



# Hydrological measurements in the GLOBE program

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ISTITUTIO COMPRENSIVO 1 POGGIBONSI, ITALY

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In Omiš, October 13-19, 2024.

## 1. DEFINE STATION (globe.gov)

THEGLOBEPROGRAM SCIENCE Data Entry Training Site Welcome Tamara Banovic

Data Entry Home / OS Josp Pupacic /

### Site Definition

**Add site type**

**Atmosphere**

☐ Atmosphere

☐ Surface Temperature

**Hydrosphere**

☐ Hydrology

**Biosphere**

☐ Land Cover

☐ Greening

☐ Phenological Gardens

☐ Liliacs

☐ Carbon Cycle

**Pedosphere**

☐ Frost Tube

☐ Soil Characterization

☐ Soil Moisture and Temperature

**Photos** →

**Site Name \*** \* indicates a field is required

**Coordinates**

**Latitude \***

☒ North ☐ South

**Longitude \***

☐ East ☒ West

**Elevation \***

Set elevation

**Source of Coordinates Data \***

☐ GPS ☒ Other

### Unknown

Salt Water  
Fresh Water  
Brackish

**Comment**

**Name of Body of Water \***

**Naming Convention** This is the name commonly used on maps. If the body of water does not have a common name, [More](#)

**Water Body Type \***

**Water Body Source**

**Water Sample Location**

**Can you see the bottom?** ☐ Yes ☐ No

**Channel/Bank Material** ☐ Soil ☐ Rock ☐ Concrete ☐

**Bedrock** ☐ Granite ☐ Limestone ☐ Volcanic

**Unknown**

Salt Water  
Fresh Water  
Brackish

Pond  
Lake  
Reservoir  
Bay  
Ditch  
Ocean  
Estuary  
Stream  
River  
Marsh/Swamp  
Agriculture  
Puddles, animal and vehicle tracks  
Other

## My Organizations and Sites



OS Josip Pupacic ORG\_ID: 326130

Add site

+ OS Josip Pupacic (dvoriste skole)

Latitude 43.44309, Longitude 16.6921, Elevation 2m, SITE\_ID: 33417

Edit site | Delete site

+ Cetina (usce)

Latitude 43.4398, Longitude 16.68567, Elevation 0m, SITE\_ID: 33418

Edit site | Delete site

- Cetina (Planovo)

Latitude 43.4466, Longitude 16.6939, Elevation 0m, SITE\_ID: 33419

Edit site | Delete site

### Hydrology

Freshwater Macroinvertebrates ★

New observation

Past observations

Integrated Hydrology ★

New observation

Past observations

+ More (mul)

Latitude 43.4419, Longitude 16.6949, Elevation 0m, SITE\_ID: 33420

Edit site | Delete site

+ Smokva - školski vrt (Omiš)

Latitude 43.44309, Longitude 16.6921, Elevation 2m, SITE\_ID: 33424

Edit site | Delete site

+ PŠ Kučiće

Latitude 43.4323, Longitude 16.8067, Elevation 222m, SITE\_ID: 33493

Edit site | Delete site

+ TLO (dvoriste škole)

Latitude 43.44309, Longitude 16.6921, Elevation 2m, SITE\_ID: 33494

Edit site | Delete site

## 2. DATA ENTRY AND FINE MEASUREMENT

### Integrated Hydrology *Creating*



Measured at date and time (24hr)

2023-09-29



09:00



☐ UTC  
☒ Local

[Get Current UTC Time](#)

Water body state

Normal State

Your Local (N/A) time converted to UTC time is 2023-09-29 07:00

What Does Your Sky Look Like? \*

Observability

ATMOSFERA

No Observable Clouds/Contrails

Clouds/Contrails Observable

Clouds/Contrails >25% Obscured

What percentage of the whole sky is covered by clouds/contrails? \*

Overcast 90 To 100 Perce

High Level Clouds

No high level clouds observed

Which high level clouds/contrails are present?


No mid level clouds observed

Mid Level Clouds

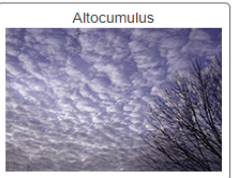
Which mid level clouds are present?

