RIVER CITIES ALLIANCE
A city led movement

NAMAMI GANGE

National Institute of Urban Affairs

WATER & ENVIRONMENT VERTICAL

unesco

DIAGNOSTIC TOOL

MANUAL

Please visit the following link to access the web-tool:

There are three ways to login to the main interface from where we can start analysing a water body. These include :-

1

By clicking on the '**Register**' option, you create login credentials for accessing the tool using your email id and password which would be used every time you login. The data will be saved in your profile as you start analysing waterbodies and you can access it any time you login.

2

Sign in with Google can also be used which is an easy process if you are already using Gmail on your browser. This basically creates a profile id using your Gmail credentials.

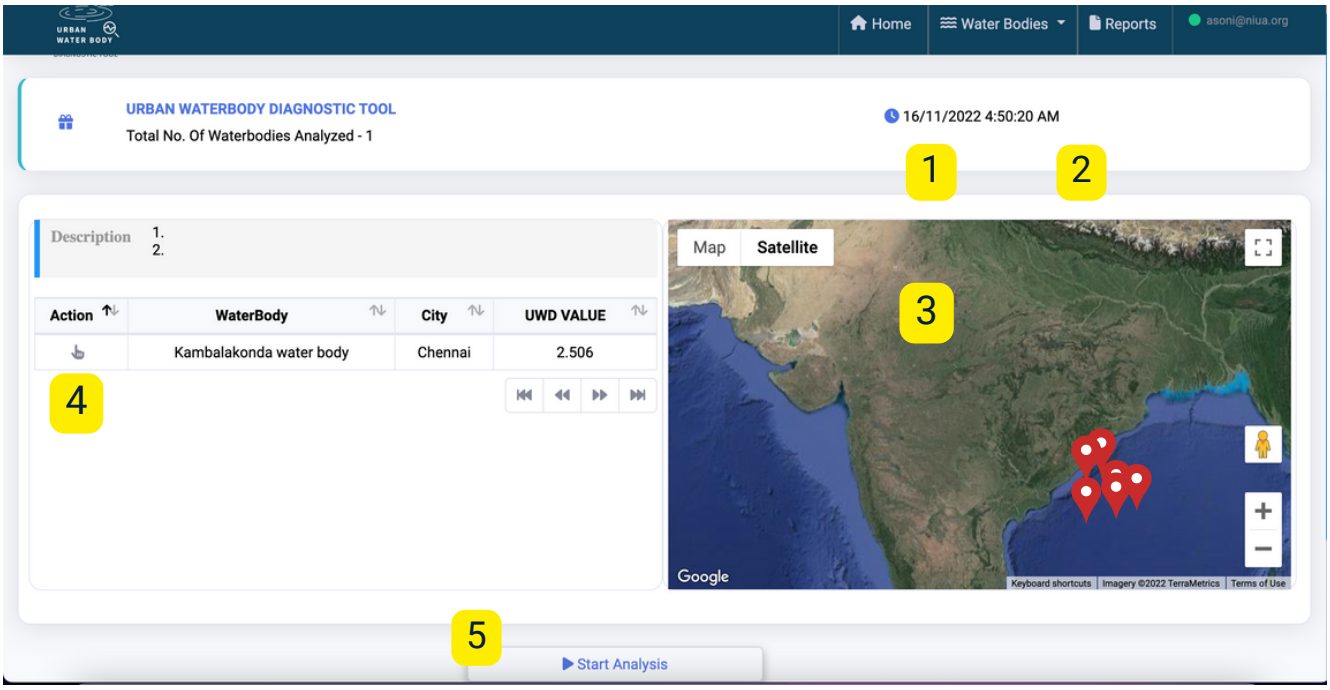
3

Using '**Guest Login**', you can login without registering your email and run a quick analysis, but your analysis would not be saved and cannot be accessed later. It is encouraged to create an account so as to keep a database of previously analysed waterbodies.

Home page

Once you login, you will be directed to the user homepage where you can:

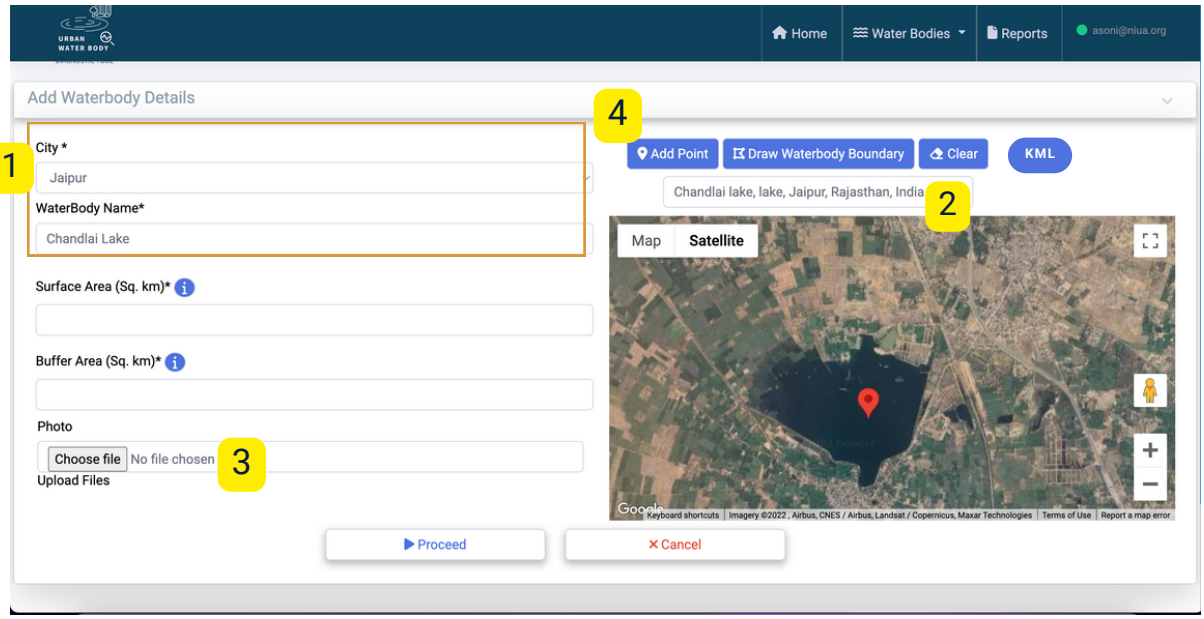
1. **Access** tab shows previously added or analysed waterbodies on this web tool by you.
2. D**ownload** auto-generated reports for waterbodies analysed on the tool.
3. View the location of previously analysed waterbodies on the map.



4. Have a quick view of previously analysed waterbody from your account along with their indicator values.
5. **'Start Analysis'** of a new waterbody by clicking on the button.

Analyzing waterbody : Step- 1 (Primary details of waterbody)

On the first page of the analysis, you are required to enter basic details of the water body. and mark the location of the waterbody. Follow the steps as shown below. Please make sure the waterbody name entered is unique to the previously analysed waterbody.



1. Add city and waterbody name in the respective fields.

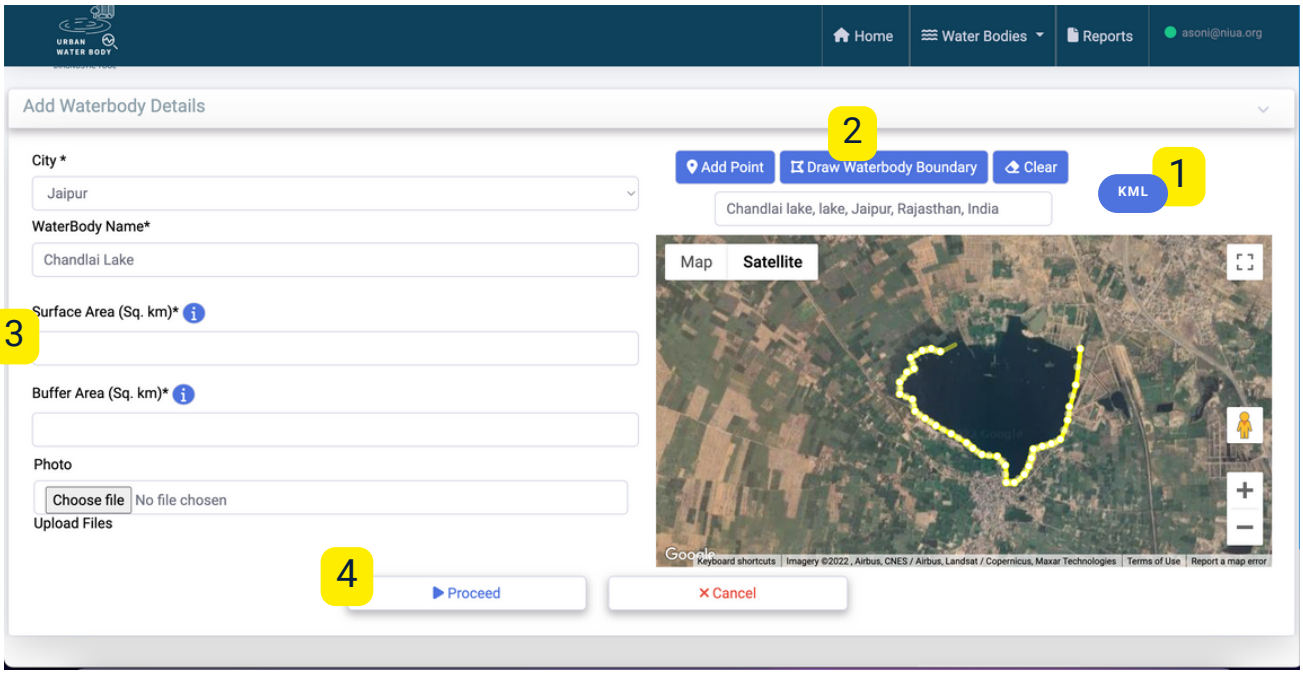
2. Search the lake location by name or coordinates if available and you will be zoomed in to the lake on the satellite map as shown in figure above.

3. Choose a jpg file If you want to upload an image of the waterbody for your own reference, which will be added to the report as well as your dashboard.

4. Select 'add point' and then click on waterbody location on the map to mark it on the map.

Surface area of waterbody:

The surface area of the water body can be entered in one of the three ways:



1

Uploading a kml file:

If Kml* layer is already available with the city generated from satellite image/site survey using GPS survey; that can be uploaded.

*kml (Keyhole Markup Language) is a file format used by Earth browsers like Google Earth to show geographic data.

OR

2

Drawing on the map:

The tool comes with an advantage of digitising the map on the webpage itself. You can draw the respective waterbody on the adjacent map so the tool automatically calculates the surface area according to the polygon.

OR

3

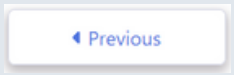
Numerical Value Entry:

To manually input the surface area, you may utilise the city's existing database or Revenue Department's official data or any other reliable data you may already have.

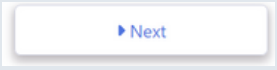
The tool **automatically calculates** the buffer area of the water body for kml files, but it is also possible to manually input the numerical value of the buffer area. For water bodies under 10 hectares, the buffer area is 9m from the edge of the water body, while for those beyond 10 ha, the buffer is 30m.

4 Once all the required details are entered on this page, click proceed and the waterbody will be added to the database and the analysis can be started.

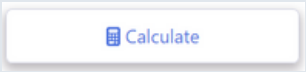
THINGS TO KEEP IN MIND USING THIS TOOL



to move back to the previous indicator



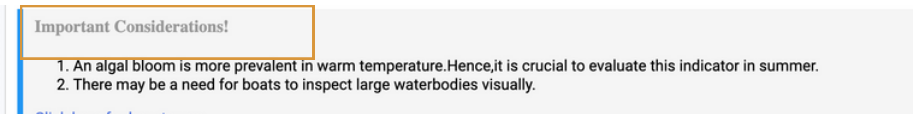
to move to the next indicator



to calculate the respective indicator score
Make sure you click calculate button after every data entry is final.

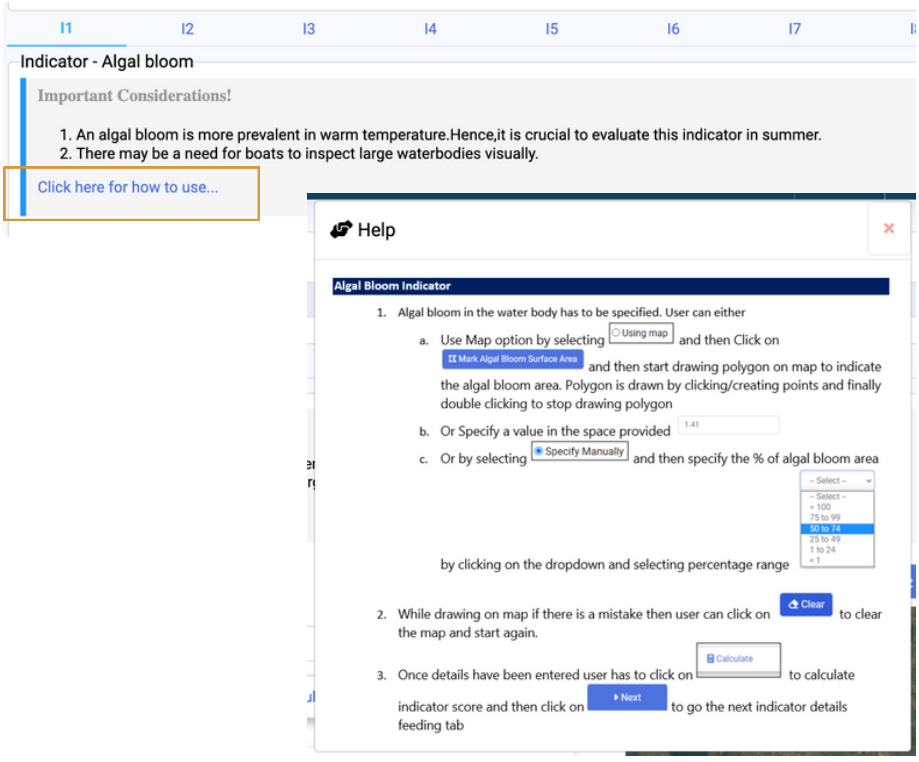
Important Considerations

This section displays certain information on each indicator page that should be taken into account while doing the analysis.



