10.0 Inventorying and mapping of Macroalgae

Macroscopic, multicellular marine algae or commonly referred as Seaweeds. They are of different types based on the presence of photosynthetic pigments and are categorized their colour as red, green and brown algae. Like the land plants, seaweeds contain photosynthetic pigments and with the help of sunlight and nutrient present in the seawater, they photosynthesize and produce food. Seaweeds are found in the coastal region between high tide to low tide and in the sub-tidal region up to a depth where photosynthetic light is available. Seaweeds are similar in form with the higher vascular plants but the structure and function of the parts significantly differ from the higher plants. Seaweeds do not have true roots, stem or leaves and whole body of the plant is called thallus that consists of the holdfast, stipe and blade.

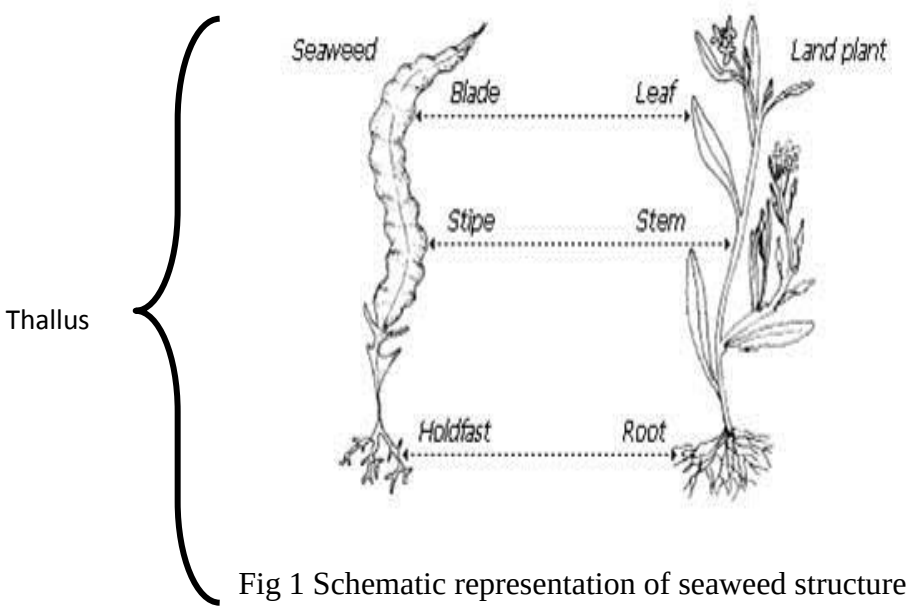


Fig 1 Schematic representation of seaweed structure

- **Blades:** Leaf like structure which occurs in different shapes such as flattened, tubular, round, smooth, perforated, segmented, dented, etc.
- **Stipe:** Stipe is the elongated stalk of seaweed which supports the blade and keep them erect
- **Holdfast or Haptera:** These are structures used to attach seaweeds to hard substratum. They can be discoidal, rhizoidal, bulbous or branched depending on the substratum it attaches.
- **Float:** These are structures observed in brown algae, a balloon like structure that keeps the algae afloat in the water.

Materials required for seaweed collection:

- Tide chart (http://www.tides4fishing.com/as/india/mangalore)
- Polyethylene bags
- Knife or scalpel
- Labeling materials (pen/pencil, labels, marker pens etc.)
- Rubber bands
- Field note book

Procedure:

- Reading the tide chart and marking the low tide timings and date, preferably below 1m tide should be chosen
- Samples can be selected at random as per requirement by selecting sampling points in the area
- Using the identification key below, identify the seaweed species.
- If the identification cannot be carried out in the field, sample can be carried in a zip lock cover to the lab and identified at lab using the identification keys.
- Wet preservation of seaweed samples can be done using 5-10% formaldehyde in seawater.
- Photograph of seaweeds in natural habitat can be documented as well.
- Once the seaweeds are cleaned of all the epiphytes, dry the seaweed using a tissue and in a tray spread out the seaweed (along with a scale) and photograph.

Data compilation - Macroalgae

Name of the collector :				***Date:*** ***Time:*** ***Low tide (m):***		
Sl.no.	**Latitude**	**Longitude**	**Seaweed species**	**Division** (Red, Green, Brown)	**Habitat** (Intertidal, Supratidal, Subtidal)	**Growth Type** (Sparse, Patchy Tuft, Foliose, abundant)

Fig 2. Different structures represented in all Red ,Green and Brown seaweed

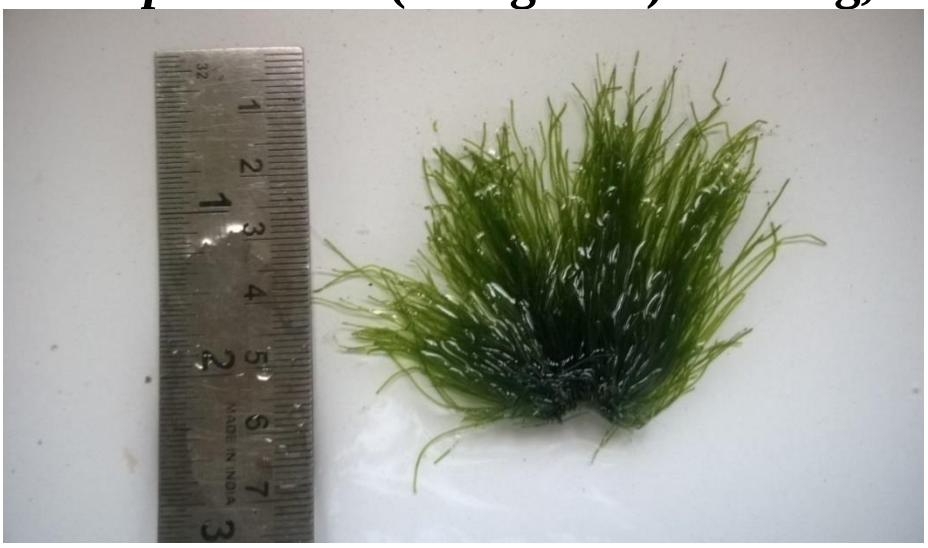
Ulva lactuca Linnaeus,1753

Kingdom	Plantae
Phylum	Chlorophyta
Class	Ulvophyceae
Order	Ulvales
Family	Ulvaceae
Description:	Plant grows up to 20 cm tall, light green to dark green in colour, blades are folded and are like waxed paper to touch, reproduces both asexually and sexually. Edible seaweed in most of the South east Asian countries.
Vernacular name:	Sea lettuce (England), Zeesla (Dutch), Ulve (French)
Worldwide distribution	Australia , North pacific ocean , Belgium , Federal Republic of Somalia , France , Gulf of Mexico , Indian Ocean , Ireland , Kenya , Madagascar , Mediterranean sea, North Atlantic ocean , Seychelles , South Africa
Distribution along Indian coast:	Gujarat, Maharashtra, Goa, Karnataka, Kerala, Lakshadweep.
Distribution in Uttara Kannada:	Majali- Karwar; Belekan, Kirubele, Om beach- Kumta; Dhareshwar, Mugli- Honnavar
Habitat:	*Ulva* is tolerant to environmental parameters such as desiccation, full sunlight and variations in salinity and temperature. This enables it to occupy a broad range of habitats from the upper intertidal (mainly rock pools) to the subtidal. Occurs throughout the year
Growth season	Occurs throughout all the season
Economic uses	Food, animal feed, medicine, Potential biomass feedstock for bioethanol production

Ulva fasciata Delile,1813

Kingdom	Plantae
Phylum	Chlorophyta
Class	Ulvophyceae
Order	Ulvales
Family	Ulvaceae
Description:	Thalli thin, sheet like consisting of wide blades, grows upto 1 m long. Holdfast is small without dark rhizoids. Bright grass green to dark green, gold at margins when reproductive. White in colour when stressed.
Vernacular name:	*Limu palhalala (*Hawai'i)
Worldwide distribution:	Eastern Atlantic, Caribbean, Indian and Pacific Ocean. Aegean Sea , Australia , North pacific ocean , Belgium , Federal Republic of Somalia , France , Gulf of Mexico , Indian Ocean , Ireland , Kenya , Madagascar , Mediterranean sea , North Atlantic ocean , North Sea , Republic of Mauritius , Seychelles , South Africa
Distribution along Indian coast:	Gujarat, Maharashtra, Goa, Kerala, Lakshadweep
Distribution along Uttara Kannada coast:	Majali- Karwar; Belekan, Kirubele, Om beach-Kumta; Dhareshwar, Mugli-Honnavar
Habitat:	Found on intertidal rocks, in tide pools and on reef flats. Abundant in areas of fresh water runoff high nutrients such as near the mouth of stream and run off pipes
Growth season	Occurs throughout all the seasons
Economic use:	Used as food in Hawai'i along with salads
Ecology:	Potentially invasive, increased bloom observed in nutrient rich waters

Chaetomorpha media (C. Agardh) Kutzing, 1849



Kingdom	Plantae
Phylum	Chlorophyta
Class	Ulvophyceae
Order	Cladophorales
Family	Cladophoraceae
Description:	Plant grows upto 8-10 cm tall, blades are long and thin attached by a small disc represents hair like structures, green in colour,
Worldwide distribution:	Gulf of Mexico, Caribbean Sea, Puerto rico, Australia
Distribution along Indian coast:	Gujarat, Malvan, Ratnagiri (Maharashtra), Goa, Karnataka.
Distribution along Uttara Kannada Coast:	Kumta beach, Majali- Karwar; Belekan, Kirubele, Om beach-Kumta; Dhareshwar, Mugli-Honnavar, Murudeshwar, Apsarkonda
Habitat:	Mostly confined to supra littoral and intertidal zone, sensitive to temperature easily dried, occurs during monsoon and starting of post monsoon.
Growth season	Occurs through all the seasons, dries up during prolonged emersion periods.
Economic Uses :	Food, cattle feed and agriculture.

Caulerpa taxifolia (M. Vahl) C. Agardh, 1817

Kingdom	Plantae
Phylum	Chlorophyta
Class	Ulvophyceae
Order	Bryopsidales
Family	Caulerpaceae

Description: Plant with erect branches often close together, blades simple or sparingly branched, rhizoid bearing branches, Dark green to light green

Worldwide distribution: Adriatic Sea , Australia, California, Mediterranean, Eastern Atlantic (Africa canaries), Western Atlantic, Indo-Pacific, North pacific ocean , Caribbean, Gulf of Mexico, Federal Republic of Somalia , Gulf of Mexico , Indian Ocean , Kenya , Madagascar , North Atlantic ocean , Republic of Mauritius , Seychelles , Tanzania , Venezuela.

