing operations. This included the definitions of mitigation measures for each point identified. Based on the original NINA approach, questions were designed which, depending on the answer of the user, leads to mitigation methods being suggested by the application. The user can then tick off the mitigation methods used to counter the challenge identified. The process is intended to ensure the best possible preparation for any landing operations for all staff involved as well as a retrievable record of risk assessments in case the need arises.



Upon completing the assessment for Safety, Environment, and Human aspects, a save option appears. Initially this will save the assessment on the device. To complete and log the assessment onto the cloud server it is required to synchronize with the server when online.



The points of interest originally identified by the expert panel along with the mitigation methods attached are not mandatory requirements to complete an assessment. They can be skipped, and an assessment can still be filed to the cloud server. This is to enforce that the app is a tool to help expedition staff rather than dictate what is right or wrong. Conditions can be interpreted differently by different individuals depending on e.g. experience level, specific expertise, etc. The end responsibility and final say on any landing operation is firmly in the hand of the responsible persons on board. But if used as a tool the application can be helpful to make landing operations even safer in the future.

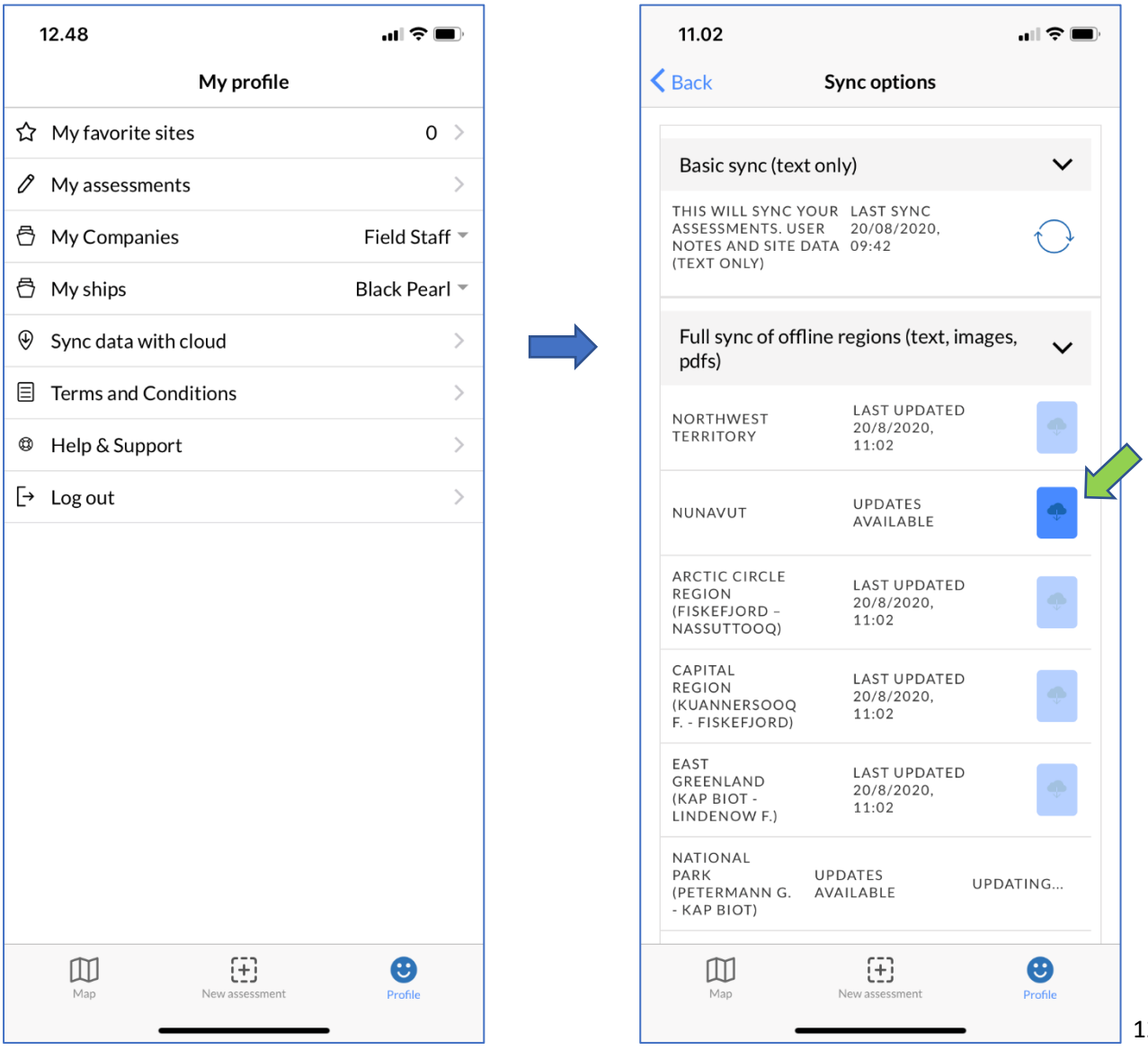
Offline functionality and server synchronization of the application