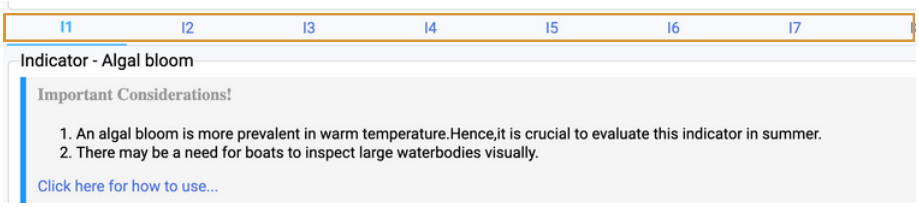
how to use

How to use would step-by-step instructions on how to analyse and put data for each indicator.



Indicator bar use

You may just click on the corresponding indicator number, such as I1 I2, and so on, to move to any indicator.

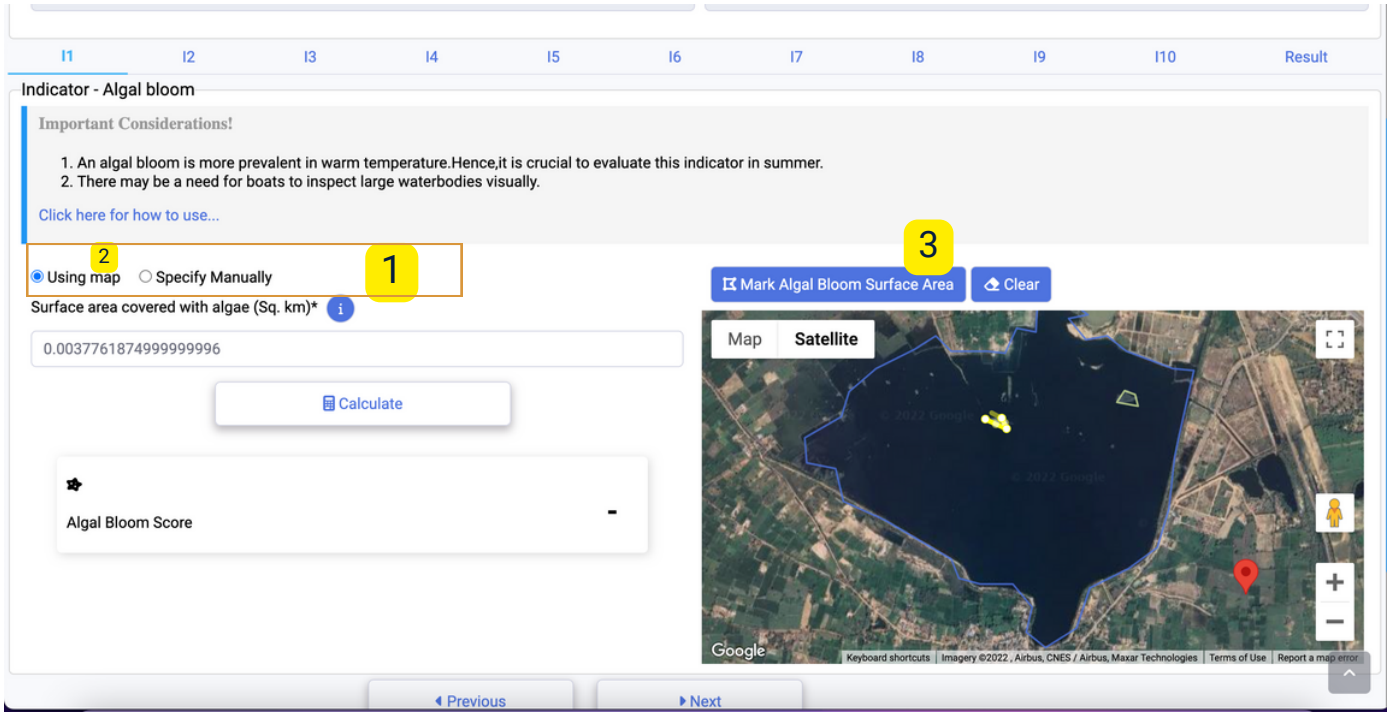


Analyzing waterbody : Step- 2 (Indicator wise data Input)

After adding the waterbody to the database, you will reach indicator-wise input page. indicators are numbered as per the 'urban waterbody diagnostic tool'. Please refer to the manual in case of any doubt in analysis. Link to the document:

HTTPS://UNESDOC.UNESCO.ORG/ARK:/48223/PF0000381242.LOCALE=EN

Indicator 1: Algal Bloom and Floating Macrophytes



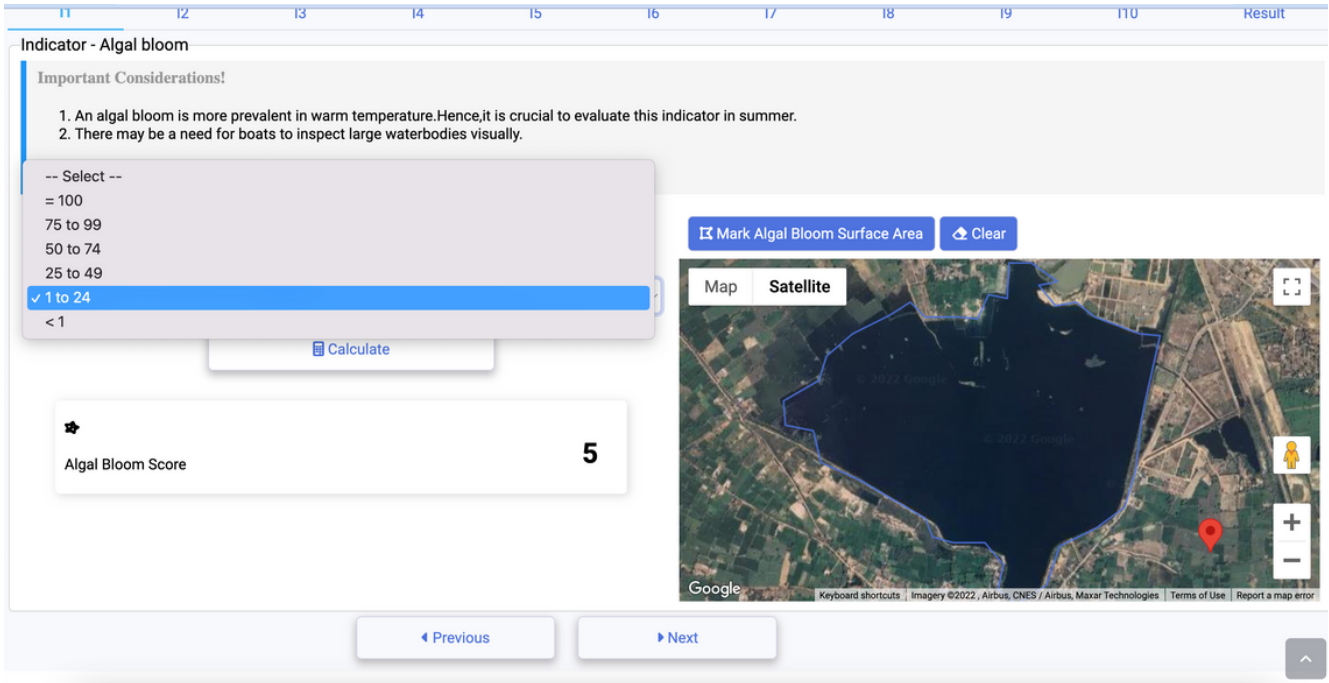
1. We can calculate algal bloom and macrophytes on the surface of the water body either using map where we mark area covered with algal bloom/ macrophytes on map or **estimated percentage range can be entered as observed on site.**

2. select one of the options. For using the map, please mark the area as observed on site using the map. The area will be automatically calculated. Then click calculate to get the indicator score.

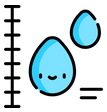
3. Use buttons for marking area on map. If there is any error, please clear the map and redraw the polygon.

Selecting estimated percentage range that can be entered as observed on site:

Select *specify manually* and select the observed range. Then click calculate to get indicator score.

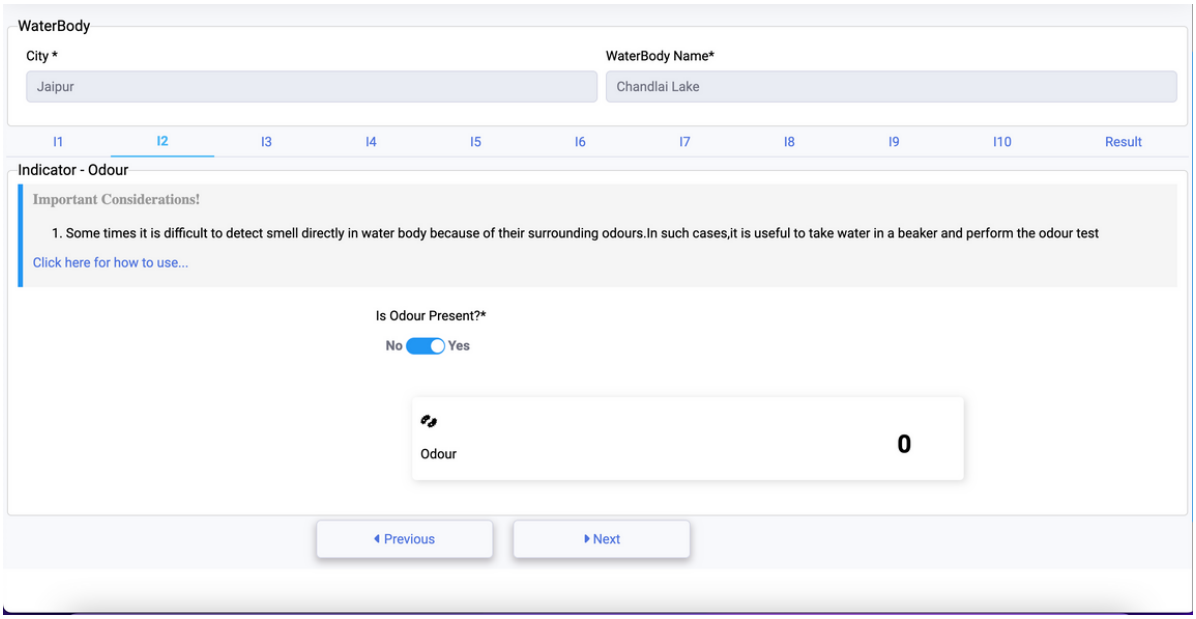


Once you see indicator score, click on next indicator to proceed.



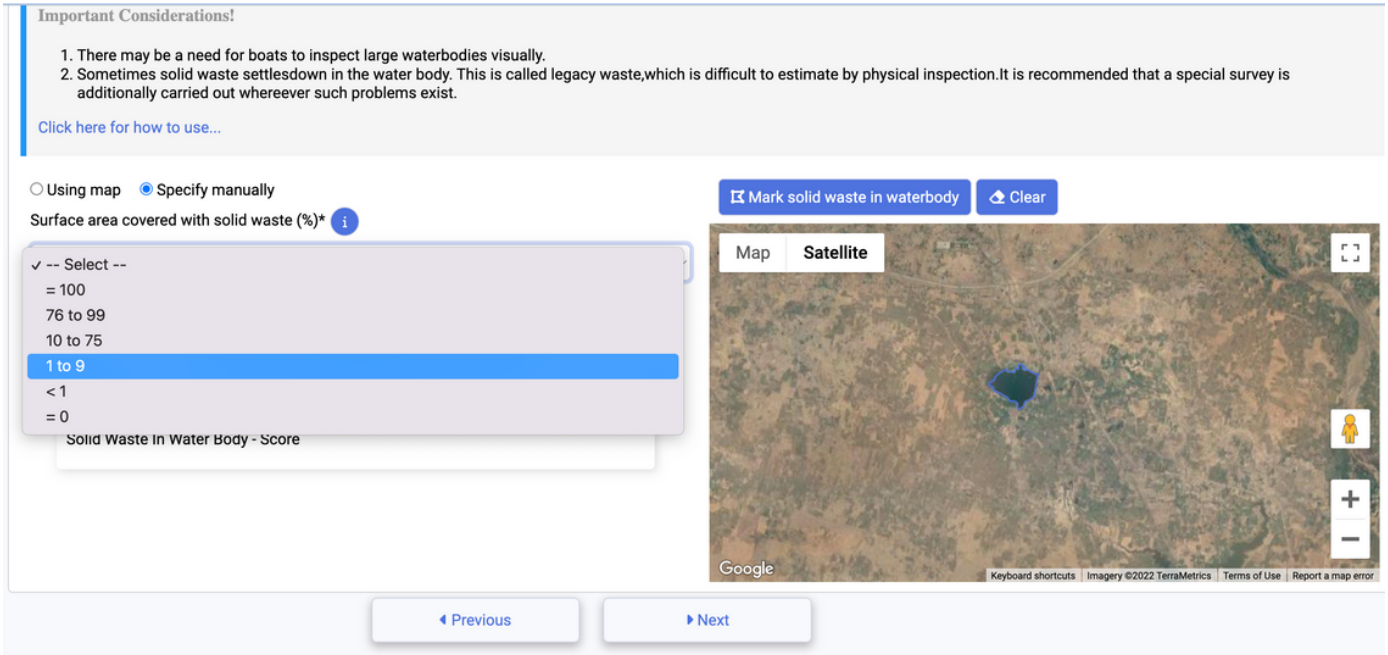
Indicator 2: Odour

Click yes if there is a presence of foul smell at the water body or else no and Click next.