Distribution along Indian coast: Malvan (Maharashtra), Karnataka.

Distribution along Uttara Kannada coast: Majali- Karwar, Honnavar – Bhatkal

Habitat: Grow in tidal pools, covers available substrate, including rock, sand and mud.

Growth season occurs after Monsoon seasons

Economic use: Used as food source and animal feed.

Ecology: Called "killer algae" in Mediterranean Sea. *C. taxifolia* has a number of characteristics that make it a successful invader. An extensive rhizoid system aids in nutrient acquisition from sediments in nutrient-poor waters

Enteromorpha intestinalis (Linnaeus) Nees, 1820

Kingdom	Plantae
Phylum	Chlorophyta
Class	Ulvophyceae
Order	Ulvales
Family	Ulvaceae

Description:	Plant grows up to 30 to 50 cm long, blades elongated and inflated tube like, green in colour.
Vernacular name:	Gut weed, grass kelp (English), Enteromorphe (French), Darmatang (German)
Worldwide distribution:	Baltic sea, Belgium, France, Gulf of Finland, Mediterranean sea, Netherlands, North Atlantic Ocean, North sea, Seychelles, South Africa, Wadden sea.
Distribution along Indian coast:	Goa; Malvan, Ratnagiri, (Maharashtra), Lakshadweep, Karnataka
Distribution along Uttara Kannada Coast:	Kirubile-Kumta, Dhareshwar-Honnavar, Gokarna-kumta, Honey beach-Ankola.
Habitat:	open coast and in estuaries, attached to any substrata; littoral and shallow sublittoral
Growth season	Occurs throughout all the seasons.
Economic Uses	Edible-raw, toasted and steamed Food, animal feed and medicine

Grateloupia lithophila Borgesen, 1938

Kingdom	Plantae
Phylum	Rhodophyta
Class	Florideophyceae
Order	Halymeniales
Family	Halymeniaceae

Description:	Blades are long and irregular tapering at the end, grows 10-15 cm long, slimy to touch, forms tuft on hard substratum.
Worldwide distribution:	Yemen, Sri Lanka, Indonesia
Distribution along Indian coats:	Goa, Maharashtra, Karnataka.
Distribution along Uttara Kannada coast:	Mugli-Honnavar; Kirubele, Belekan- Kumta; Honey beach-Ankola
Habitat:	Found in intertidal area, and tidal pools
Growth seasons	Occurs in mid Monsoon, easily dried up during prolonged emersion periods.
Economical Uses:	Potential feedstock for Bioethanol production

Gelidiopsis varaiabilis (Greville ex J. Agardh) F. Schmitz ,1895

Kingdom	Plantae
Phylum	Rhodophyta
class	Florideophyceae
Order	Rhodymeniales
Family	Lomentariaceae

Description:	Thalli erect, about 4 cm high, composed of a few, irregularly branched cylindrical branches.
Worldwide distribution:	Diego Garcia atoll, Indonesia, Madagascar ,Seycelles, South Africa Sri Lanka
Distribution along Indian coats:	Lakshadweep, Kerala , Tamil Nadu (Tuticorin , Kaniyakumari , Mandapam) , Maharashtra (Bombay) , Andra Pradesh , Jalleshwar , Okha (Gujarat) Madagascar ,
Distribution along Uttara Kannada coast:	Majali (Karwar), Mugli (Honnavar),Vannali (Kumta)
Growth seasons	Post monsoon
Habitat:	Found in intertidal zone in Rocky shores
Economical Uses:	Agar production

Gelidium pusillum (Stackhouse) Le Jolis, 1863

Kingdom	Plantae
Phylum	Rhodopyta
Class	Florideophyceae
Order	Gelidiales
Family	Gelidium
Description:	Small plant grows upto 2-5 cm, forms tuft on substrata, blade is slightly long and flattened at the tip, sparsely pinnately proliferating. Blackish-red colour when dry, extensive rhizoids and flattened reproductive fronds
Vernacular name:	Small agar algae (Norwegian Bokmal)
Worldwide distribution:	France, Gulf of Mexico, Indian Ocean, Ireland, Kenya, Mediterranean Sea, North Atlantic Ocean, North Sea, Republic of Mauritius, Tanzania
Distribution along Indian coast:	Dwarka, Porbandar, Veraval (Gujarat), Mumbai (Maharashtra), Lakshadweep , Karnataka
Distribution along Uttara Kannada coast:	Majali- Karwar**;** Mugli – Honnavar
Habitat:	Found on exposed hard substratum in intertidal area.
Growth season	Occurs throughout all the seasons, peak growth in Pre monsoon
Economic uses:	Potential feedstock for bioethanol production also potential species as source of agar

Hypnea valentiae (Turner) Montagne, 1841

Kingdom	Plantae
Phylum	Rhdophyta
Class	Florideophyceae
Order	Gigartinales
Family	Cystocloniaceae

Description: Plant is erect and firmly branched. Branches are simple and thread like but occasionally forked and are distinctly oriented at right angle to the axis; inflated branches are seen as swollen bands at the middle, near the base or rarely near the tips of the ultimate branchlets

Worldwide distribution: Aegean Sea, Gulf of Mexico, Indian Ocean, Kenya, Madagascar, Mediterranean Sea, North Atlantic Ocean, Republic of Mauritius, Seychelles, Tanzania

Distribution along Indian coast: Bombay, Malvan, Ratnagiri, (Maharashtra) Goa, Karnataka, Lakshadweep.

Distribution along Uttara Kannada coast: Majali- Karwar; Om beach – Kumta.

Habitat: Mangrove swamps and Intertidal zone

Growth season Monsoon and Post monsoon

Economic Uses: It is a carrageenan yielding plant. This seaweed is also edible and the freshly gathered seaweed is commonly prepared as salad. Potential feedstock for biofuel production

Chondria armata (Kutzing) Okamura, 1907

Kingdom	Archaeplastida
Phylum	Rhodophyta
Class	Florideophyceae
Order	Ceramiales
Family	Rhodomelaceae

Description:	Thallus simple or branched, attached to rocky substratum by conical hold fast and clumps of rhizoids, branches with pinnately sub divided fronds which are arranged alternately in two opposite vertical rows. Tip of the branches bears hair-like structure when young, prominent but rarely persistent when old
Worldwide distribution:	Indian ocean, Kenya, Mozambique, South Africa, Tanzania
Distribution along Indian Coast:	Maharashtra (Bombay), Tamil Nadu (Tuticorin, Krusadai Island), Gujarat (Okha, Dwarka, Gulf of Kutch, Saurashtra), Goa, Lakshadweep Island, Andra Pradesh, Karnataka, Kerala.
Distribution along Uttara Kannada Coast:	Om beach-Kumta; Mugli- Honnavar
Habitat:	Intertidal zone in the lower parts of rocky shore
Growth season:	Throughout all the seasons
Economical uses:	Pharmaceuticals for glycoglycerolipid extraction

Gracilaria corticata (J. Agardh) J. Agardh, 1852

Kingdom	Archaeplastida
Phylum	Rhodopyta
Class	Florideophyceae
Order	Gracilariales
Family	Gracilariaceae

Description: Plants 10-12cm long, the thallus consists of bundles of flat and much divided blades with 2-3 mm broad segments; branching is dichotomous in young blades; in older plants numerous marginal projections line the edges of the segments in a pinnate fashion; they are ½-2 cm long; the colour of the plants vary from deep purple to grass green.

Worldwide distribution: Indian ocean, Kenya, Madagascar, Republic of Mauritius, Tanzania.

Distribution along Indian Coast: Dwarka, Okha (Gujarat), Bombay, Malvan, Ratnagiri, (Maharashtra) Goa, Karnataka**.**

Distribution along Uttara Kannada Coast: Majali- Karwar; Dhareshwar, Mugli-Honnavar, Murudeshwar, Apsarkonda – Honnavar

Habitat: Intertidal and subtidal zone

Growth season Observed during all the seasons with peak growth in Post monsoon and Pre Monsoon.

Economical Uses : It can be used for agar production, food, animal feed

Padina tetrastromatica Hauck, 1887

Kingdom	Chromista
Phylum	Ochrophyta
Class	Phaeophyceae
Order	Dictyotales
Family	Dictyotaceae

Description:	Thalli divided into several small lobes, regularly and distinctly concentrically zonate; easily recognized due to dark double lines of sporangia; enclosing a line of colourless hairs in between; blades composed of two layers of cells.
Worldwide distribution:	Mediterranean Sea (Eastern basin), Federal Republic of Somalia, Kenya, Seychelles, South Africa, Tanzania.
Distribution along Indian Coast:	Gujrat, Malvan, Ratnagiri, (Maharashtra), Goa, Karnataka, Lakshadweep,
Distribution along Uttara Kannada Coast:	Karwar , Honnavar , Bhatkal
Habitat:	Mangrove swamps (attached to mud)/Intertidal and on sandy shores
Growth seasons	Growth period Mid Monsoon, peak growth in Post Monsoon
Economical Uses:	Extraction of alginate, fertilizer

Sargassum ilicifolium (Turner) C.Agardh, 1820

Kingdom	Chromista
Phylum	Ochrophyta
Class	Phaeophyceae
Order	Fucales
Family	Sargassaceae

Description: Plants 30-40 cm high with elliptical leaves in the upper part of the plant, 1-3 cm long and 8-15 mm broad; the margin is toothed, with minute and larger teeth mixed; midrib is visible for 2/3 of the length of the leaf, vanishing near the tip; branches are provided with spiny outgrowths; vesicles are nearly globular, 3-5mm in diameter with a stalk of the same length.

Worldwide distribution: Kenya, Madagascar, Republic of Mauritius, Seychelles, South Africa, Tanzania.

Distribution along Indian Coast: Gujarat, Malvan, (Maharashtra), Goa, Karnataka, Lakshadweep,

Distribution along Uttara Kannada Coast: Majali- Karwar; Honnavar , Bhatkal .

Habitat: Mangrove swamp, Intertidal in open coast.