The profile tab includes a variety of information incl. the server synchronization option.

The application is an offline application. Internet connectivity in the Arctic is limited to what the expedition cruise vessel itself can supply outside of settlements. Often at a very high cost.

To make full use of the features in the application, but still enable minimum use of space on the device/bandwidth when synchronizing, it is possible to download data for select regions that is useful to the user. An example could be that Svalbard regions, incl. whatever guidelines/ restrictions linked to those regions, are not relevant if a person only works in Canada. Advance downloads of only Canadian regions will hence not give offline access to detailed information on Svalbard for example. Full access to all information is always available when the device is online.

Whenever connected to the internet a server synchronization should be made. This will upload any risk assessments that has been made and update notes (see below for details). Updates to any changes to sites that may have occurred (e.g. new sites added, new restrictions or AECO Guidelines added to the application) can be selected separately depending on bandwidth available. Regions with updates available are highlighted.

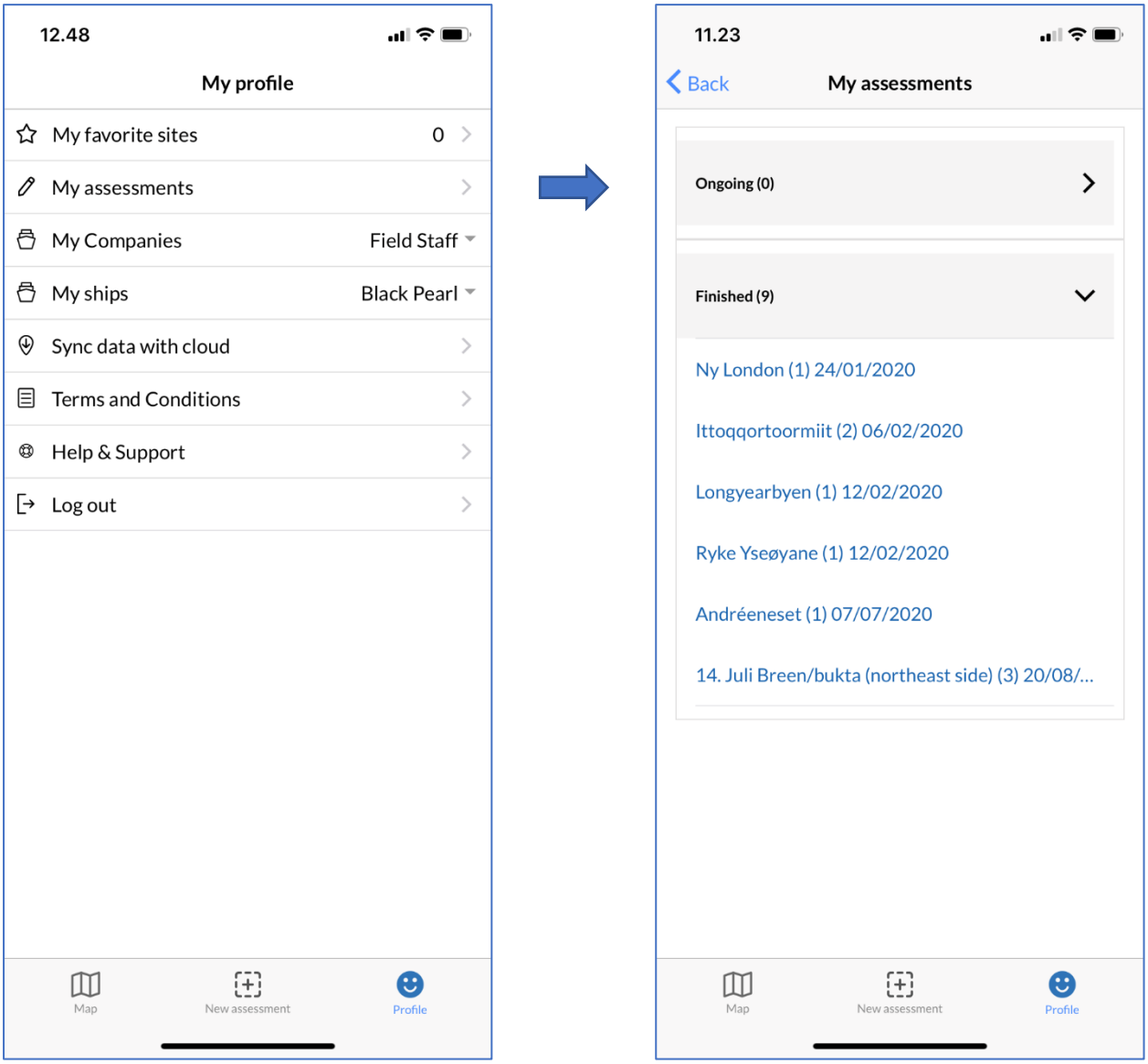


The application is for AECO members and their staff. Members will individually identify and authorize expedition leaders or others who can file a risk assessment. The list of authorized personnel will be forwarded to the AECO secretariat and registered in the O-VRAT admin site. Each individual will be registered with unique log on credentials and assigned to one or more authorizing companies (staff often works for more than one company). A dedicated company user must select company and ship for which any given risk assessment is made and filed.

The O-VRAT application also can be a useful tool for guides/others with no position in ships management and hence not authorized to file official risk assessments. These individuals will be registered collectively under the banner "Field Staff" which has only one ship assigned – *The Black Pearl.* In this way AECO has ensured that the possibility of conflicting risk assessments to any given landing on any given date and time is reduced considerably. A list of personnel without specific authorization will also be submitted to the AECO secretariat and registered accordingly.

Who has access to the logged risk assessments?

Currently only the user logging the risk assessment has direct access to their own assessments in