Indicator 3: Surface Area covered with solid waste

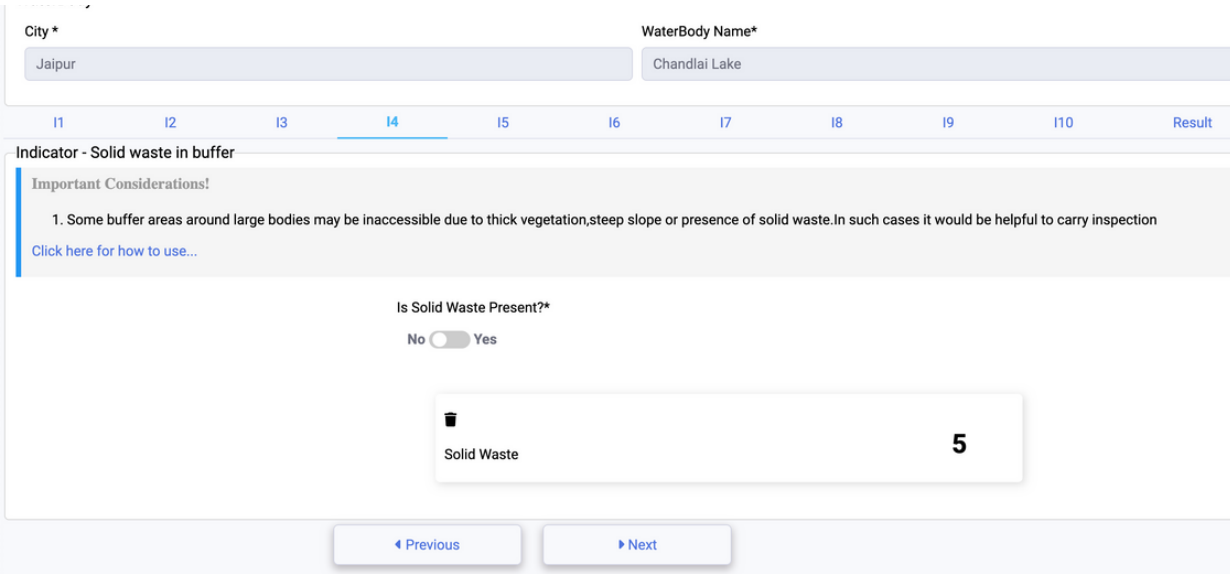
Similar to the process followed in indicator-1, We can calculate surface covered with solid waste either using map where we mark the area on the map or estimated percentage range can be entered as observed on site using specifying manually. Then click calculate to get the indicator score.



Indicator 4: Solid Waste in Buffer

Solid waste in the buffer includes construction and demolition waste, in addition to domestic waste.

Click *yes* if there is a presence of solid waste in buffer or else no and Click *next*.

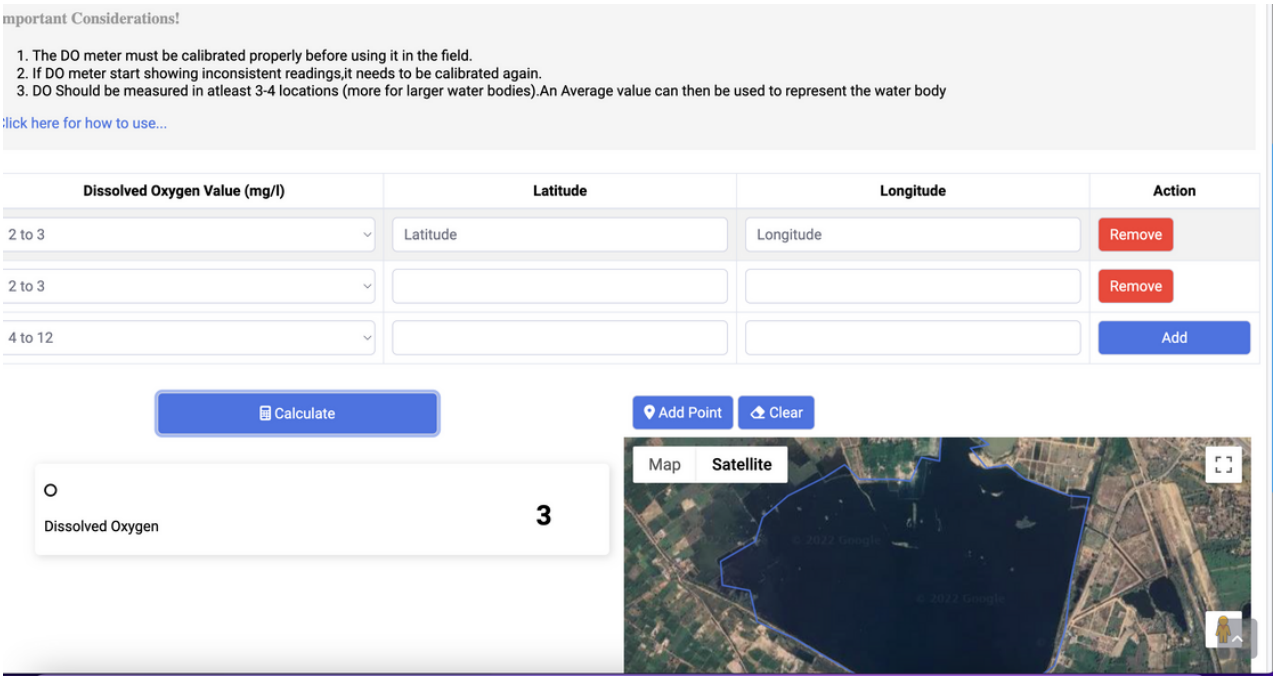


Indicator 5: Dissolved Oxygen Value

Adding DO value without location: (For water bodies with small. surface area , < 10 Ha)

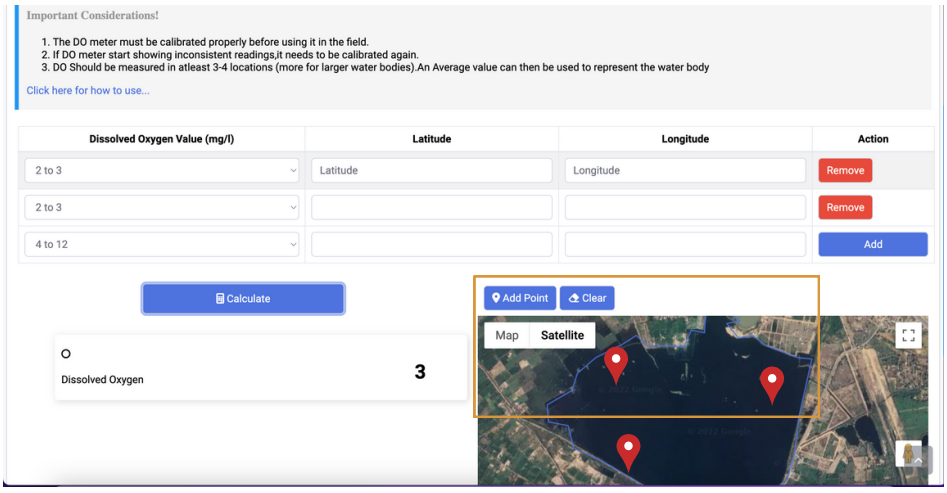
Select DO range from the drop-down menu and click add to add a new value. Add at least 3 values to calculate the indicator score.

The DO can be measured from the site using DO meter and the location at which the sample was collected needs to be recorded on GPS enabled device.



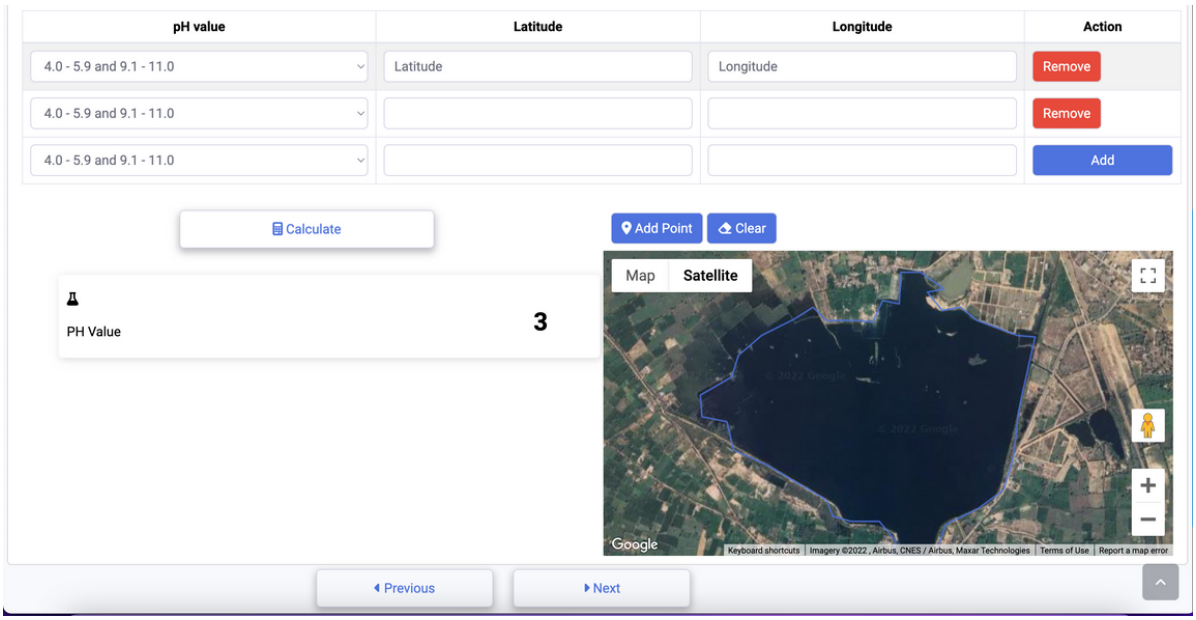
Adding DO value location: (For water bodies with large surface area , > 10 Ha)

Select DO value from drop-down menu, then click add point to mark location of the sample. Now select 'Add' and add at least 3 values to calculate the indicator score. Click *next* to proceed.



Indicator 6: pH Value

Like DO value calculations, a similar process will be followed for the calculation of pH value indicator where if the waterbody is greater then 10 Ha, then location should be marked else add pH values without location and click calculate for generating indicator score. Click *next* to proceed.



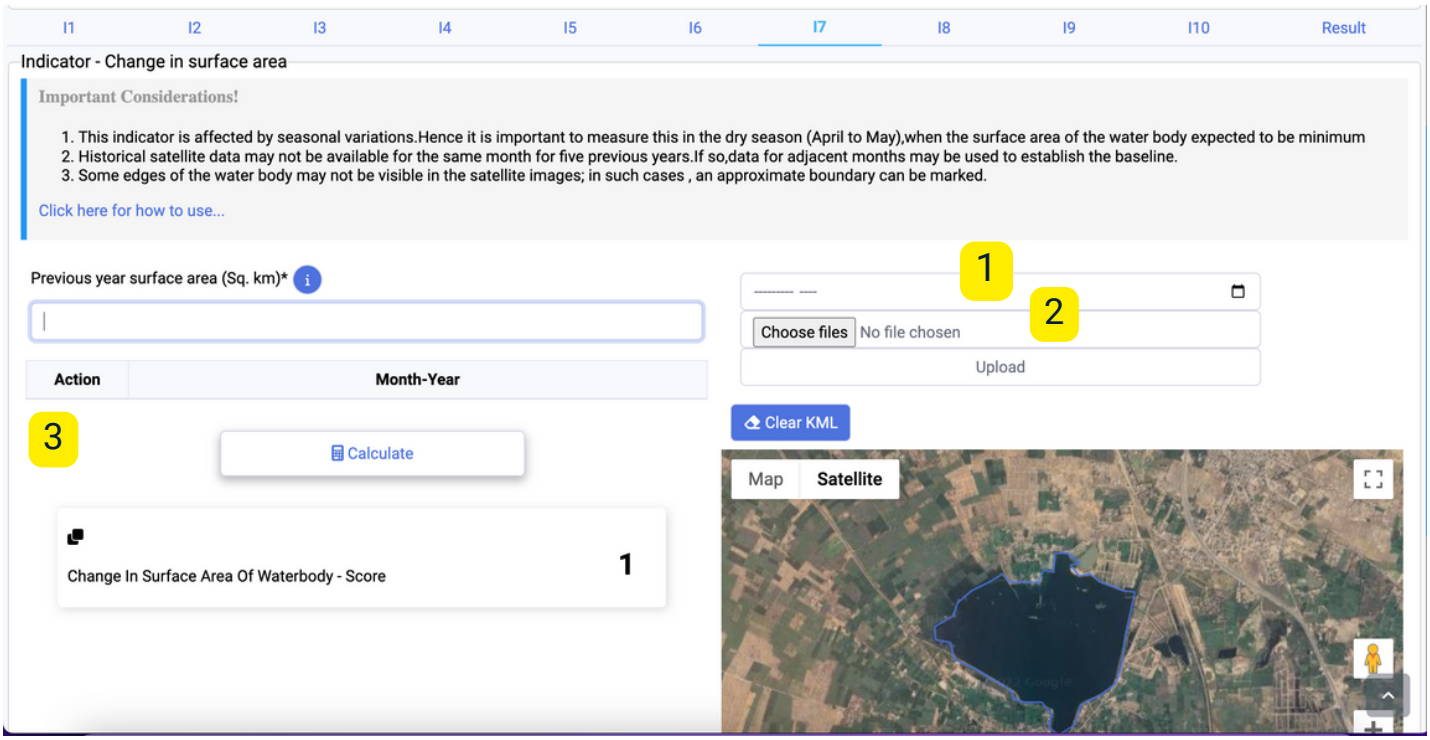
Indicator 7: Change in Surface Area of the Water Body

Please enter the surface area of waterbody as per official record/ land revenue records in the field '**baseline area record**'.