Growth season: Growth period Mid Monsoon, peak growth in Post Monsoon

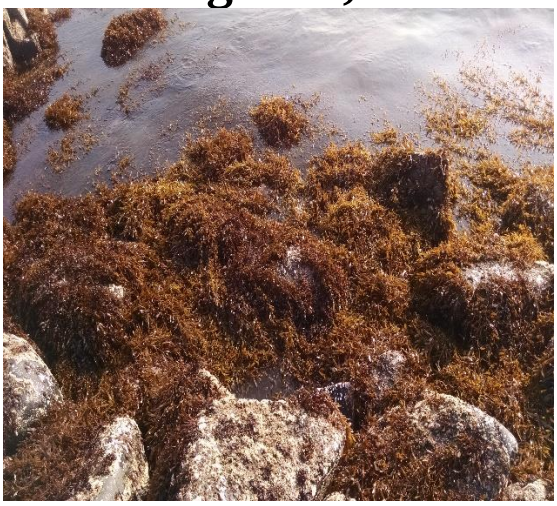
Economic uses: Used as a source of alginate, fertilizer, medicine and animal feed

Sargassum cinereum J.Agardh, 1848

Kingdom	Chromista
Phylum	Ochrophyta
Class	Phaeophyceae
Order	Fucales
Family	Sargassaceae

Description:	Plants with short, stout main axis, bearing terate, smooth, primary branches at their upper part, beset with secondary branches and branchlets; basal leaves membranaceous, oblong, about 2.5 - 3 cm long, 7 - 8 mm broad, rounded at the apices and dentate at the margins; leaves of the branchlets lanceolate, 2 - 2.5 cm long, 3 - mm broad, cuneate at the base. Vesicles spherical, about 4 mm diameter, obovate, rounded, usually mucronate at the apices, sub cylindrical below.
Worldwide distribution:	Laccadive island, Sri Lanka, Indonesia, Mauritius
Distribution along Indian Coast:	Malvan, Ratnagiri, (Maharashtra). Goa, Karnataka, Kerala.
Distribution along Uttara Kannada Coast:	Vannalli rocky shore-Kumta , Honnavar , Bhatkal , Majali rocky shore-Karwar
Habitat:	Intertidal zone
Growth season:	Growth period Mid Monsoon, peak growth in Post Monsoon
Economical Uses :	Used as a source of alginate, fertilizer, medicine

Sargassum wightii Greville ex J. Agardh, 1848



Kingdom	Chromista
Phylum	Ochrophyta
Class	Phaesophyceae
Order	Fucales
Family	Sargassaceae
Description:	Plant dark-brown, 20-30 cm in height with a well-marked holdfast, upper portion richly branched, axes cylindrical, glabrous, leaves 5-8 cm long and 2-9mm broad, leaves tapering at the base and apex, midrib inconspicuous vesicles large, spherical or ellipsoidal being 5-8mm long and 3-4 mm broad, stipe of the vesicle 5-7 mm long seldom ending into a long tip, receptacles in clusters and repeatedly branched.
Worldwide distribution:	Indian Ocean.
Distribution along Indian Coast:	Bombay(Maharashtra) , Goa, Karnataka , Kerala.
Distribution along Uttara Kannada Coast:	Majali- Karwar
Habitat:	Intertidal and subtidal
Growth season:	Growth period Mid Monsoon, peak growth in Post Monsoon
Economical Uses:	It is used as raw material for the production of sodium alginate. It also contains 8-10 % of mannitol which can be used as substitute for sugar, fertilizer and medicine

Dictyota bartayresiana J.V. Lamouroux, 1809

Kingdom	Chromista
Phylum	Ochrophyta
Class	Phaeophyceae
Order	Dictyotales
Family	Dictyotacea

Description:	Plants 9-14 cm high, erect, not entangled, a little harsh to the touch, attached to the substratum by irregularly shaped holdfast with rhizoids, thallus branched dichotomously; segments without midrib, 1 to 1.5 cm long, 2 - 4 mm broad above a fork, broadening to 6 - 10 mm below the next fork; margin entire, tips are pointed except in young branches. Sporangia 125 - 140 µ in diameter.
Worldwide distribution:	Gulf of Mexico , Indian ocean , Kenya ,Madagascar, Mozambique , New Zealand , North Atlantic ocean , Republic of Mauritius , Seychelles , Tanzania .
Distribution along Indian Coast:	Okha (Gujrat), Malvan, Ratnagiri, (Maharashtra), Goa, Karnataka, Lakshadweep
Distribution along Uttara Kannada Coast:	Karwar , Honnavar , Bhatkal
Habitat:	Intertidal zone
Growth season:	Growth period Mid Monsoon, peak growth in Post Monsoon
Economical Uses:	Food, animal feed and alginate production

3. Seaweed genera identification Key

Key to common Genera of Chlorophyta

1. Plant hollow and tubular, one celled thick.....Enteromorpha.
Plant membranous .....2.
2. Plant membranous, 2 celled thick .....Ulva.
Plant filamentous, unbranched thick cell wall .....3.
3. Plant filamentous, thick cell wall, basal cell long
compared with the width, unbranched.....Chaetomorpha.
Plant filamentous branched .....4.
4. Plant filamentous tufted branched,
lower branches dichotomous .....Cladophora
Plant coenocytious. .....5.
5. Plant coenocytious organized to form
stolon and erect branches .....Caulerpa

Key to common Genera of Phaeophyta

6. Plant erect, dichotomously branched with rounded
apex, unilocular sporangia .....Dictyota
Plant broad, sparsely branched without mid-rib.....7.
7. Plant broad, erect, margin entire, branches
irregularly dichotomus .....Spatoglossum
Plant entire, lobbed .....8.
8.Plant entire, lobbed,2-8 celled thick marked with
concentric row of hairs ..... Padina
Plant erect, axis cylindrical bearing leaves and vesicles 9
9. Plant with erect axis, branched, leaves membranous,
prominent mid rib, receptacles axially ..... Sargassum.

Key to common Genera of Rhodophyta

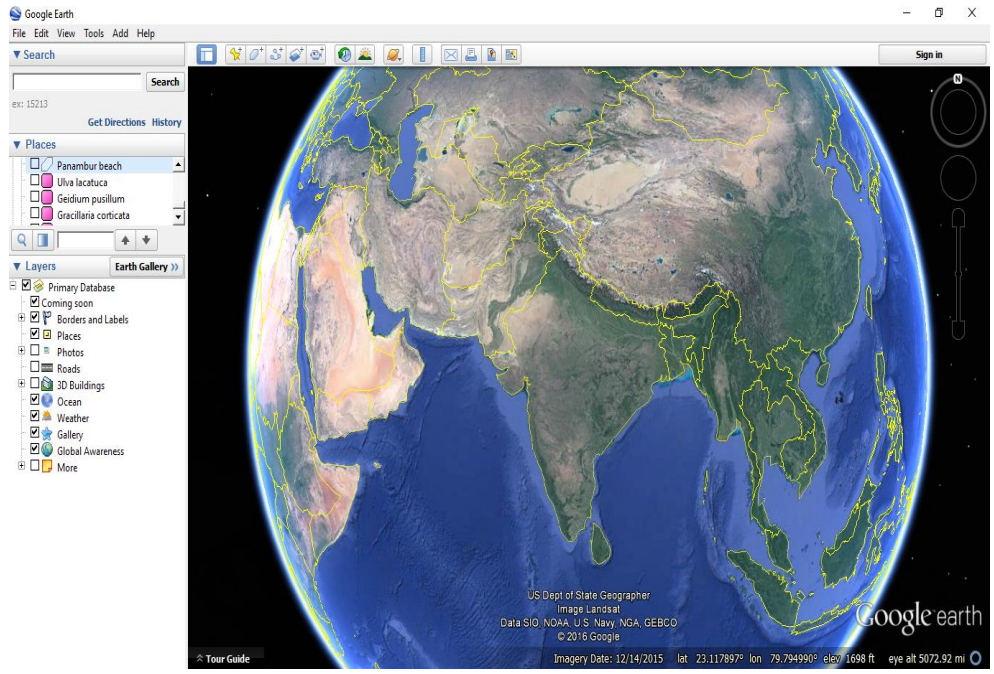
10. Plant erect, foliaceous, margin entire, majenta colour,
stallate chloroplast with central pyrenoid .....Porphyra
Plant tufted, dichotomously branched .....11.
11. Plant cartilaginous, terate to compress, saxicolous .....Gelidium
Plant slender, cylindrical stolon .....12.
12. Plant cartilaginous, erect, stolon give rise to erect and
decumbent branches above and coarse short rhizoidal
branches below, axial branches are cylindrical or compressed,
stichidia are borne on the swollen tips .....Gelidiella
Plant bushy, wiry clumps .....13.
13. Plant bushy, wiry clumps, lower branches some what
creeping, upper erect tapering towards the apex .....Gelidiopsis
Plant branched, axis cylindrical or flattened.....14.
14. Plant branched, flattened, structurally composed of
central medulla surrounded by cortex .....Gracilaria

Plant cylindrical, profusely branched bearing
short acute alternate branches .....15.
15. Plant erect radially branched, cylindrical, commonly
beset with numerous thorn like branchelets. Tetraspores
and cystocarps in swollen alternate branches.....Hypnea
Plant erect, cartilaginous, wart like determinate branchlets.....16
16.Plant erect, cartilaginous, determinate branches
beset with wart like branchlets .....Laurentia
Plant erect, cylindrical, determinate branches acute.....17
17. Plant erect, cylindrical, delicate in texture, determinate
branches acute, stalked antheridia, oval cystocrap .....Chondria
Plant erect, flattened to foiliaceous .....18.
18. Plant erect, flattened with slippery blade, branches
pinnate to irregular, texture firm, dark purple colour .....Grateloupia