Middle Of The Sky

Altostratus



Altostratus



What percent of mid level sky is covered with clouds?

Scattered 25 To 50 Percer

What is the visual opacity of the mid level clouds?

Translucent

Scattered 25 To 50 Percer

Few 1 To 10%

Isolated 10 To 25 Percent

Scattered 25 To 50 Percent

Broken 50 To 90 Percent

Overcast 90 To 100 Percent

Translucent

Translucent

Opaque

Translucent

Transparent

## Air temperature, pressure and air humidity

[illegible]

### Task 1: Clouds and cloud cover






1. What does the sky look like? Write an X in the corresponding box.

No Observable Clouds/Contrails	Clouds/Contrails Observable	Clouds/Contrails >25% Obscured
		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. How much of the sky is covered by clouds? Circle the correct answer.

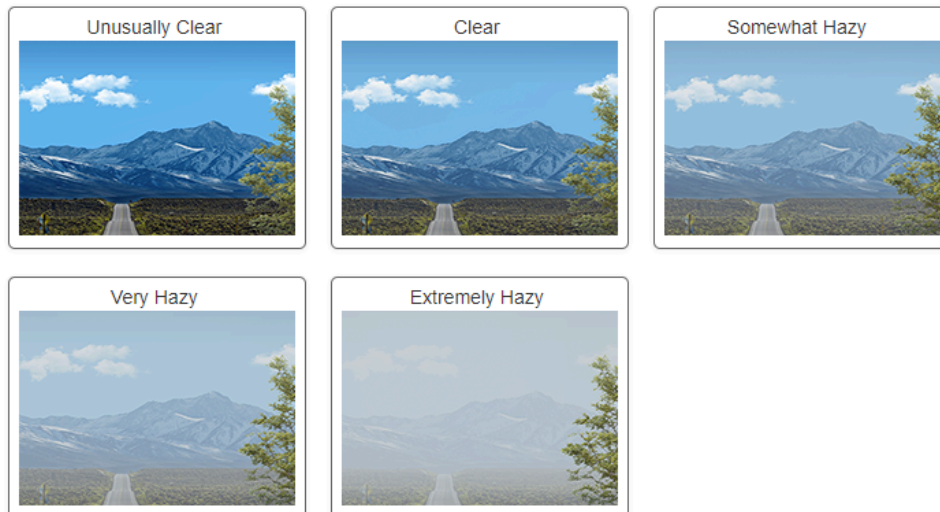
- a) **Few** 1 To 10 %
- b) **Isolated** 10 to 25 %
- c) **Scattered** 25 To 50 %
- d) **Broken** 50 To 90 %
- e) **Overcast** 90 To 100 %

3. Estimate the color of the sky. Write an X in the corresponding box.

Deep Blue	Blue	Light Blue	Pale Blue	Milky
				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Estimate the visibility of the sky. Write the answer on the line.

\_\_\_\_\_



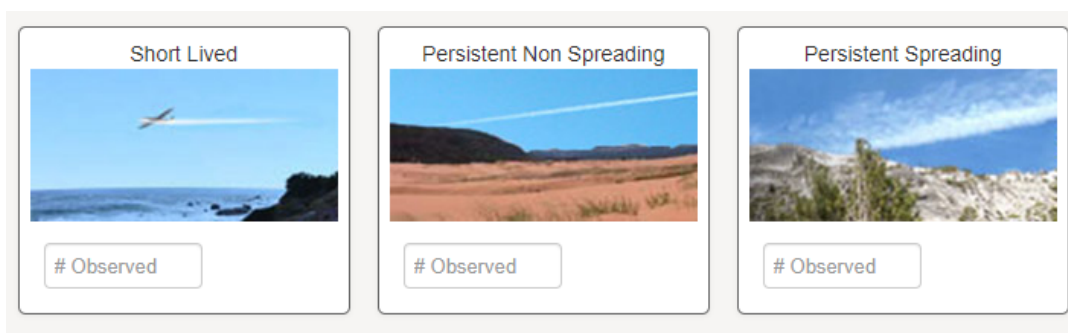
5. Use the cloud map to determine the types of clouds and their percentage in the total cloud cover.

a) Types of **high clouds**:

---

Can you spot **the contrails** (CONTRAILS)?