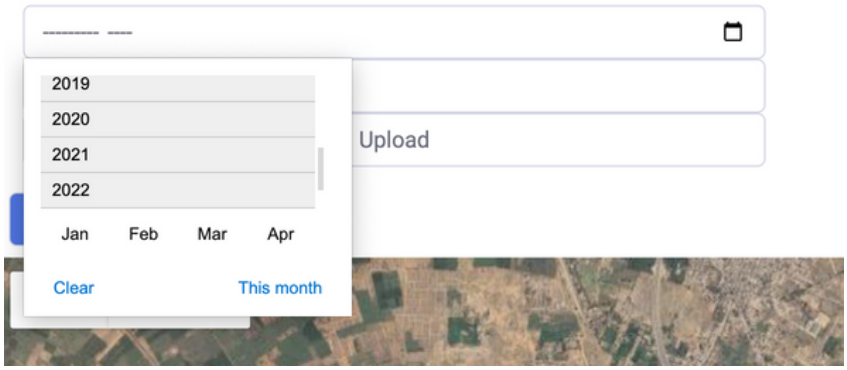
If official records are not available, then please do historical satellite image analysis on google earth and create kml layers for previous years.(If possible last 5 years).

The process to create kml layers of historical timelines is shown in Annexure-1.

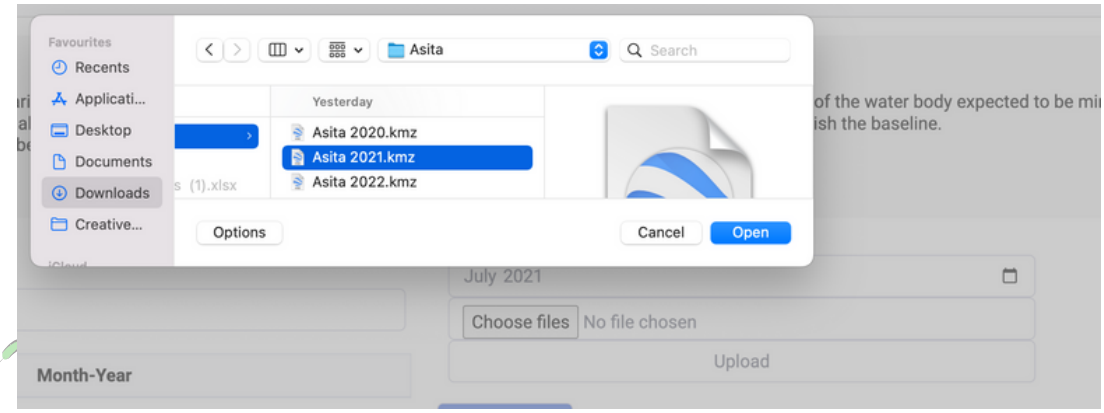
Once kml layers are generated, please start the uploading process as shown below:



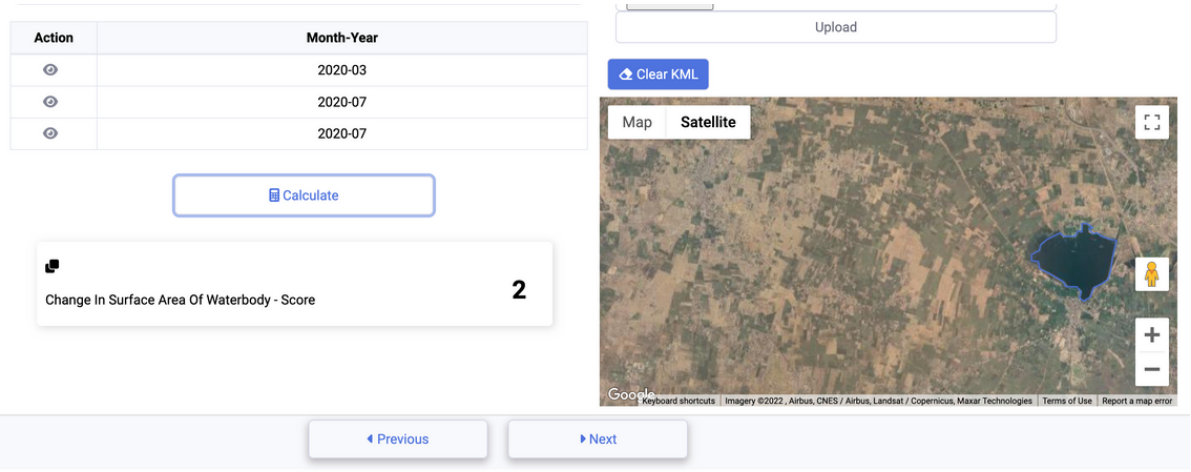
1 Select year and month of satellite kml layer.



2 Choose the file and upload by clicking upload button.



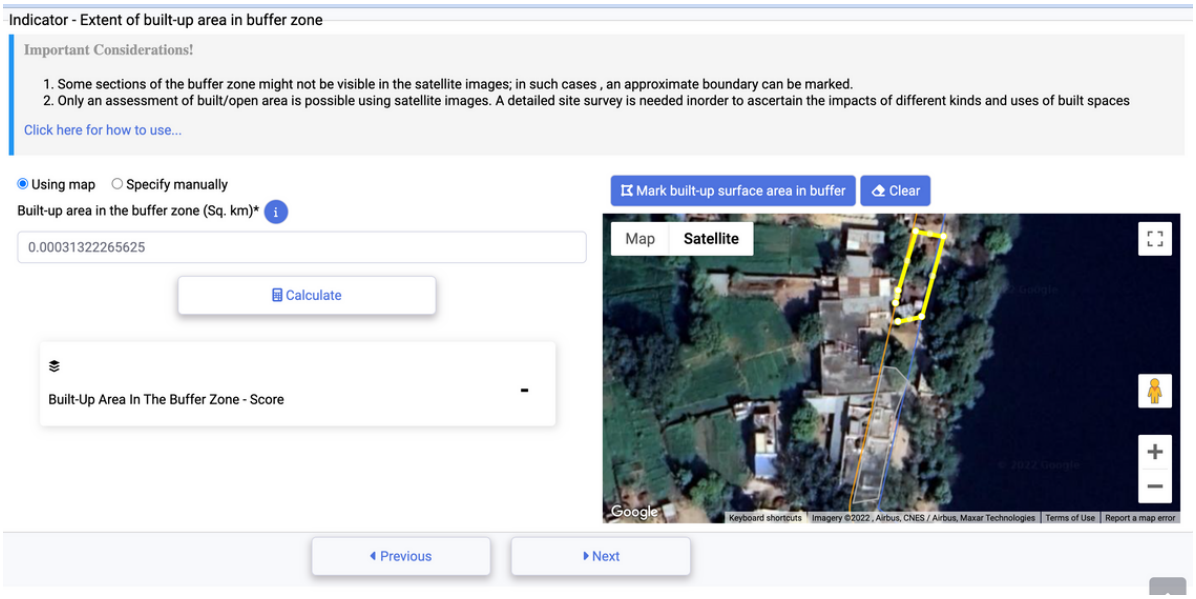
3 Here you can see the years for which kml layers are uploaded. once all available kml layers are uploaded, click calculate button for generating indicator value. Click next to proceed to indicator 8.



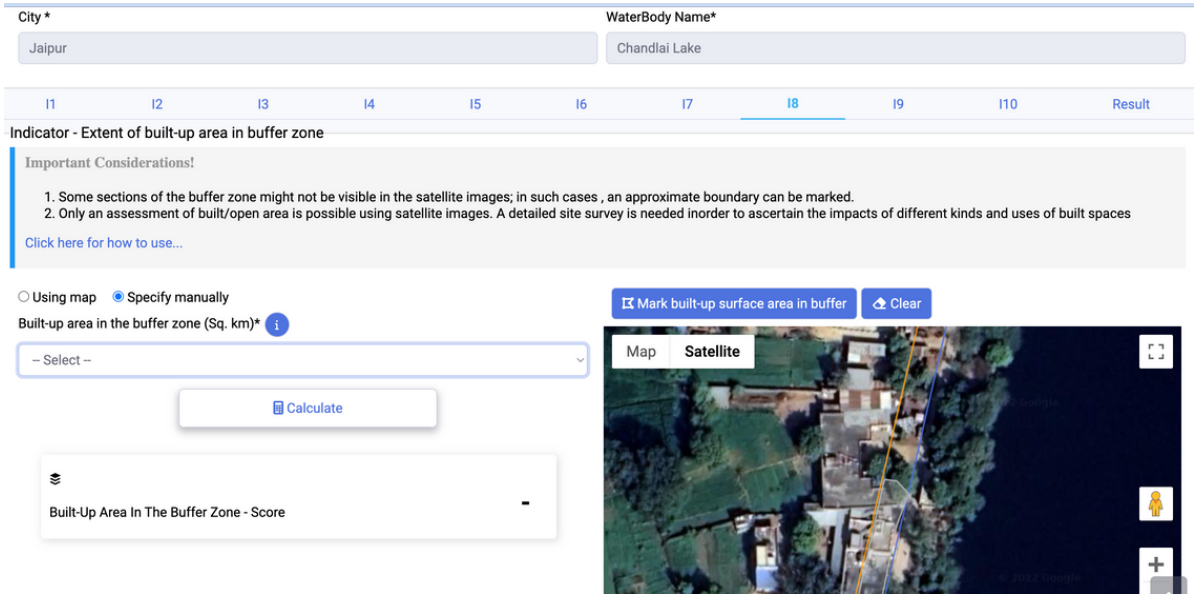
Indicator 8: Extent of built-up in the buffer

Extent of built-up area in the buffer zone can be analysed by marking built-up area on the map as well as specifying the percentage range of the built-up area as observed on the site.

We can mark multiple area on buffer zone which is already shown on map with orange line. Select *calculate* to generate indicator score.

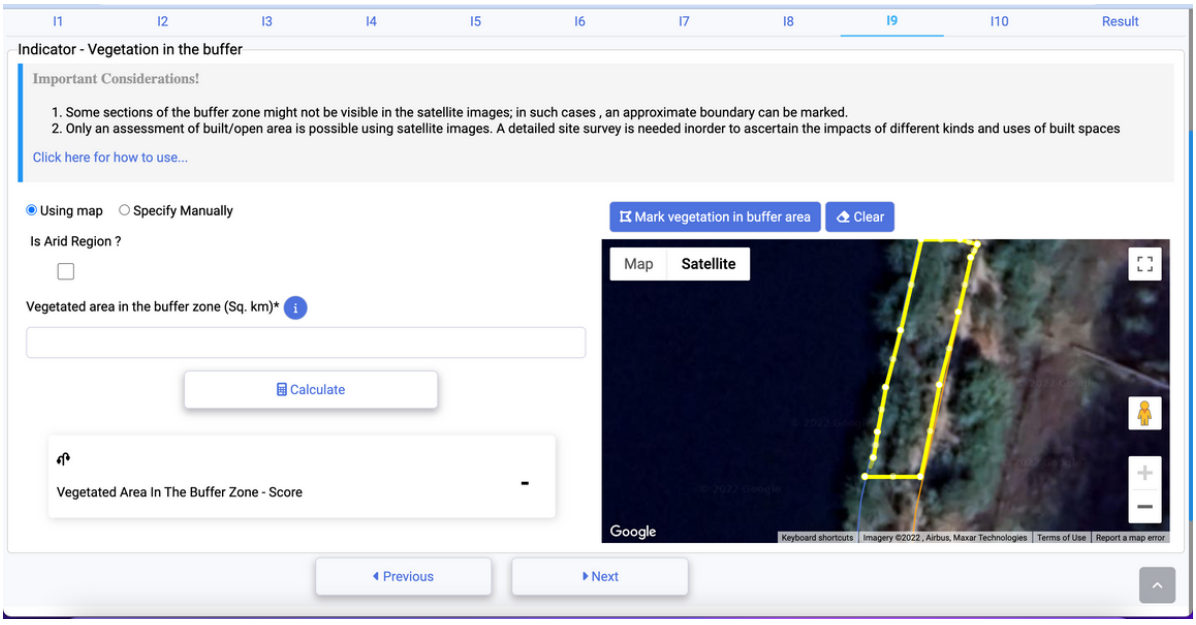


You can also specify the percentage range of the built-up area manually as shown in the image below. Post this, Click *calculate* and then *next* to proceed to next indicator.