10.1 SPATIAL MAPPING -SEAWEEDS DISTRIBUTION

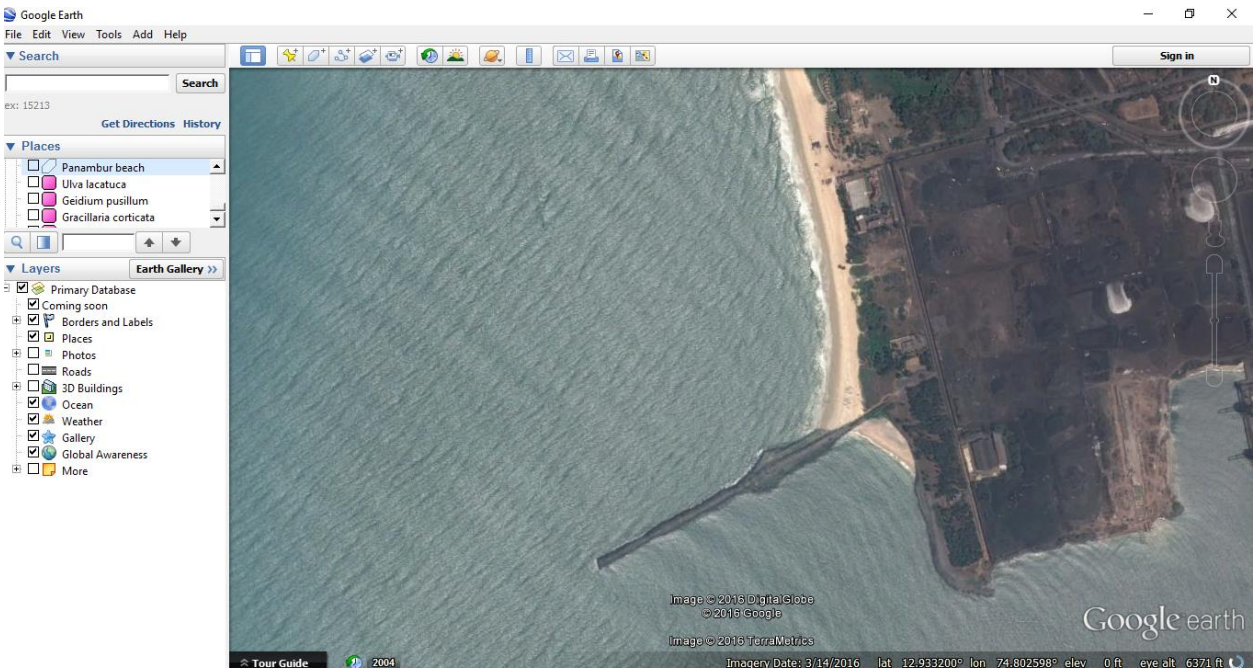
10.1.1 Digitizing the Rocky shores

1. Downloading google earth (http://www.google.com/earth/)

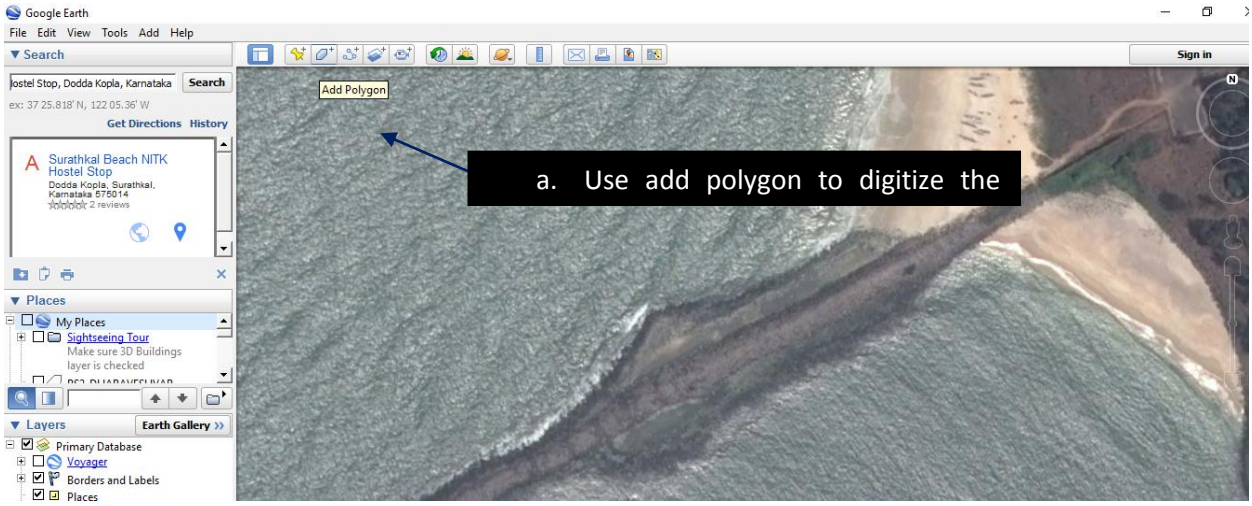


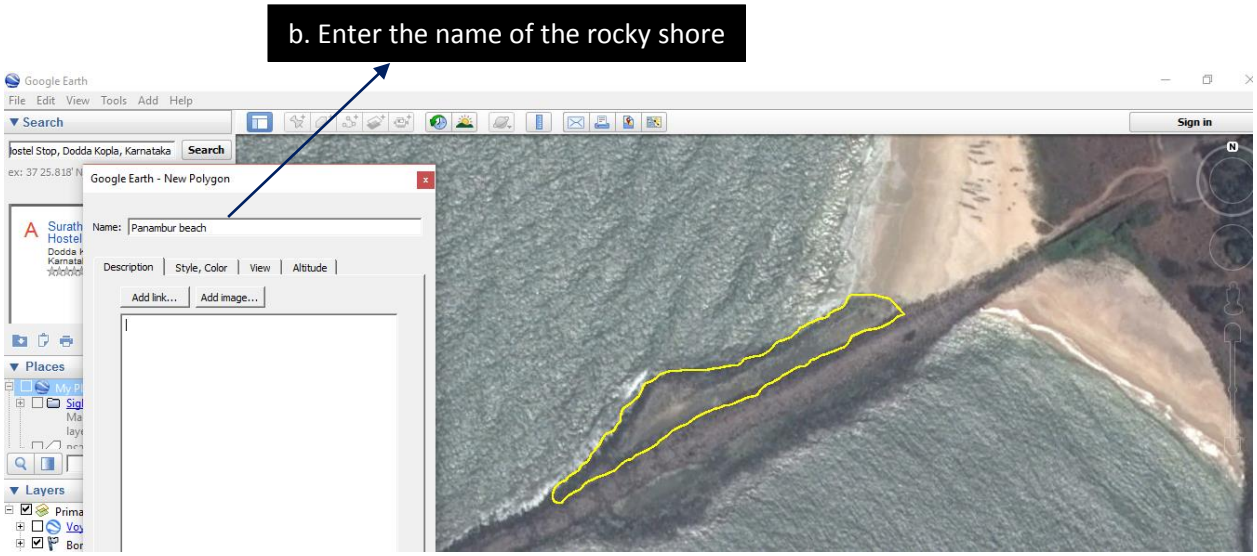
10.1.2 Installing Google earth

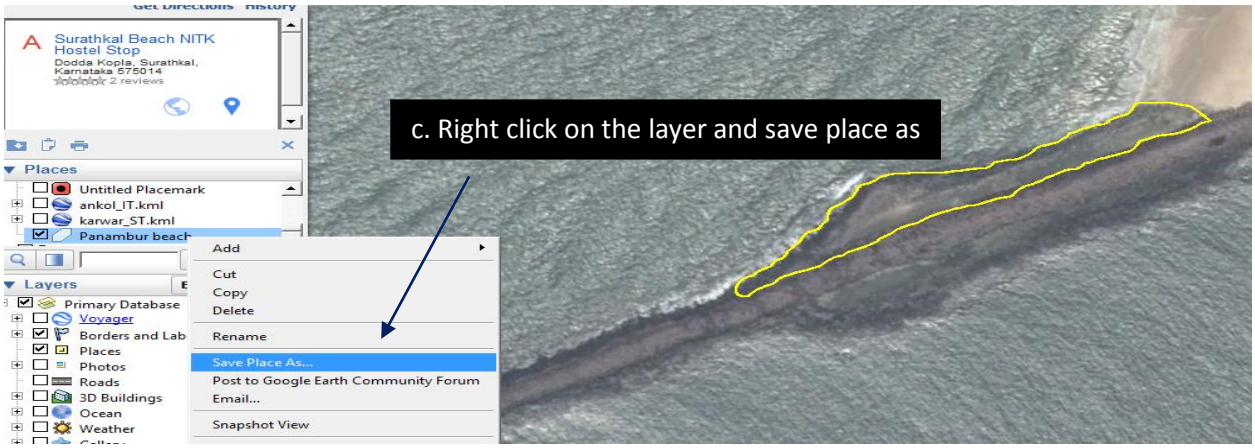
Zoom to the desired location /rocky shore

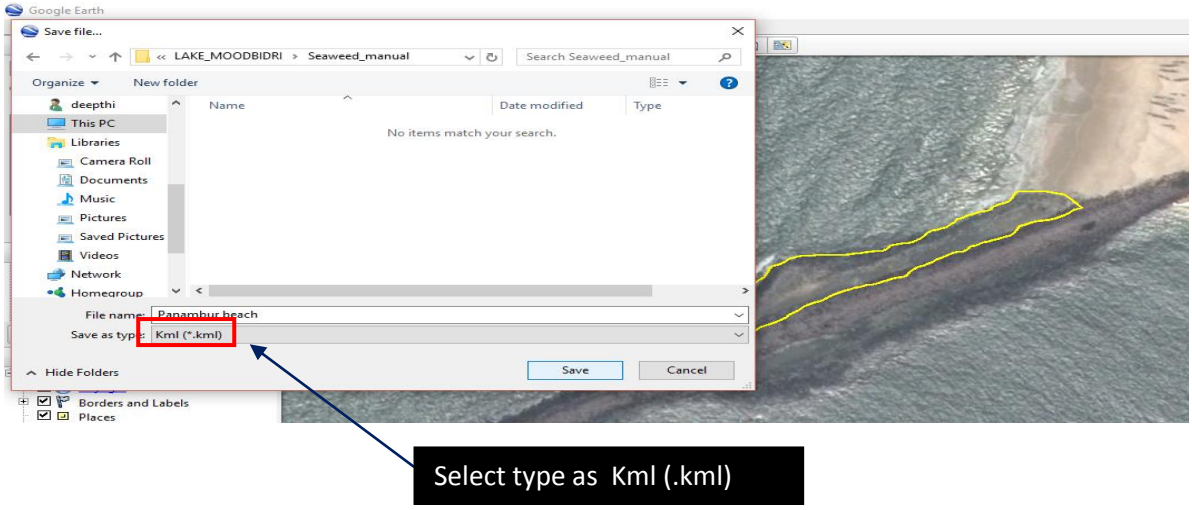


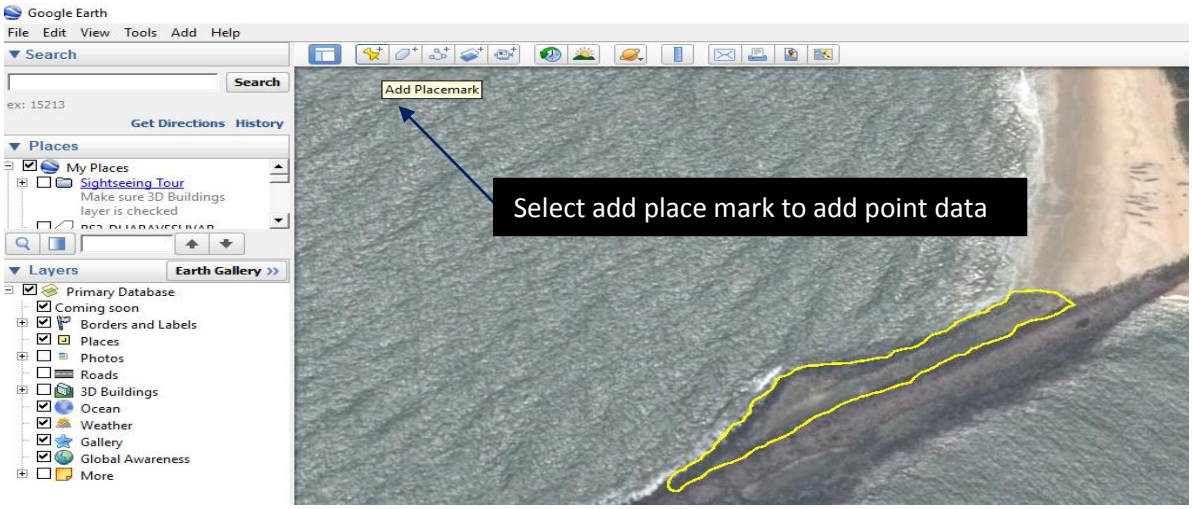
10.1.3 Using the polygon tool digitized the rocky shore