The AECO secretariat will also be able to extract assessments if required to do so. However, it is not in an easily available, export friendly format. Dedicated work and decoding will have to be undertaken to retain information in a readable format.

Budget and funding

The O-VRAT project was partly funded by Svalbard Environmental Protection Fund with two donations of NOK 270.000,- (phase 1 – pilot study and workshop) and NOK 460.000,- (phase 2 – development of mobile application). Secretariat working hours was funded by the AECO membership. The project was completed by September 2020, ahead of time, and on budget.

Future development

AECO has recognized the potential of the O-VRAT application and possibilities to expand the user interface with additional features. The available version of the app only features a risk assessment option for the activity "small boat landings". However, this is not the only activity that is conducted by expedition cruise vessels in the Arctic. Among others, "**small boat cruising**" with guests is often undertaken. It will demand a new layer of the risk assessment questions as well as additional mitigation methods to be developed along with further technical development. Any number of separate activities can be imagined incorporated in the app as well.

The current version of the application gives the users access to guidelines and restrictions. But it is not the only information that AECO members need to address to operate in the Arctic. Both AECO documentation and information currently existing on other platforms, but also other types of local legislation would benefit the expedition cruise industry if easily available in the form of an application. The application can readily easily be expanded to feature additional valuable information with a dedicated **Field Operations Manual** section.

Another section that could be incorporated into the existing platform is the **AECO Cruise Database**. This database is one of the most important AECO features used by members and staff alike during a season. It encompasses the Ships Scheduler which is the site booking and reporting platform. This platform is used to avoid congestion on single sites, gathering of statistics, Post Visit Report logging, etc. The current platform is ageing and there are considerations to update and possibly incorporate this database into the existing application as a third overall section.

Finally, it is likely that the methods developed by AECO can be used for other activities within or outside the tourism industry.