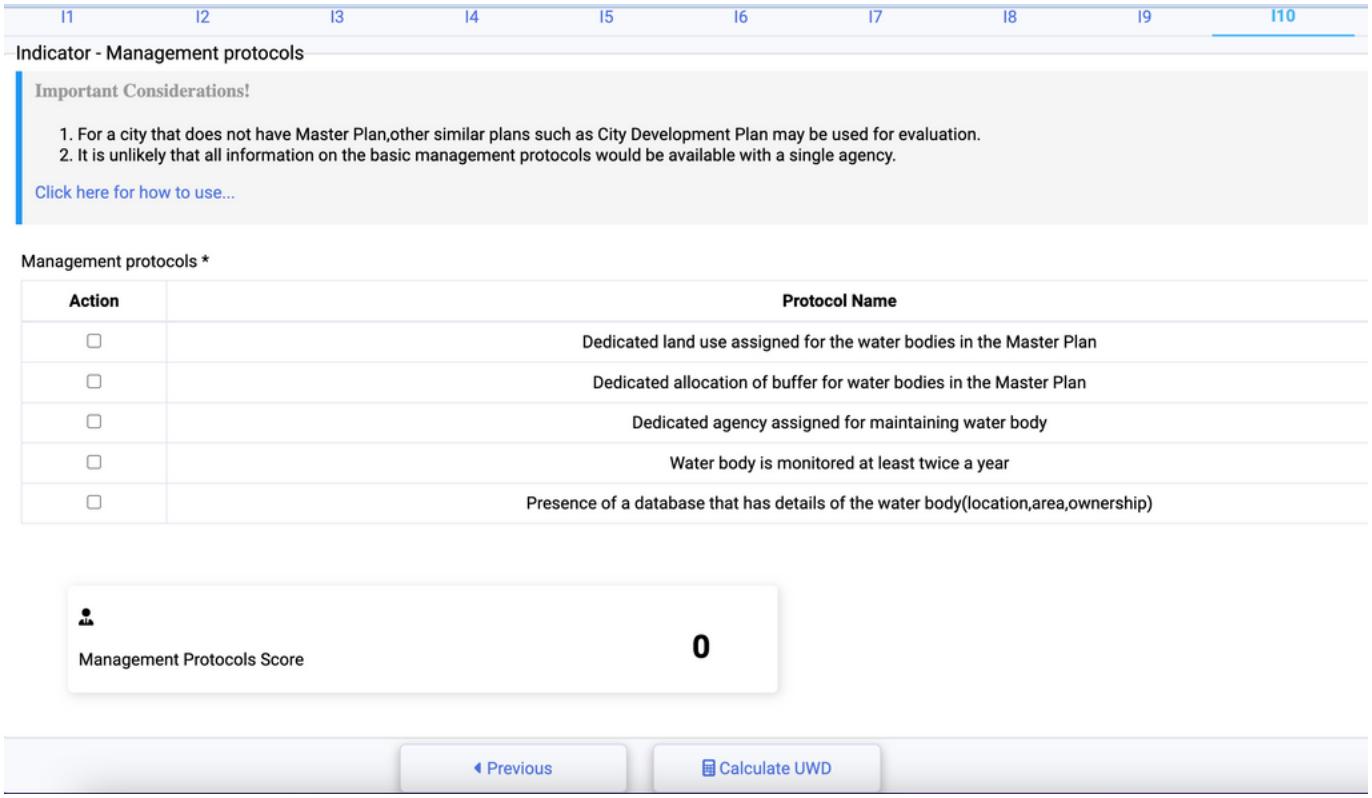
Indicator 9: Extent of vegetation in the buffer

The extent of vegetation in the buffer is calculated in a similar manner as the extent of built-up based on the observation on site in the previous step. After marking the area or adding the value range, press *calculate* to generate the indicator score and click *next* to proceed to 10th indicator.



Indicator 10: Management Protocols

Mark the checkboxes for the management indicators that are being implemented or adapted by the city already. Once they are marked, the indicator value will be automatically calculated.



Select 'Calculate UWD' to calculate UWD value of the waterbody and go to result page.

Analyzing waterbody : Step- 3 (Results)

The result page is generated once we click on 'Calculate UWD'. The detailed result of the waterbody is shown in the form of a table with an indicator score with a corresponding colour for each indicator and overall UWD value.

The interpretation of the colour would be shown on the report for the city to prioritise on the major heath parameters of the water body.

I1 I2 I3 I4 I5 I6 I7 I8 I9 I10 Result

Result

URBAN WATER BODY DIAGNOSTIC TOOL

City Name : Jaipur

WaterBody Name : Chandlai Lake

Indicator Type	Indicator	Value	Score	Weight	Weighted Score
Physical Dimension	Algal Bloom	1 to 24	4.00	0.08	0.32
	Odour	Yes	0.00	0.08	0.00
	Solid Waste water body	1 to 9	3.00	0.15	0.45
	Solid Waste in buffer	No	5.00	0.09	0.45
Water Quality Dimension	Dissolved Oxygen	3.00	3.00	0.16	0.48
	pH value	3.00	3.00	0.09	0.27
Water Quantity	Change in Surface Area	46.34	2.00	0.10	0.20
Management Dimension	Built up in Buffer Area	1 to 5	4.00	0.08	0.32
	Vegetation in Buffer Area	71 to 100	5.00	0.04	0.20
	Management Protocol	3	3	0.12	0.36

UWD Value 2.76

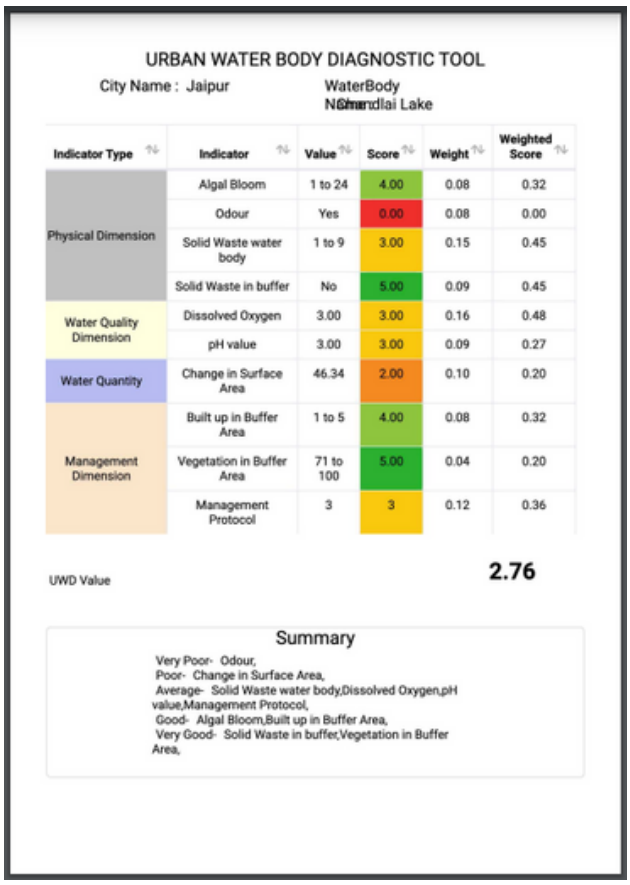
Summary

Very Poor- Odour,
Poor- Change in Surface Area,
Average- Solid Waste water body,Dissolved Oxygen,pH value,Management Protocol,
Good- Algal Bloom,Built up in Buffer Area,
Very Good- Solid Waste in buffer,Vegetation in Buffer Area,

Previous Save Report

Select *Save* to save the analysis for the waterbody in the profile.
Download report in pdf format if required by clicking on the *Report*

Report in pdf format whill be generated as shown in image below.



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	Odour	Yes	0.00	0.08	0.00
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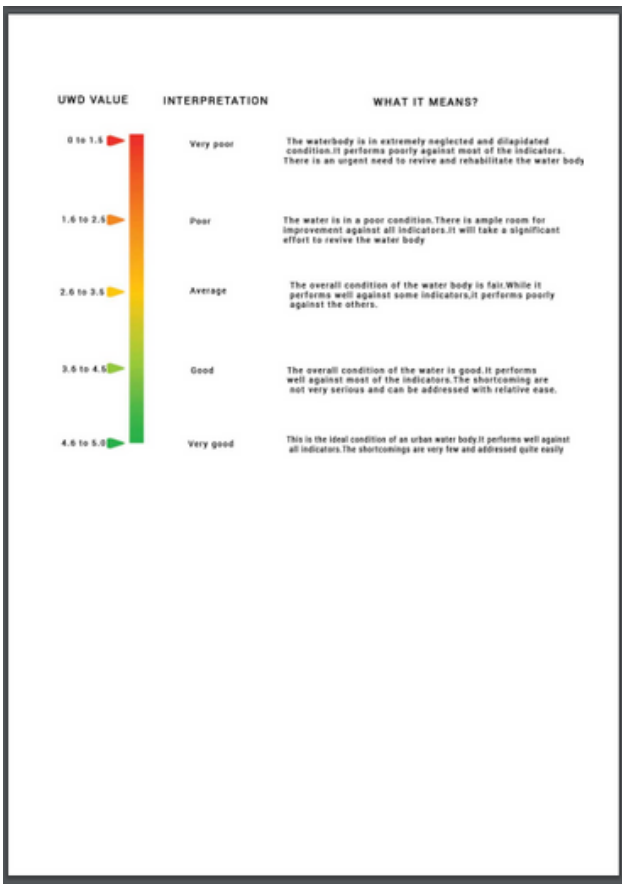
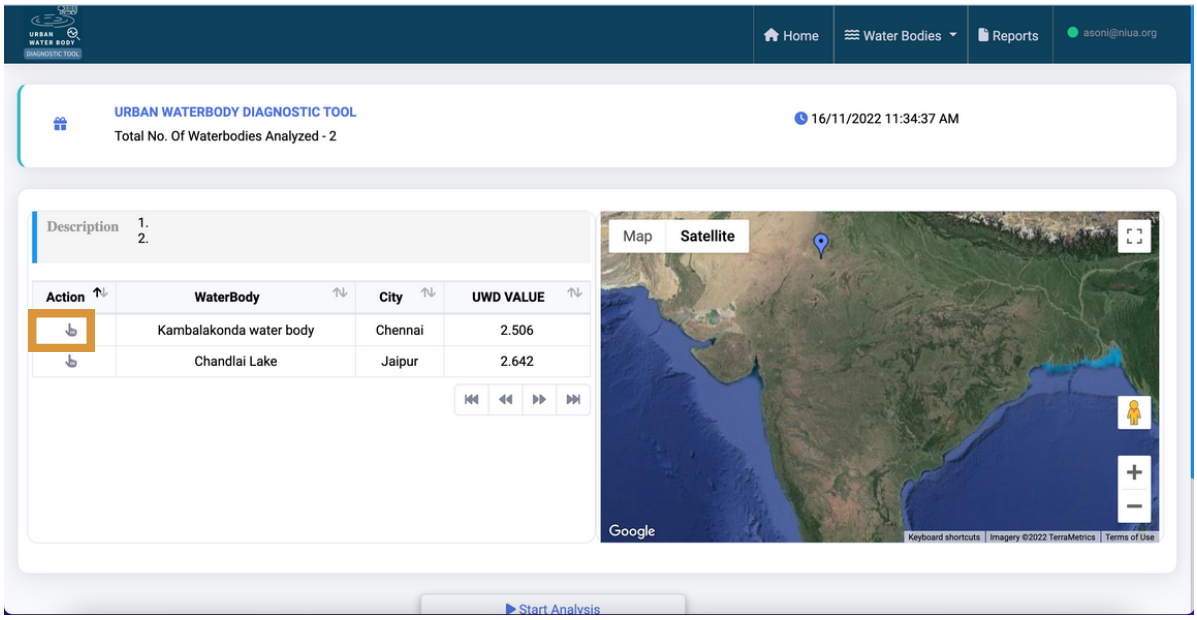
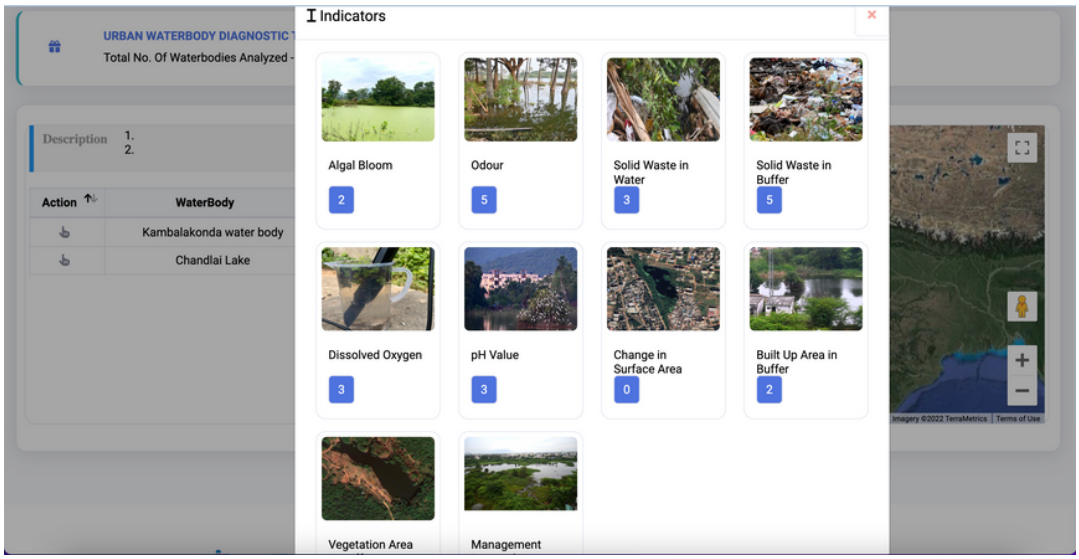


UWD VALUE	INTERPRETATION	WHAT IT MEANS?
0 to 1.5	Very poor	The waterbody is in extremely neglected and dilapidated condition.It performs poorly against most of the indicators. There is an urgent need to revive and rehabilitate the water body
1.6 to 2.5	Poor	The water is in a poor condition.There is ample room for improvement against all indicators.It will take a significant effort to revive the water body
2.6 to 3.5	Average	The overall condition of the water body is fair.While it performs well against some indicators,it performs poorly against the others.
3.6 to 4.5	Good	The overall condition of the water is good.It performs well against most of the indicators.The shortcoming are not very serious and can be addressed with relative ease.
4.6 to 5.0	Very good	This is the ideal condition of an urban water body.It performs well against all indicators.The shortcomings are very few and addressed quite easily

Analyzed waterbody : How to access database

Once the analysis is completed, the analysed waterbody is added to the user profile and can be accessed on the user's home page along with the location of the waterbodies.