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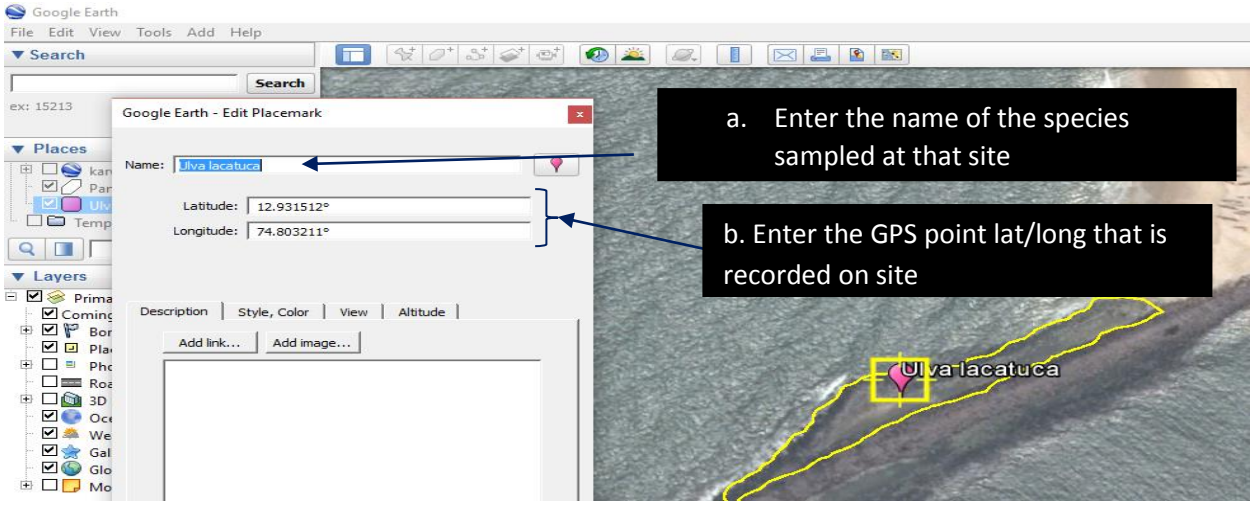

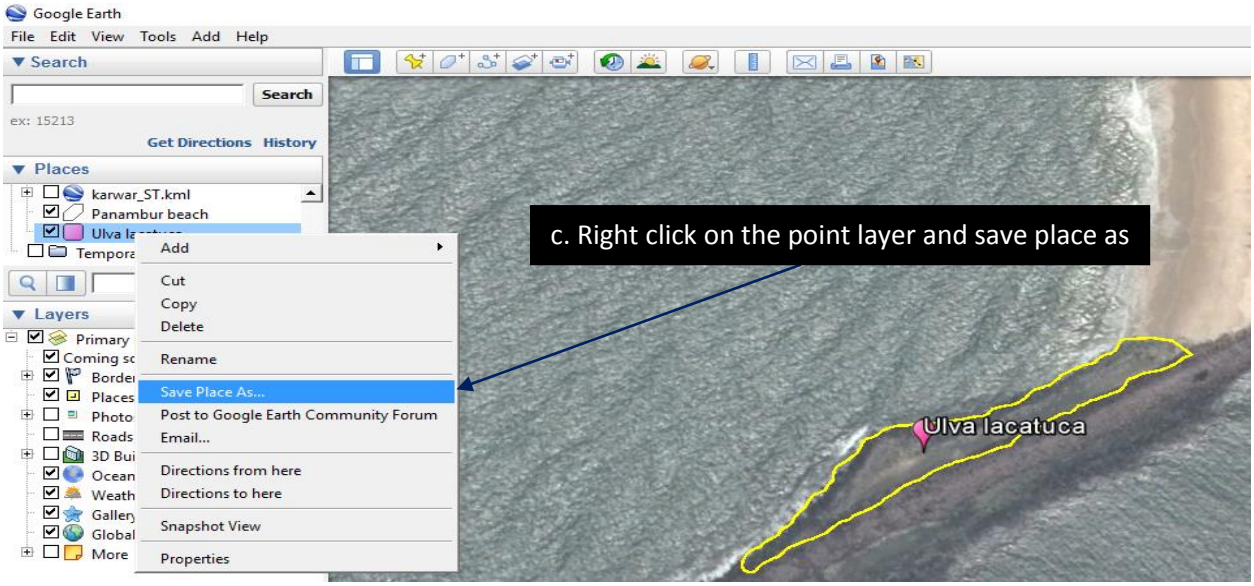
Google Earth
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Cut
Copy
Delete
Rename
Save Place As...
Post to Google Earth Community Forum
Email...
Directions from here
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Snapshot View
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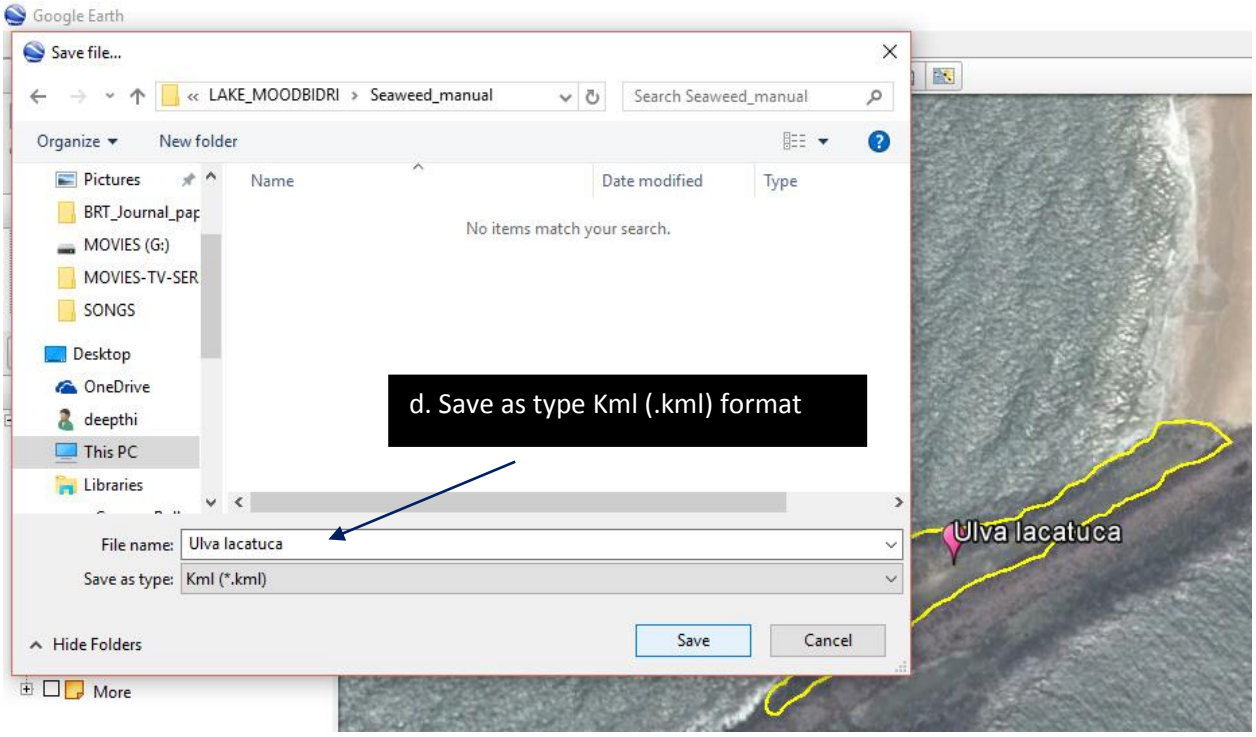
Primary
More
c. Right click on the point layer and save place as
Ulva lacatuca

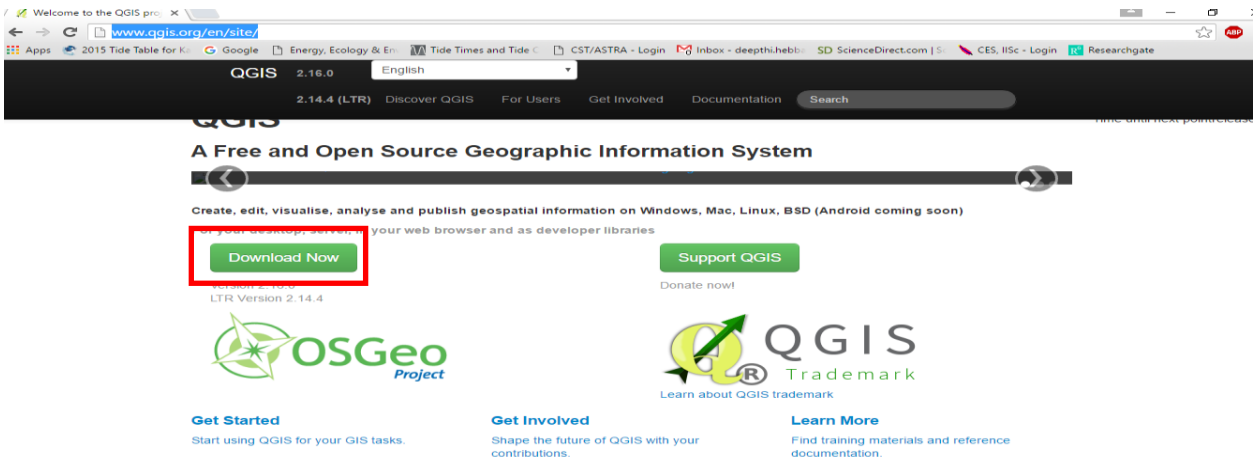

Google Earth
Save file...
LAKE_MOODBIDRI › Seaweed_manual
Search Seaweed_manual
Organize
New folder
Pictures
BRT_Journal_pap
MOVIES (G:)
MOVIES-TV-SER
SONGS
Desktop
OneDrive
deepthi
This PC
Libraries
Name
Date modified
Type
No items match your search.
d. Save as type Kml (.kml) format
File name: Ulva lacatuca
Save as type: Kml (*.kml)
Hide Folders
Save
Cancel
More
Ulva lacatuca

