

# GLOBE Clouds

## Background

Clouds affect how much sunlight is being absorbed by the earth and how much heat is escaping back into space. GLOBE Clouds <https://observer.globe.gov/> is an international science and education programme in which citizen scientists report cloud observations from sites all over the world. Only few observations have been made in Antarctica. By recording cloud cover, height and type timed to NASA satellite flyovers, we can help scientists fill this gap and help to understand how clouds will respond to a changing climate. Observations are sent to NASA for comparison to similar information obtained from satellites.

## How can you/guests participate?

GLOBE Clouds is a great project to educate guests about our skies and the many clouds we typically encounter during our voyage. An observation takes no longer than 10 min and can be done while at sea, out in the Zodiac or during a landing. Observations should be made at the same time as a satellite is flying over. This usually happens 2-3 times a day and you can make as many observations as fit into the schedule.

The project should be led by an expedition staff member, who will help guests identify cloud coverage, height and type and records the observation via the free GLOBE Observer app on a smartphone/tablet. No internet connection is required at the time of the observation (NOTE: an account must be created before first use, see below). Have your smartphone's/tablet's GPS enabled, then open the app to obtain the GPS location – you cannot continue without a valid GPS position. At the end of the observation, the app allows observers to submit pictures that are on high demand from researchers to compare with satellite observations. The Globe Observer app stores the data on the smartphone/tablet and the data can be sent to NASA once network connectivity is regained.

## Training and equipment required

This project requires a bit of pre-season training. The leading expedition staff member has to make him-/herself familiar with the app and different cloud types/heights. All observers should become familiar with the INTRODUCTION TO GLOBE and CLOUDS training modules (see resource material below) and begin observing at home for practise. More training modules can be found on the GLOBE Observer training website <https://observer.globe.gov/training/clouds>.

Pre-season or on turnaround days, the leading expedition staff member will need to download satellite flyover times to correspond to your company's tentative itinerary. Flyover times for the Antarctic Peninsula, the Falkland Islands (Malvinas) and South Georgia are updated regularly throughout the season and can be downloaded via <http://iaatocitizenscience.online/globeclouds>. Alternatively contact the Polar Citizen Science Collective ([info.polarcollective@gmail.com](mailto:info.polarcollective@gmail.com)).

The equipment needed for this project includes

- Smartphone/tablet
- GLOBE Observer app - download before sailing
  - Free app available for Android and iOS <https://play.google.com/store/apps/details?id=gov.nasa.globe.observer> / <https://itunes.apple.com/us/app/globe-observer/id1090456751?mt=8>
  - Create an email account such as [yourcompanyglobe@gmail.com](mailto:yourcompanyglobe@gmail.com) and use this email account to sign up for a GLOBE account. This way the GLOBE account is not linked to a personal email address. NASA notification emails will arrive here, any observer can access it and all of the company's observations are stored in one central place
  - When creating your GLOBE account, please use the referral code: polartourism
- It is beneficial to have laminated cloud cheat sheets that can be used by guests during the observation (see resource material below).





## Scientific research questions

Cloud and sky observations over the ocean are unique and impactful. Although the app guides you to take photographs on an angle, the team would like photographs of the horizon to observe clouds over the ocean. The team is also trying to detect how often do haze layers occur over the ocean surface. Observations of lenticular clouds or lense-type clouds generated over the mountain peaks are also of interest.

Photo taken by United States Citizen Science on 2021-12-23 at 20:34:00 UTC.

## Expected results/feedback

The collected cloud observations are building a long-term database of cloud cover/type across the Southern Ocean that will be used by scientists to study how clouds are affected by climate change.

- Your company's observations can be viewed via the GLOBE visualization system <https://vis.globe.gov/clouds>
- Photographs submitted with each cloud report are sent to NASA GLOBE CLOUD GAZE on the Zooniverse online platform. Volunteers on the Zooniverse platform can identify cloud types and cloud cover in each photograph. NASA GLOBE CLOUD GAZE is a great pre-season way to test your cloud knowledge and as a way to keep engagement once the tour season is over. <https://www.zooniverse.org/projects/nasaglobe/nasa-globe-cloud-gaze>

## Resource materials

Detailed project instructions, reference as well as on board presentation materials can be downloaded via the following link <http://iaatocitizenscience.online/globeclouds>

## Scientific project partners

All observations are sent to the NASA Langley Research Center in Hampton, Virginia. The data is stored within the GLOBE Program and freely accessible through the GLOBE visualization system <https://vis.globe.gov/clouds> or the data access tool [www.globe.gov/globe-data/retrieve-data](http://www.globe.gov/globe-data/retrieve-data).

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## Main contact information

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The Polar Citizen Science Collective can also assist ([www.polarcollective.org](http://www.polarcollective.org)).