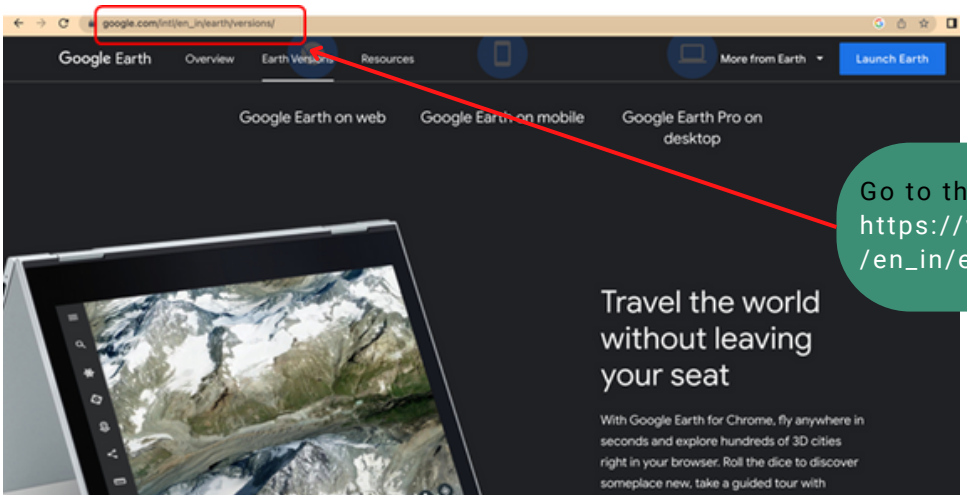


If you have any queries or suggestions for this tool, please E-mail us at :
waterbodytool@niua.org

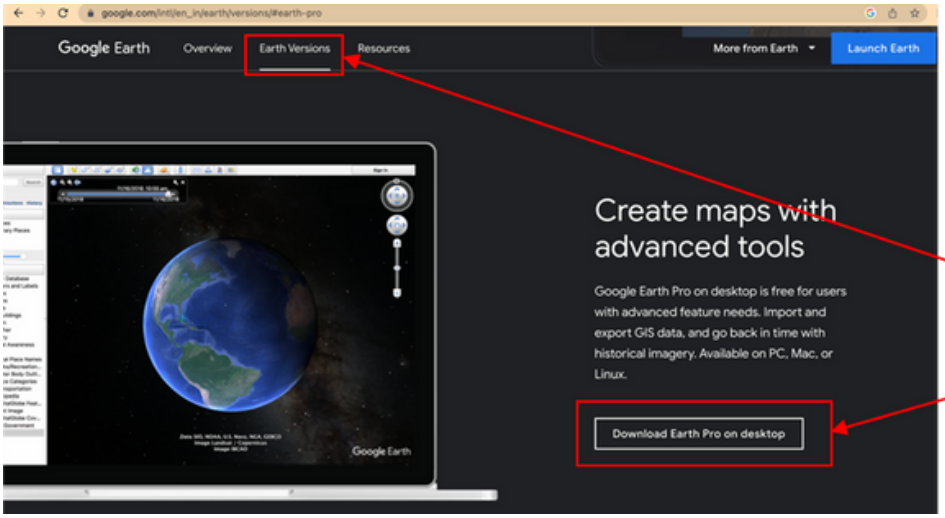
ANNEXURE 1

Generating KML files using satellite image

1 Install Google Earth Pro in your PC



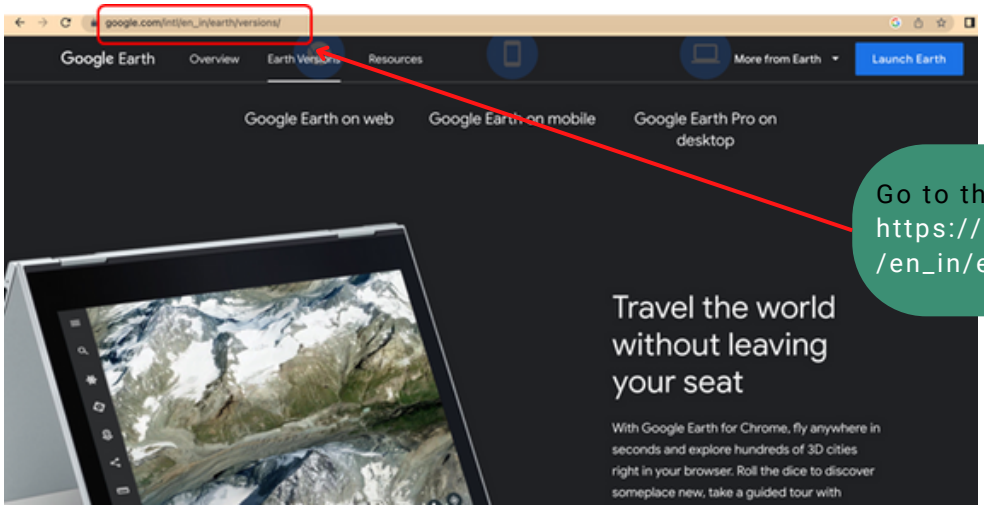
Go to the following url: https://www.google.com/intl/en_in/earth/versions/



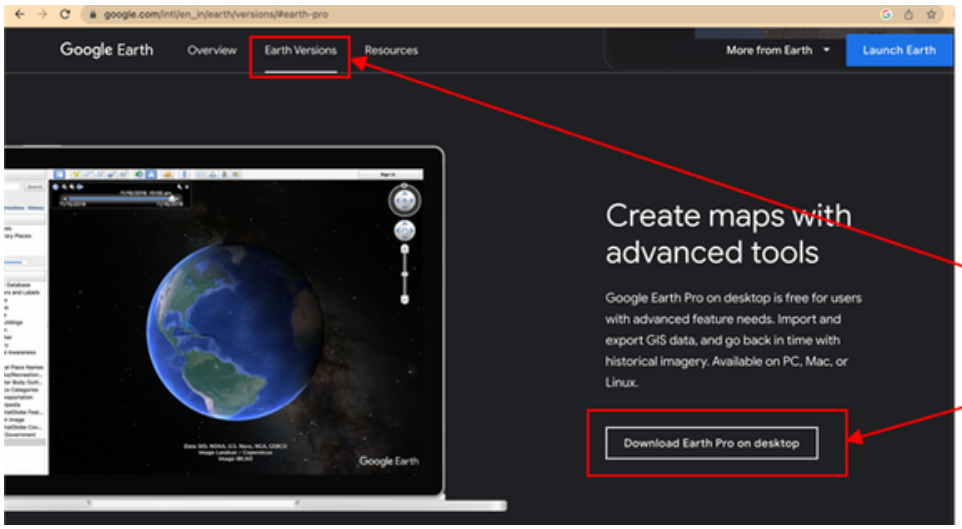
1. Select *Earth Versions*
2. Select *Download Earth Pro on desktop*

ANNEXURE

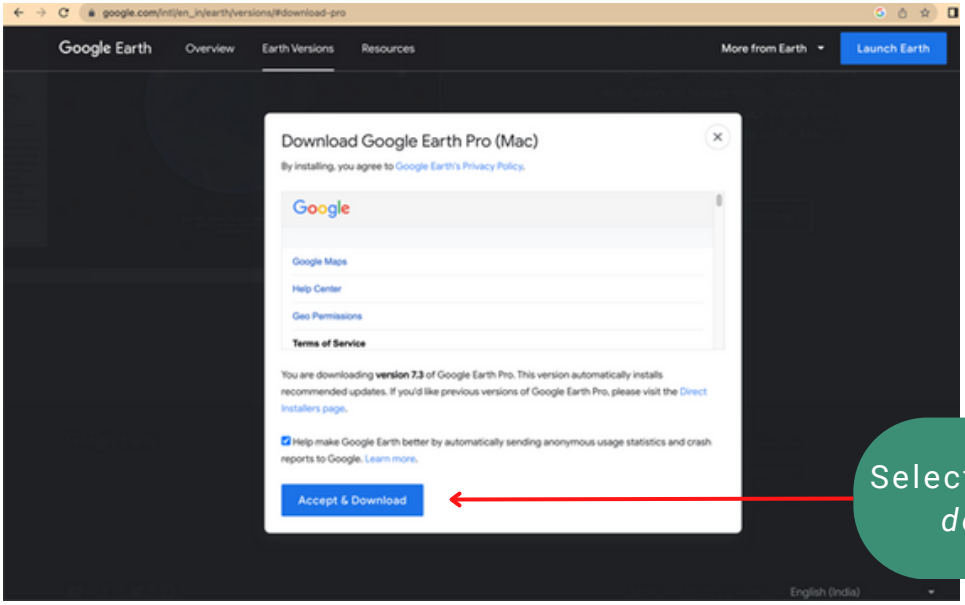
Generating KML files using satellite image: Step- 1 (Installing Google Earth Pro in your PC)



Go to the following url: https://www.google.com/intl/en_in/earth/versions/

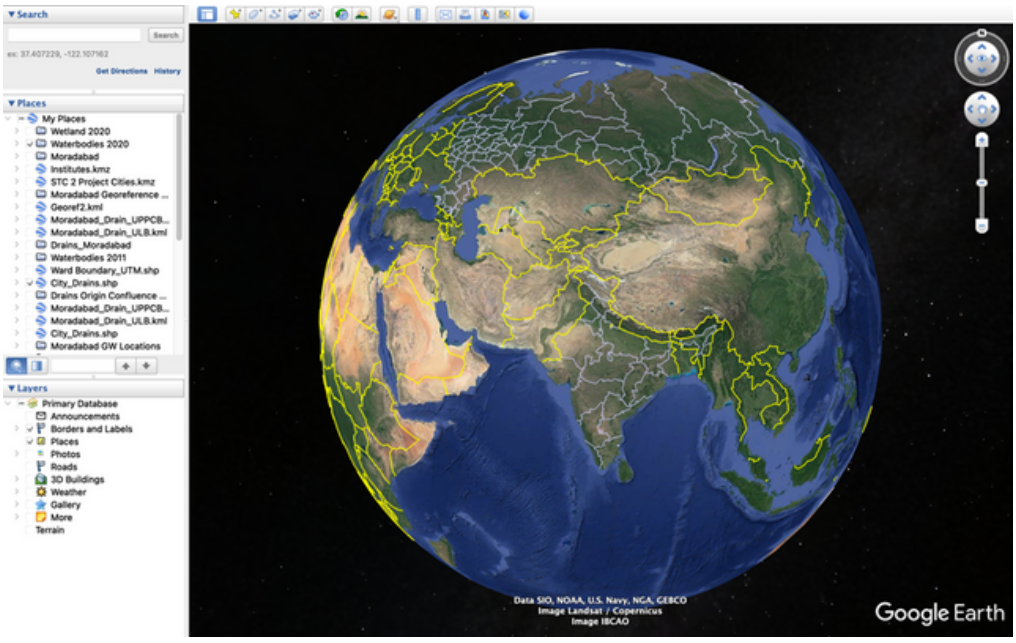


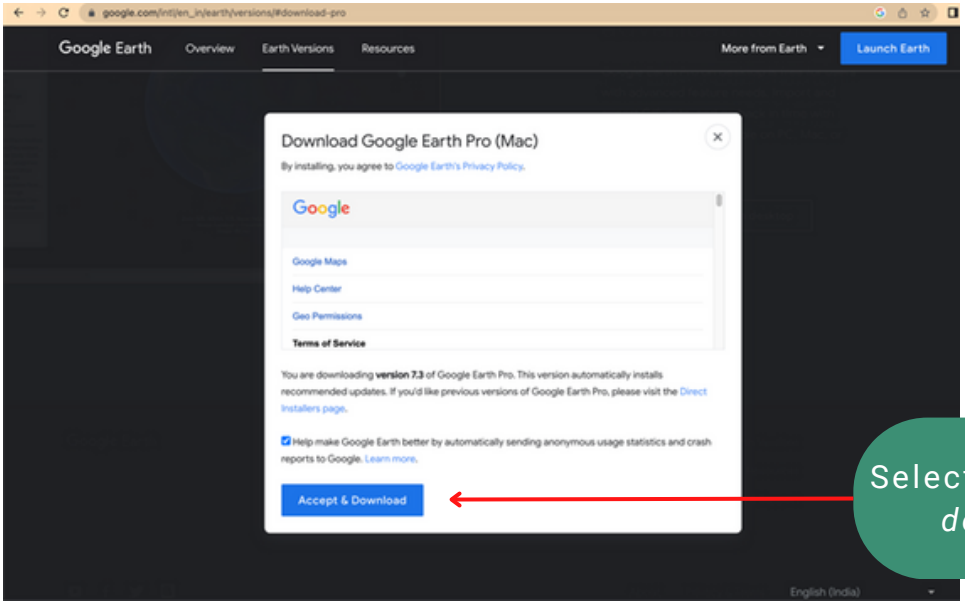
1. Select *Earth Versions*
2. Select *Download Earth Pro on desktop*