QUANTUM GIS (QGIS) – SPATIAL MAPPING TOOL

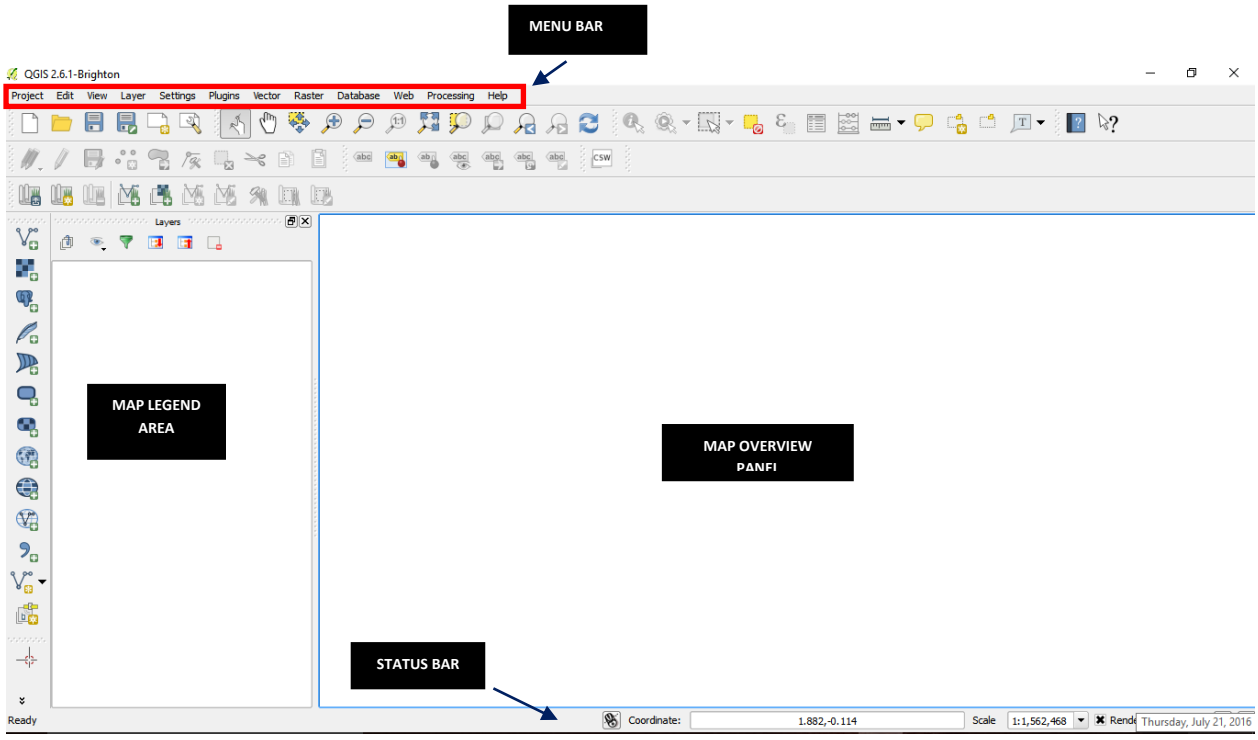
QGIS is a Free and Open Source GIS for manipulating geographical data (vector, raster), statistical analysis.

Downloading and Installing QGIS

- Download QGIS from http://www.qgis.org/en/site/
- Click on download now you will find the list of versions available.
- Download the latest stable version.



- QGIS main page will be opened as shown below.

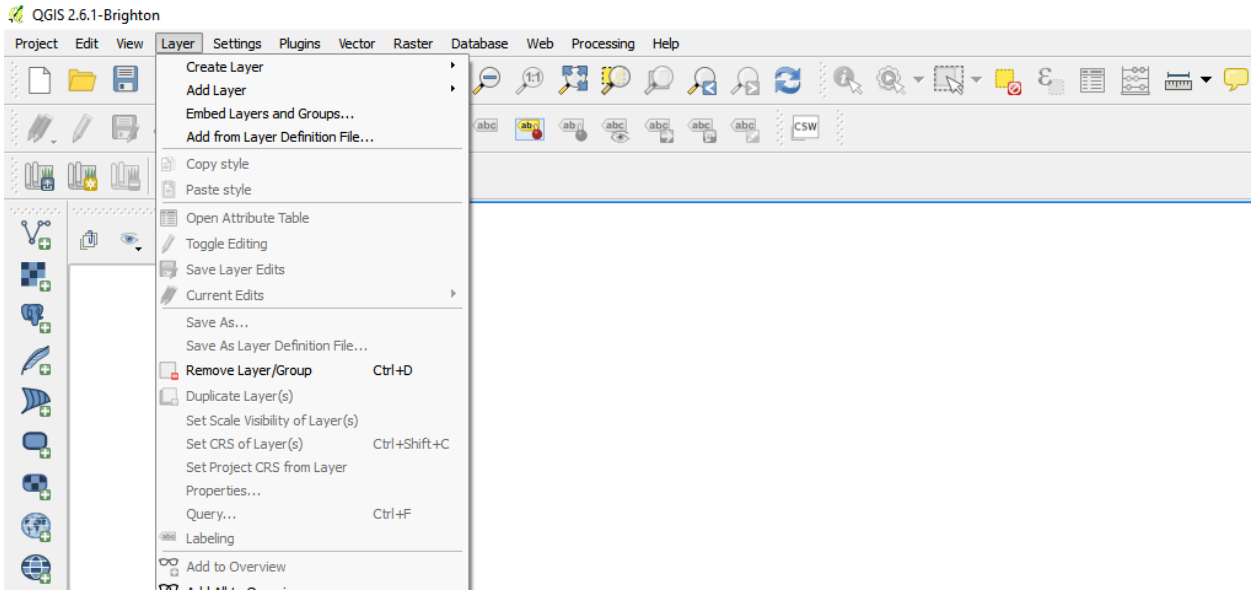


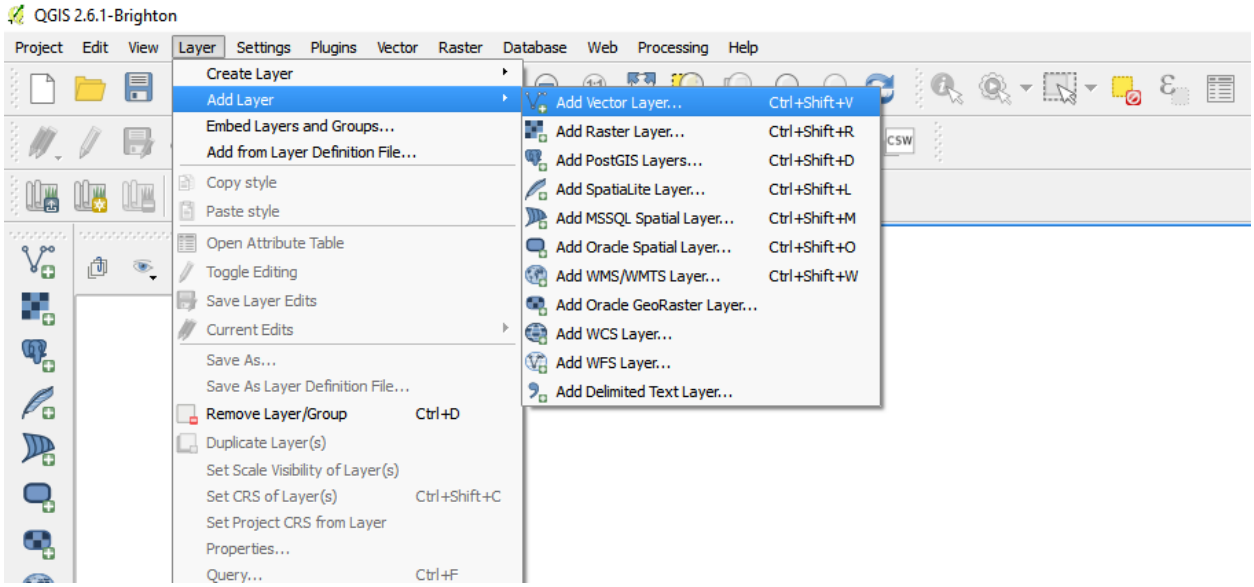
- The menu bar provides access to numerous QGIS features.

- The toolbars offer additional tools for interacting with the map. Hold the mouse over the particular icon, a short description of the tool's purpose will be displayed.
- The map legend area sets the visibility
- The map overview panel provides a full extent view of layers added
- The status bar shows the current position in map coordinates

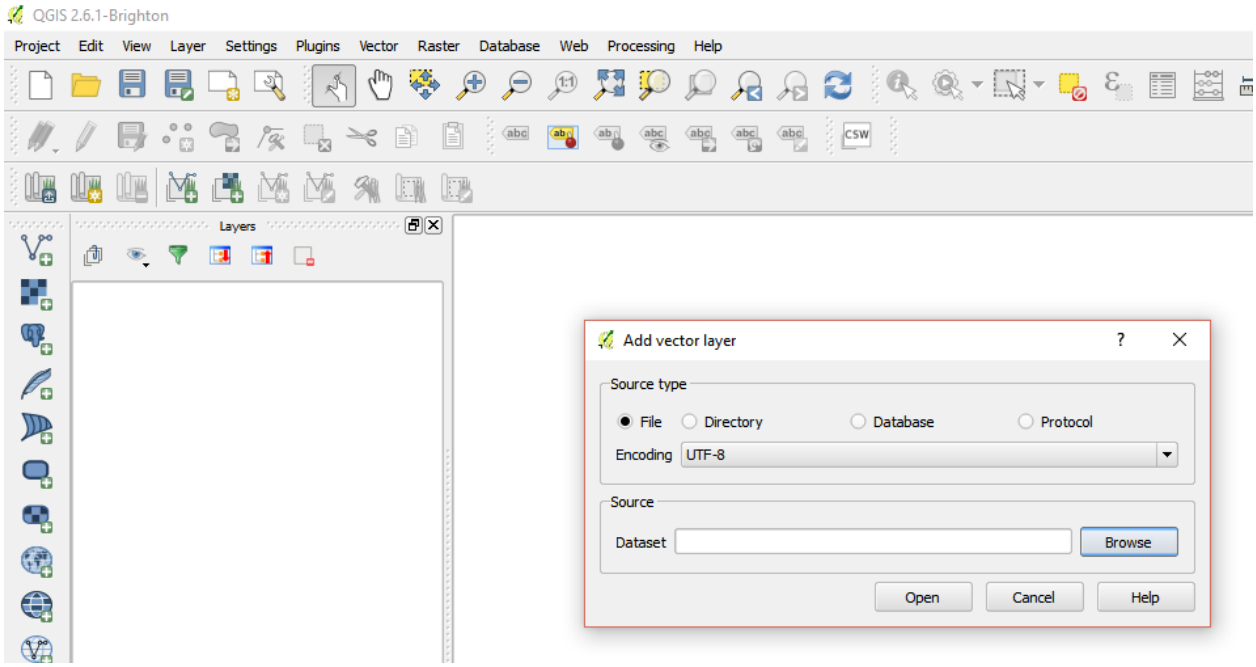
Importing vector layer (.kml file)

