GLOBE_secchi_transparency_freshwater
This readme file was generated on 2026-02-12 by Hannah R Mair

GENERAL INFORMATION

GLOBE Secchi Disk Transparency - Fresh Water

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Date of data collection: August 17, 1995 to September 21, 2025

Geographic location of data collection: global

SHARING/ACCESS INFORMATION

Links to other publicly accessible locations of the data:
https://vis.globe.gov/GLOBE/
http://datasearch.globe.gov/
http://api.globe.gov/search/swagger-ui.html

DATA & FILE OVERVIEW

File Name:
GLOBE_secchi_transparency_freshwater.csv

Description: This is a curated dataset of NASA GLOBE observations of fresh water transparency using a secchi disk. Depth observations are made by lowering a secchi disk into the water until it can no longer be seen, or reaches the bottom. After the disk can no longer be seen, it is lowered a further and then raised until it is visible again. The average of these depths is the final transparency depth (transparency_disk_image_disappearance_m). The GLOBE Secchi Disk protocol at the time of publishing this dataset also required that observers record the distance of the observer above the water surface. This value is included in the total depth to disappearance. Since this is not the method which other secchi disk datasets follow, some confusion about the inclusion of the distance above water value led to inconsistencies in the

dataset. As such, we have published this curated dataset which has been cleaned using the methods described below.

METHODOLOGICAL INFORMATION

Description of methods used for collection/generation of data: Data was obtained from the NASA GLOBE API on September 29, 2025 (48408 fresh water measurements). Due to errors in the data entry process, some measurements with issues were removed from this dataset. Some measurements have multiple issues. All data is available through globe.gov.

Cleaning steps taken are as follows:
1. Removed measurements will null depths (n = 28)
2. Removed all measurements with negative depth values. (n = 1783)
3. Removed data with distance above water greater than 5m. (n = 3648)
4. Removed data with no location info. (n = 485)
5. Removed measurements with distance above water equal to disappearance or reappearance depths. (n = 2500)

Note: There are 259 measurements with a difference between disappearance and reappearance depths greater than 2 meters. Many appear to be due to data entry errors, such as misplaced decimal points, however others are likely accurate. Use discretion when working with these measurements.

SUMMARY STATISTICS

Each unique transparency ID number represents a single observation. Each observation can have up to three measurements associated with it.

Number of observations with 1 measurement: 6705
Number of observations with 2 measurements: 711
Number of observations with 3 measurements: 10844

VARIABLES

Number of variables: 54
Number of cases/rows: 40659

Variable List:

latitude
longitude
transparency_id
site_id
userid

usertype

organizationid

measured_at [MM/DD/YYYY 00:00:00 PM]

      Date and time of the observation.

transparency_disk_image_disappearance_m [m]

      calculated average disappearance depth

      ((disappearance - distance_to_surface) + (reappearance - distance_to_surface))/2

transparency_disk_does_not_disappear [TRUE/FALSE]

      True if disk did not disappear. False if disk did disappear.

sample_number

      Number 1 to 3 representing the sample number associated with each transparency_ID.

sample_distance_to_surface_m [m]

      Distance from the observer to the surface of the water.

sample_transparency_disk_image_disappearance_m [m]

      Distance from the observer to disk when it disappeared. This includes the height
recorded in sample_distance_to_surface_m.

sample_transparency_disk_image_reappearance_m [m]

      Distance from the observer to disk when it reappeared. This includes the height
recorded in sample_distance_to_surface_m.

sample_transparency_disk_does_not_disappear [TRUE/FALSE]

      True if disk did not disappear. False if disk did disappear. Same as
transparency_disk_does_not_disappear.

comments

water_body_state

      Normal; Frozen; Dry; Flooded; Unreachable

created_at [MM/DD/YYYY 00:00:00 PM]

      Date and time of the site creation.

updated_at [MM/DD/YYYY 00:00:00 PM]

      Date and time that the site information was last updated.

site_activated_at [MM/DD/YYYY 00:00:00 PM]

      Date and time that the site was activated.

site_version

site_version_date

water_body_name

      User input. Name of water body.

water_body_type

      Salt Water; Fresh Water; Brackish; Unknown

water_body_source

      Pond; Lake; Reservoir; Bay; Ditch; Ocean; Estuary; River; Stream; Marsh/Swamp;
Agriculture; Puddles, Animal or Vehicle Tracks; Other

water_body_bank_to_bank_distance_m [m]

water_body_area_sq_km [KM^2]

water_body_depth_m [m]

water_sample_location

Outlet; Bank; Bridge; Boat; Inlet; Pier

see_bottom_flag [TRUE/FALSE]

True if observer could see the bottom of the water body

bank_material_is_soil [TRUE/FALSE]

bank_material_is_rock [TRUE/FALSE]

bank_material_is_concrete [TRUE/FALSE]

bank_material_is_vegetated_bank [TRUE/FALSE]

bedrock_type_is_granite [TRUE/FALSE]

bedrock_type_is_limestone [TRUE/FALSE]

bedrock_type_is_volcanic [TRUE/FALSE]

bedrock_type_is_mixed_sediments [TRUE/FALSE]

bedrock_type_is_unknown [TRUE/FALSE]

freshwater_habitat_has_rocky_sustrate [TRUE/FALSE]

freshwater_habitat_has_vegitated_banks [TRUE/FALSE]

freshwater_habitat_has_mud_substrate [TRUE/FALSE]

freshwater_habitat_has_sand_substrate [TRUE/FALSE]

freshwater_habitat_has_submerged_vegetation [TRUE/FALSE]

freshwater_habitat_has_logs [TRUE/FALSE]

salt_habitat_has_rocky_shore [TRUE/FALSE]

salt_habitat_has_sandy_shore [TRUE/FALSE]

salt_habitat_has_mud_flats_or_estuary [TRUE/FALSE]

site_comments

old_schoolid

old_siteid

old_versiondate

site_created_at

site_updated_at

depth_difference

Calculated difference between sample disappearance and reappearance depth [m]