2 Open google earth pro

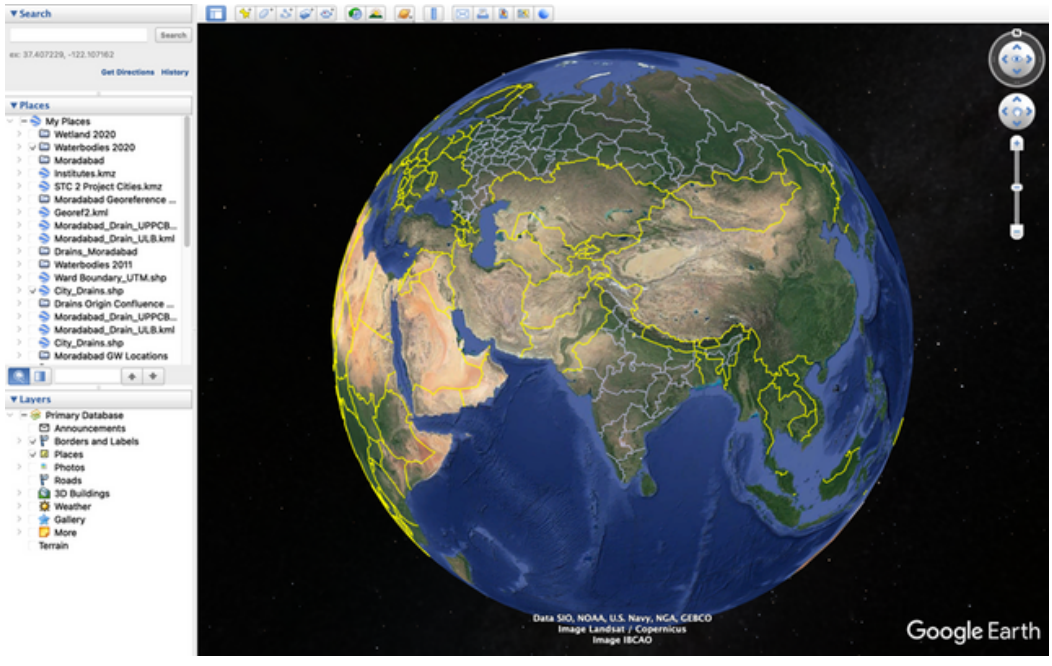
When you first start Google Earth, you will see the earth from space as shown in Figure below. To zoom in to an area of interest you can type a location into the text box on the "search" option and hit enter on your keyboard and Google Earth will zoom in on that part of the globe. For locating the particular waterbody, you can zoom in/out.



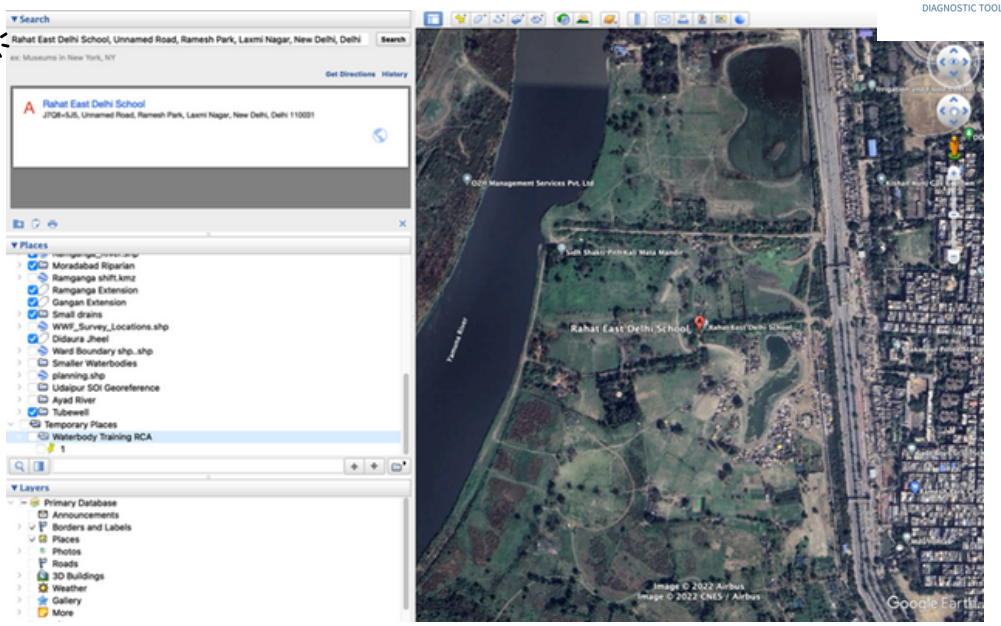


Generating KML files using satellite image: Step- 2

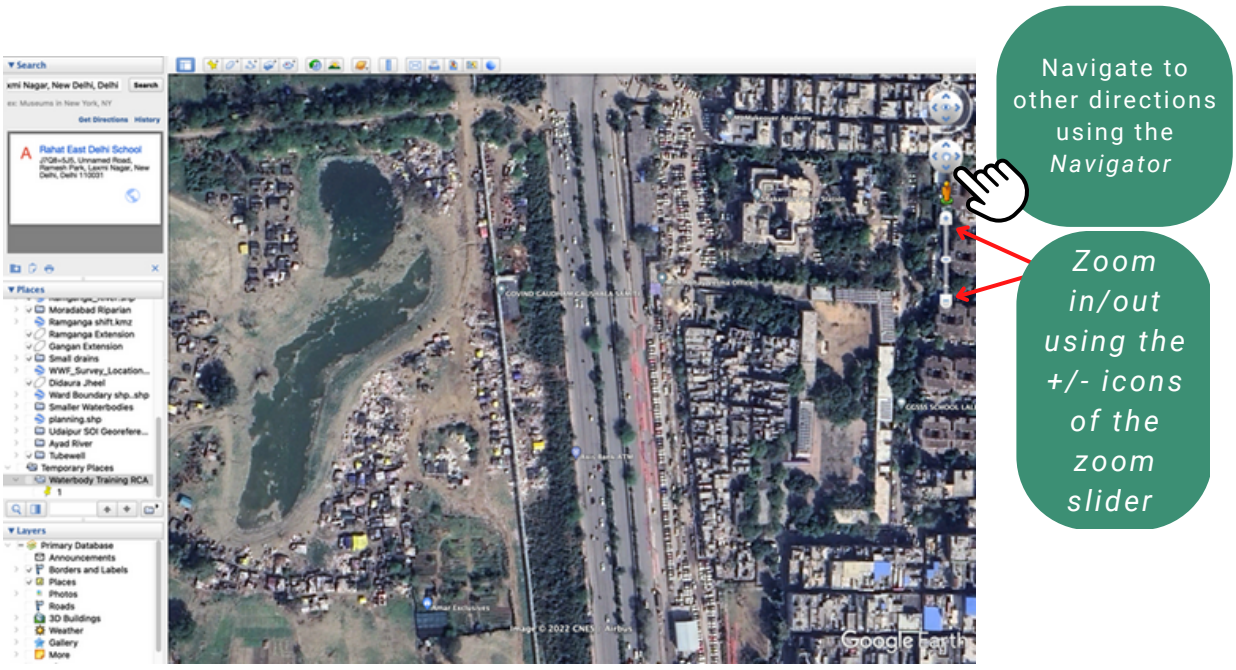
When you first start Google Earth, you will see the earth from space as shown in Figure below. To zoom in to an area of interest you can type a location into the text box on the "search" option and hit enter on your keyboard and Google Earth will zoom in on that part of the globe. For locating the particular waterbody, you can zoom in/out.



Search for the particular waterbody/ any nearby location and then locate the waterbody by zooming in/out.



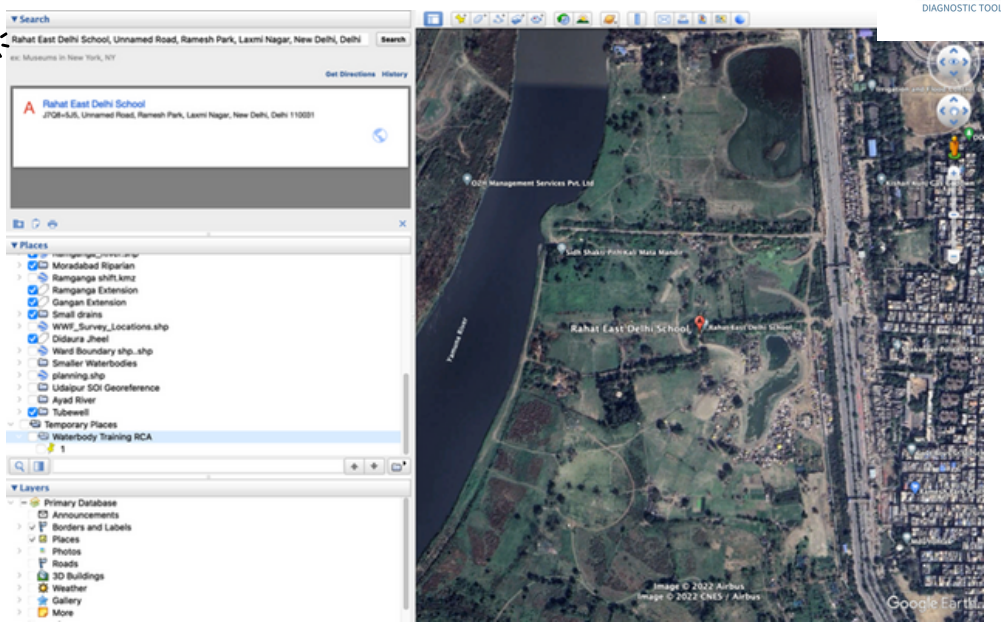
3 Zoom into the area for clearly locating the waterbody



Navigate to other directions using the *Navigator*

Zoom in/out using the +/- icons of the zoom slider

Search for the particular waterbody/ any nearby location and then locate the waterbody by zooming in/out.



Generating KML files using satellite image: Step- 3

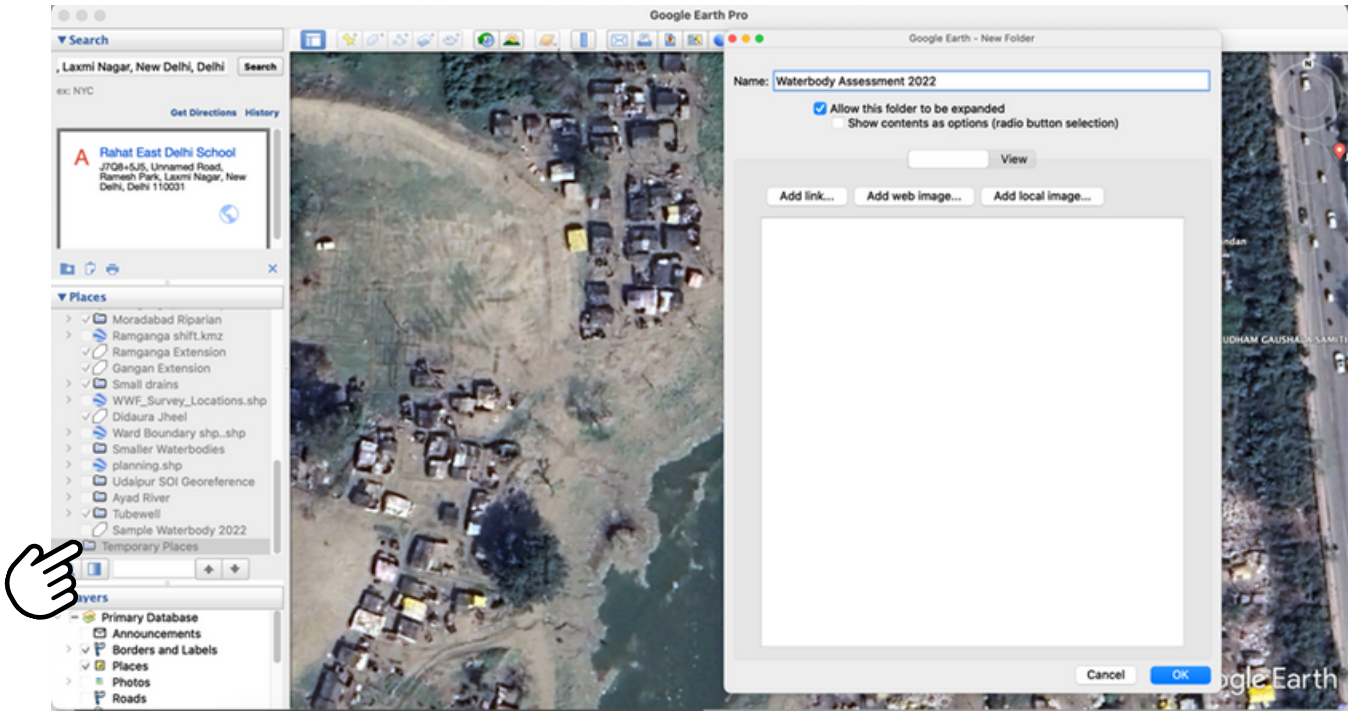
Zoom into the area for clearly locating the waterbody