- Click on add layer go to add vector layer

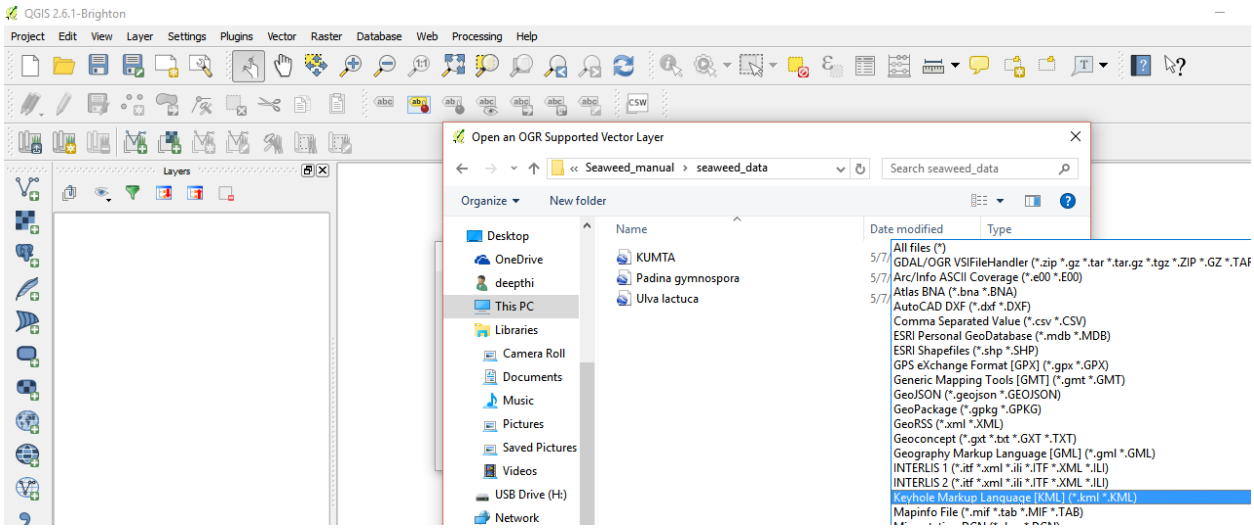




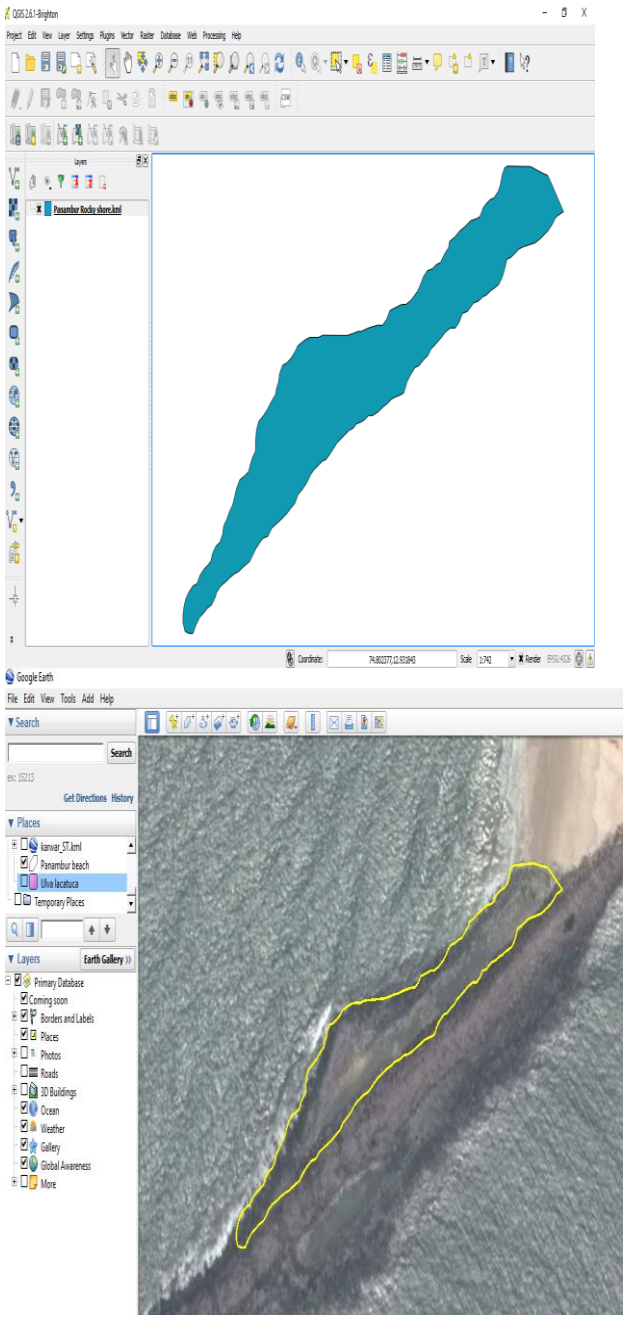
Import the .kml file by browsing



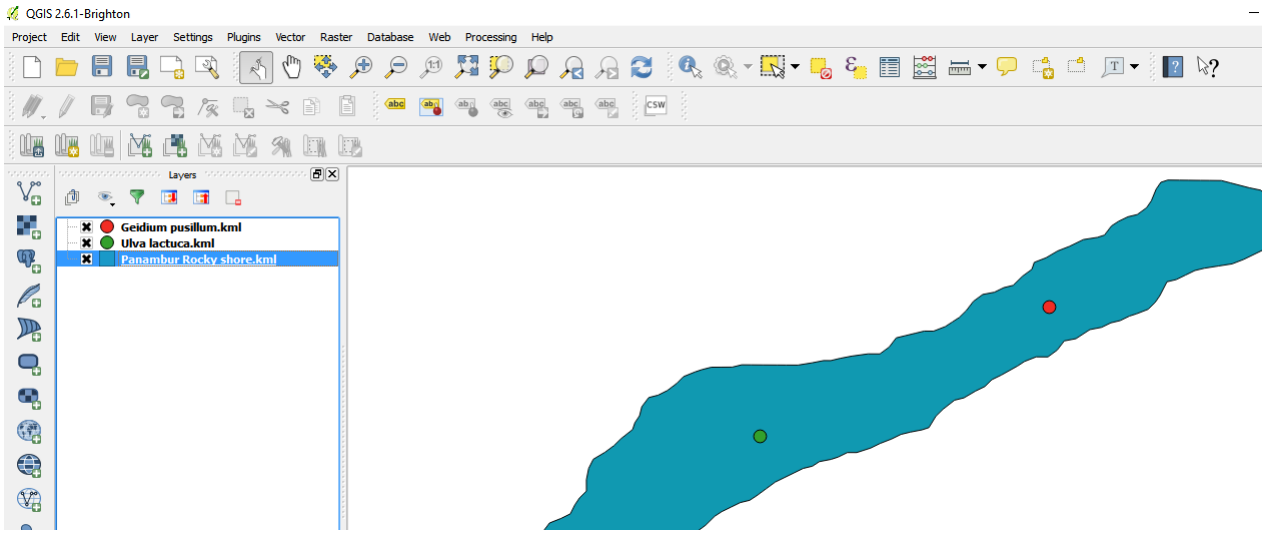
If the file is not visible click on keyhole markup language [KML] (*.kml *KML)