Enter the number of observed contrails with an appropriate description.




---

Estimate the opacity of high clouds and contrails.

- a) OPAQUE
- b) TRANSLUCENT (partially transparent)
- c) TRANSPARENT

b) Types of **middle clouds**:

---

Estimate the opacity of the middle clouds:

- a) OPAQUE
- b) TRANSLUCENT (partially transparent)

c) TRANSPARENT

c) Types of **low clouds**:

---

Estimate the opacity of low clouds:

- a) OPAQUE
- b) TRANSLUCENT (partially transparent)
- c) TRANSPARENT

### **Task 2: Temperature, pressure and air humidity**

Measure the air temperature using a thermometer.

The air temperature is \_\_\_\_\_ °C

Read the air pressure using a barometer, and the air humidity using a digital hygrometer.


You can access the data of the digital weather station by scanning the QR code.



Air pressure is \_\_\_\_\_ hPa.

Air humidity is \_\_\_\_\_ %.

## TRANSPARENCY OF WATER

 Water Transparency

[Expand/Collapse](#) | [Remove](#)

**Secchi Disk Test 1**

Distance from observer to...

☐ Secchi Disk reaches the bottom and does not disappear.

to water surface

m

where disk disappears

m

where disk reappears

m

Add

**Transparency Tube Test 1**

cm

☐ Greater than depth of Transparency Tube?

Add

Comments

### Transparency Tube (turbidity tube)



Measuring water transparency using a turbidity tube - video



## WATER TEMPERATURE

 Water Temperature

[Expand/Collapse](#) | [Remove](#)

Measured with \*

Alcohol-filled Thermometer

Probe

Comments

### Measurement procedure

1. Immerse the thermometer in water to a depth of 10 cm.
2. Hold it under water for 3-5 min.
3. QUICKLY READ the temperature (if possible while the thermometer is in the water) so that the liquid level in the thermometer is at eye level!
4. Immerse the thermometer in water again and read the temperature after
5. Determine the mean value of at least three measurements!
6. The read temperatures should not differ by more than 0.5 °C.

### Task 4: Water temperature

Measurement	Temperature °C
1.	
2.	
3.	



Average temperature value: \_\_\_\_\_ °C. Water thermometer



Measuring water temperature - video

### pH- VALUE OF WATER



pH

[Expand/Collapse](#) | [Remove](#)

Measured with \*

pH Paper

pH Meter

Comments

#### a) pH paper

1. Rinse the container with the water sample at least 2 times.
2. Fill the container halfway with the water sample.
3. Immerse the indicator paper in water and keep it in the water according to the manufacturer's instructions.
4. Remove the paper from the water and compare it with the test strip on the box or roll.
5. Find the area where the colors match best and read the pH value.
6. Make several measurements and calculate the mean value (max. difference 1 pH-unit).

#### b) Determination of the pH value with a pH meter or pH pen

1. Remove the cover from the electrode, rinse it with distilled water and wipe it dry.
2. Immerse the electrode in the glass with the water sample, mix and wait for the value to stabilize.
3. Read the pH value.
4. Repeat the process and calculate the mean value.

5. Values must not differ by more than 0.2 units.



### Measurement of pH value

### Task 5: pH-value of water

Measurement	pH
1.	
2.	
3.	

Average pH value: \_\_\_\_\_

## ELECTRICAL CONDUCTIVITY

⚡

Electrical Conductivity

Expand/Collapse

Remove

Temperature of water sample being tested

°C

Conductivity of standard

μS/cm

1\*

Conductivity

μS/cm

Comments

Add

## Procedure

1. Remove the cover from the conductivity meter.
2. Rinse the electrode with distilled water from the syringe bottle.
3. Fill the beaker with the water sample.
4. Immerse the electrode in the water sample.
5. Stir gently for a few seconds to stabilize the value on the display.
6. Read and record the measured value: \_\_\_\_\_
7. The measurements need to be repeated 2 more times. The values should be within  $\pm 40 \mu\text{S}/\text{cm}$ .
8. Rinse the electrode with distilled water and wipe it with soft paper.
9. Turn off the conductivity meter and put the cap back on the electrode.

### Presence of nitrates and nitrites



Set za određivanje nitrata i nitrita u vodama