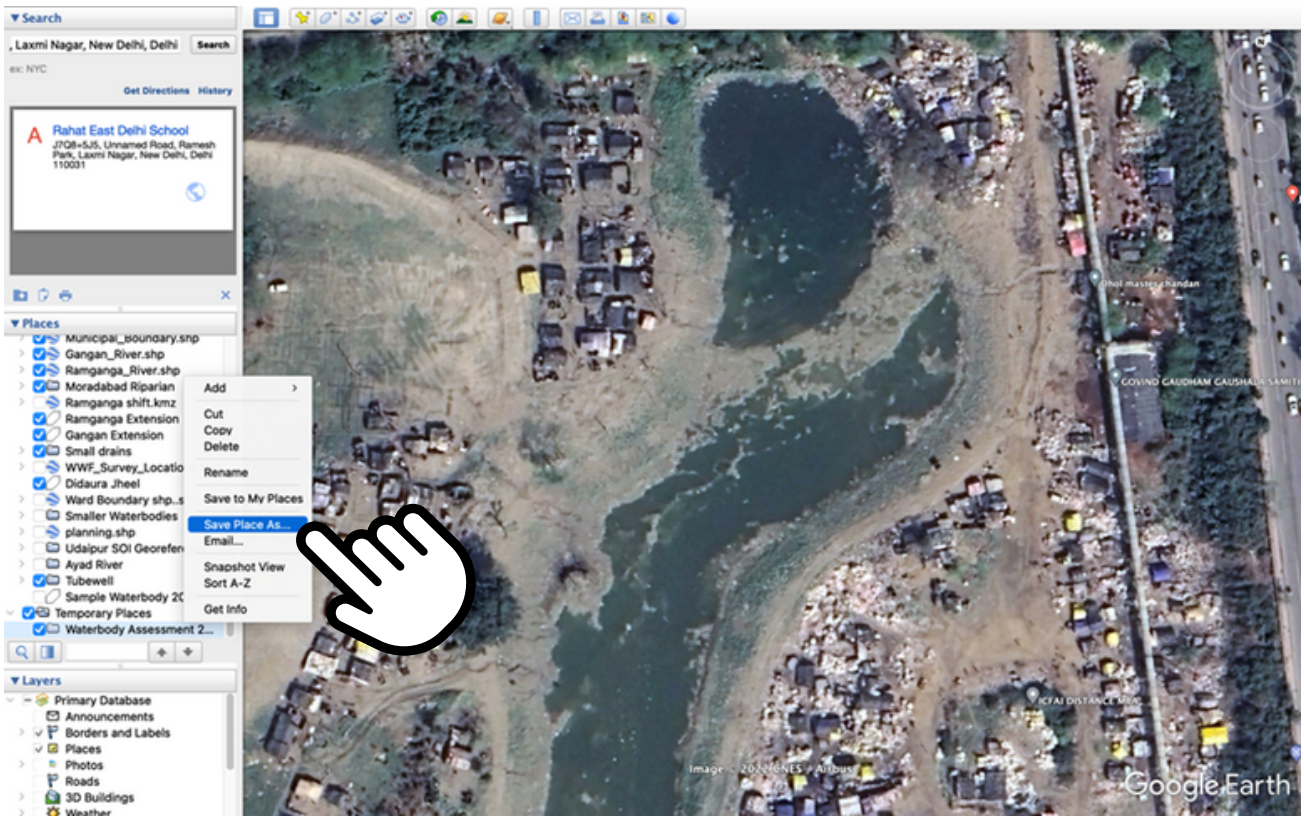
Navigate to other directions using the *Navigator*

Zoom in/out using the +/- icons of the zoom slider

4

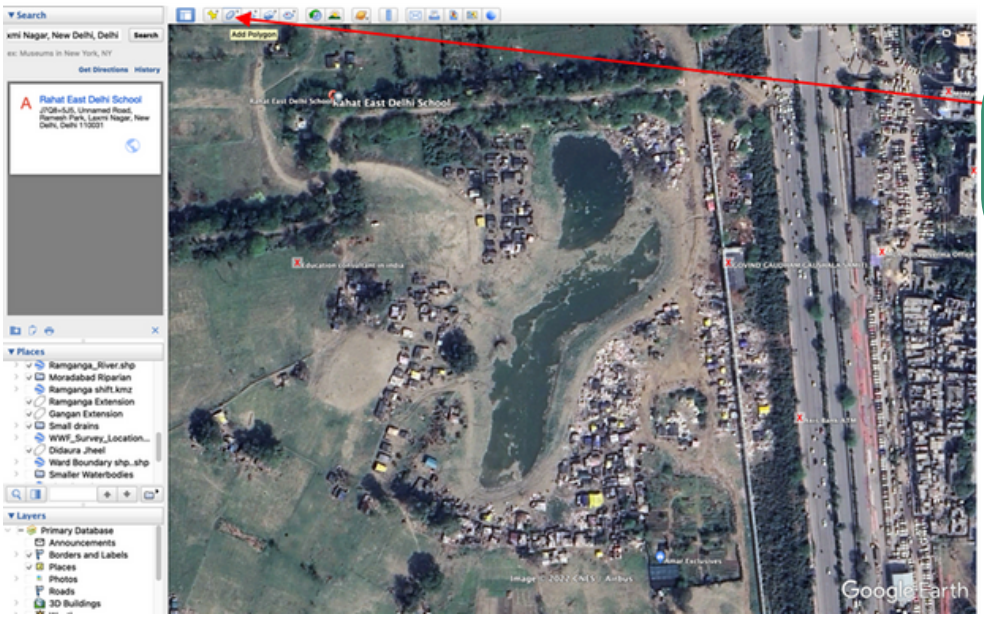
Create a separate folder under the Temporary Places. Name the folder suitably (e.g., Waterbody Assessment 2022) and then save it.





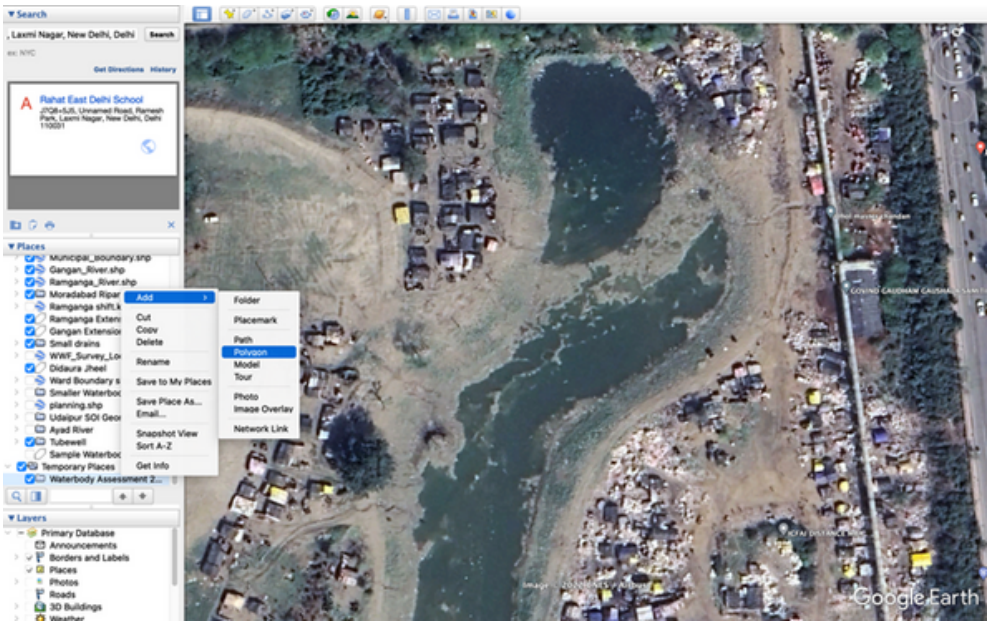
5

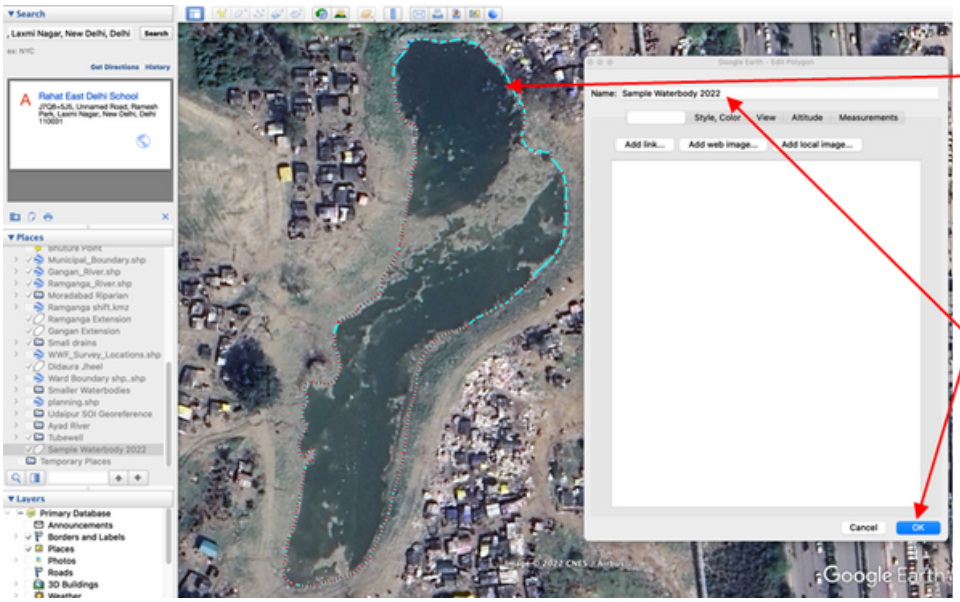
Create a polygon for the particular waterbody for the current year.



Select *Create Polygon* tool from the Layers Panel

Add polygon by doing a right click on the Waterbody Assessment 2022 folder and trace the particular waterbody.



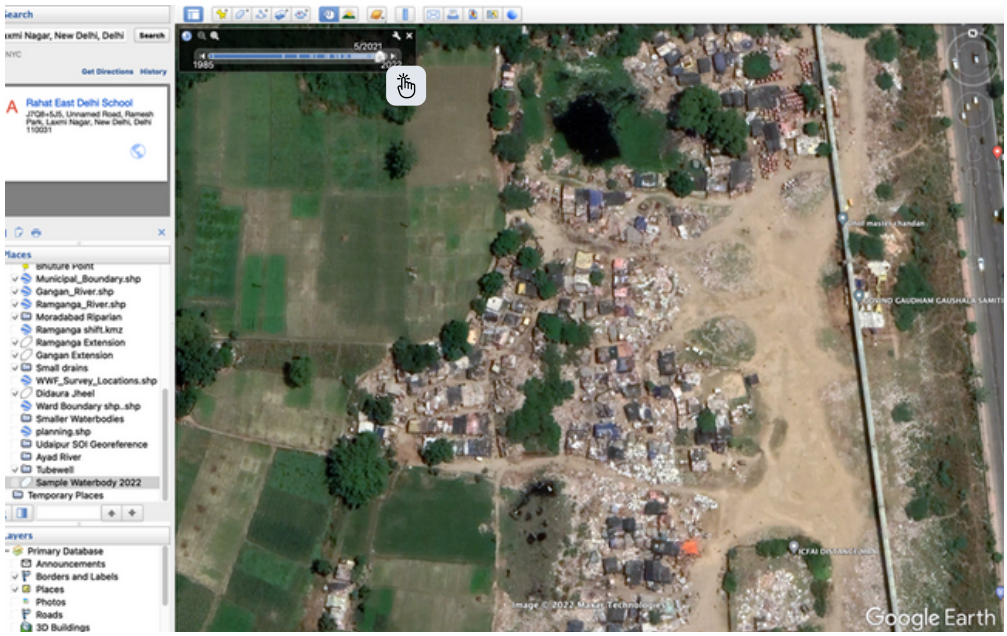


6

Observe the historical condition of the waterbody over previous five years

Observe the historical condition of the waterbody over previous five years (for the dry season preferably over the months of April-May, depending on the clarity of the image) and create polygons for each of the previous four years in a similar way as mentioned in the previous step. Save these kml layers in specific folders (e.g., Waterbody Assessment 2021; Waterbody Assessment 2020 etc.).

Go to the icon and use the glider to change dates of imagery accordingly



FOR ANY QUERIES PLEASE E-MAIL US AT:
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