Vector layer displayed in the map overview

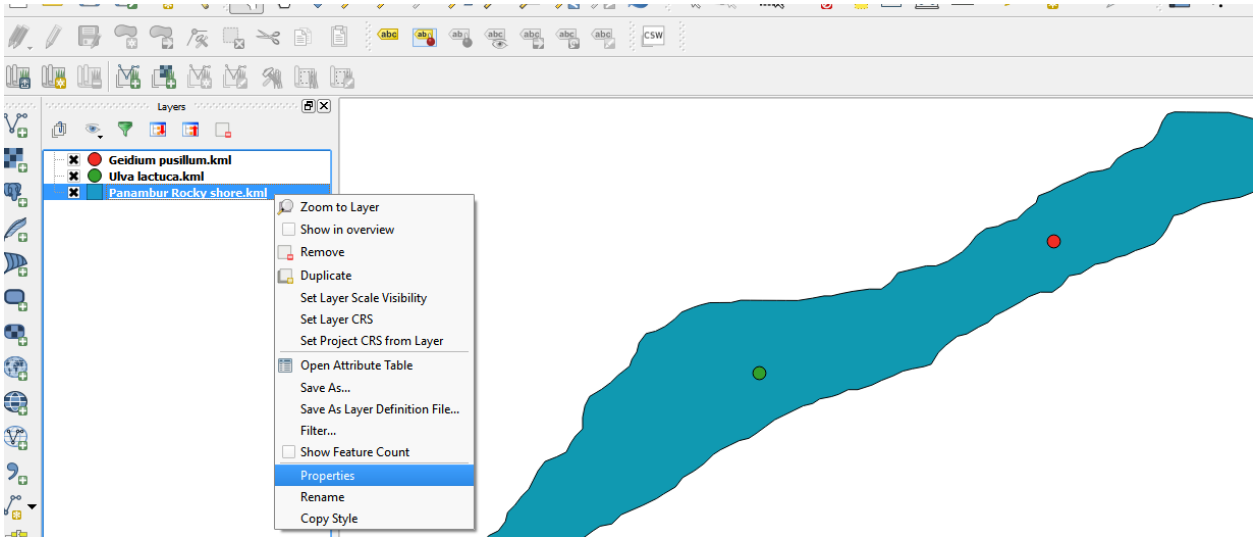


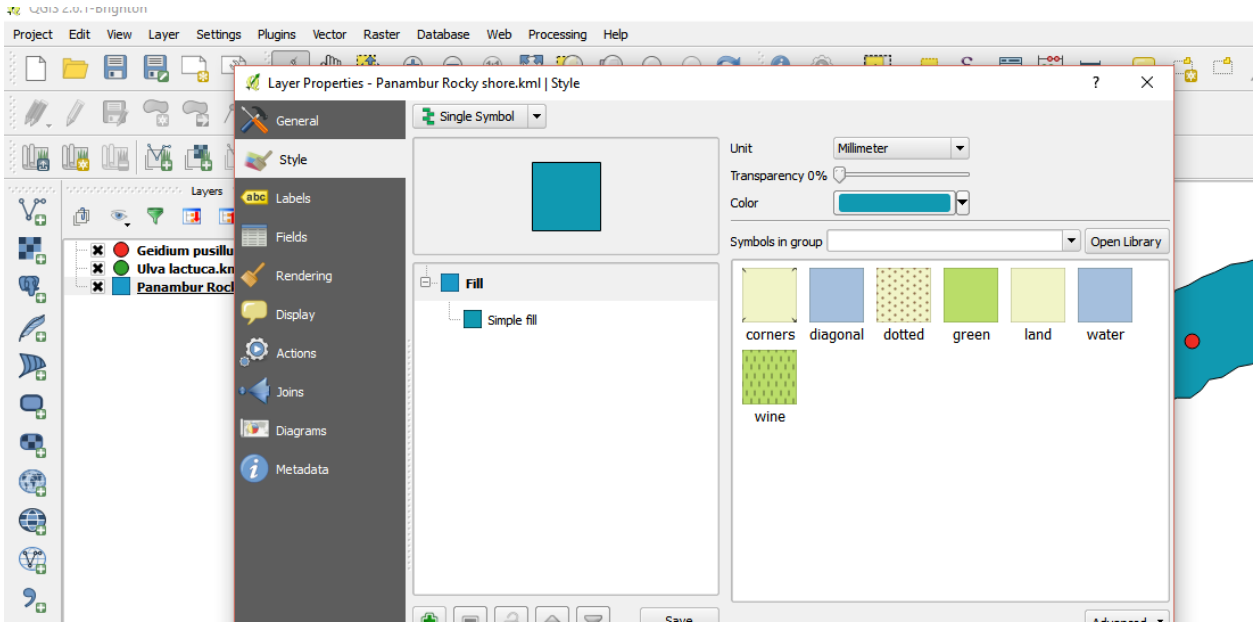
In a similar way import the point data in this case the seaweed species data

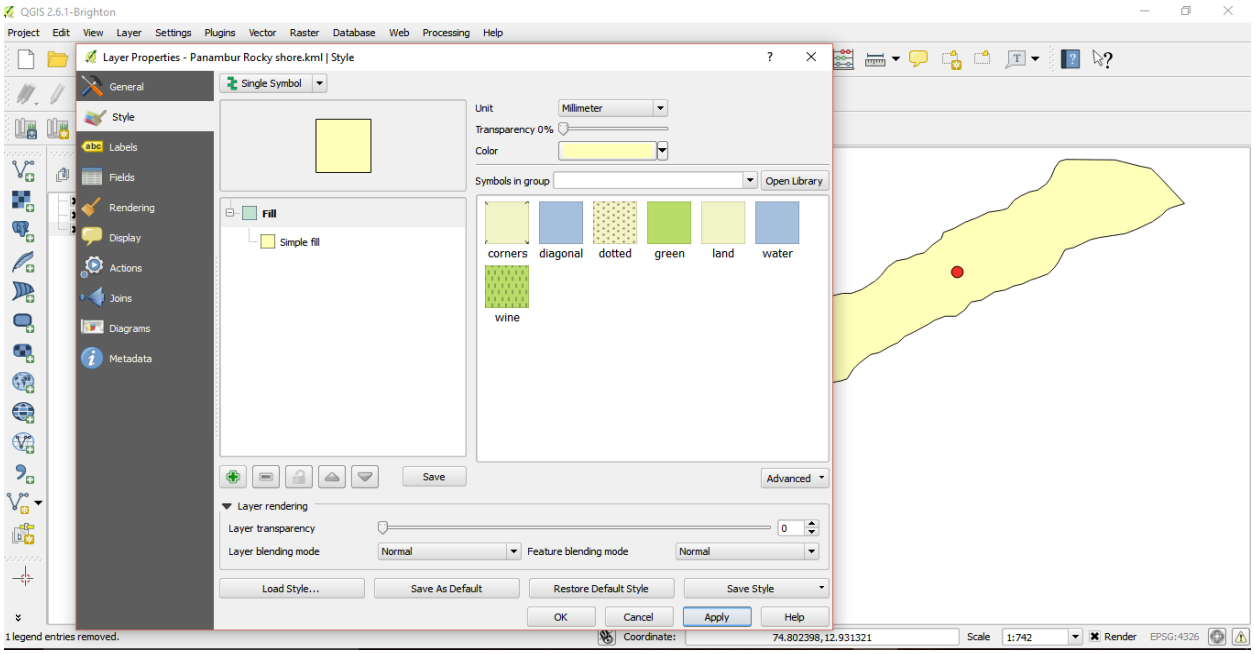


Layer properties such as size, colour, label, font can be edited

- **right click on the layer go to properties**

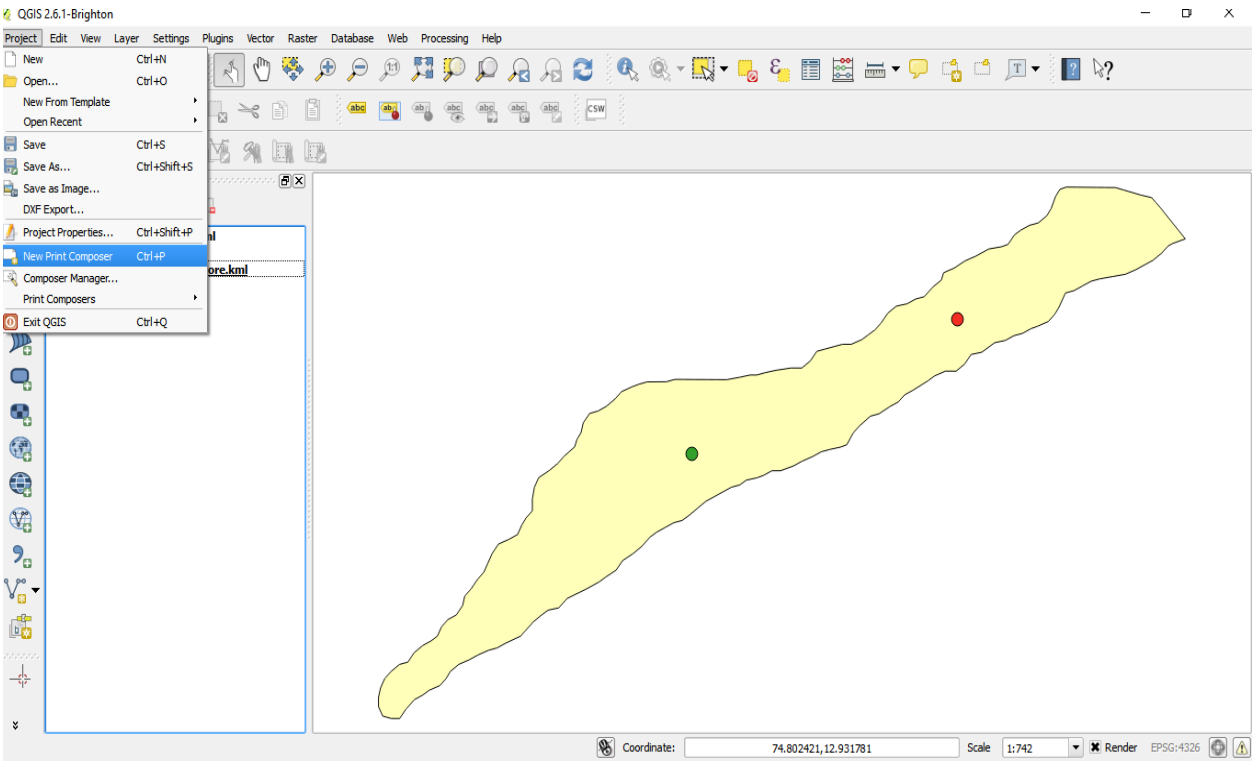






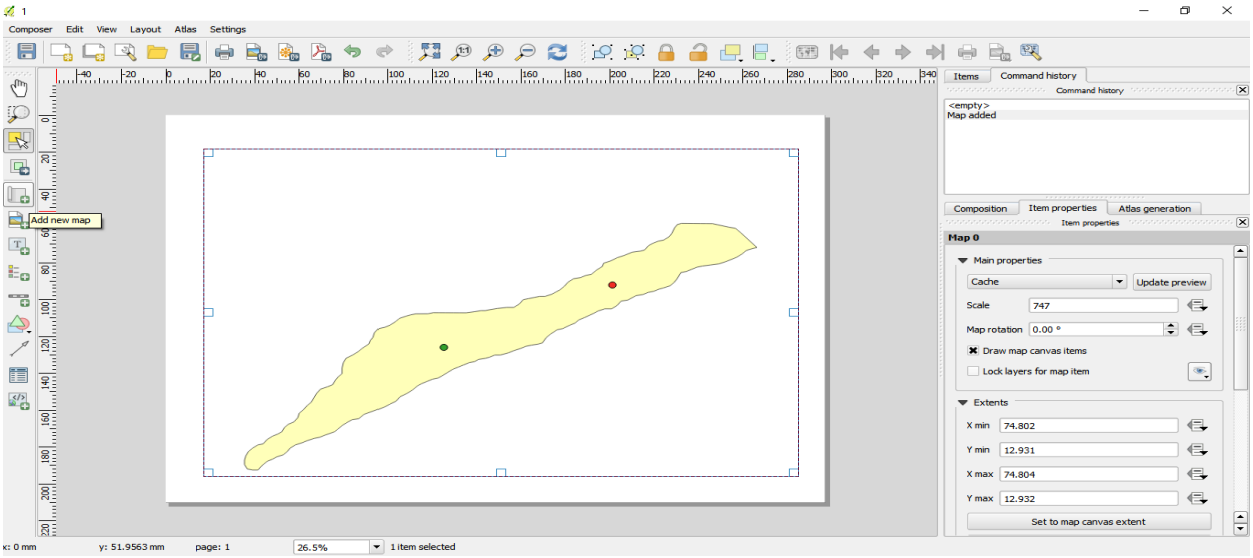
For final map representation

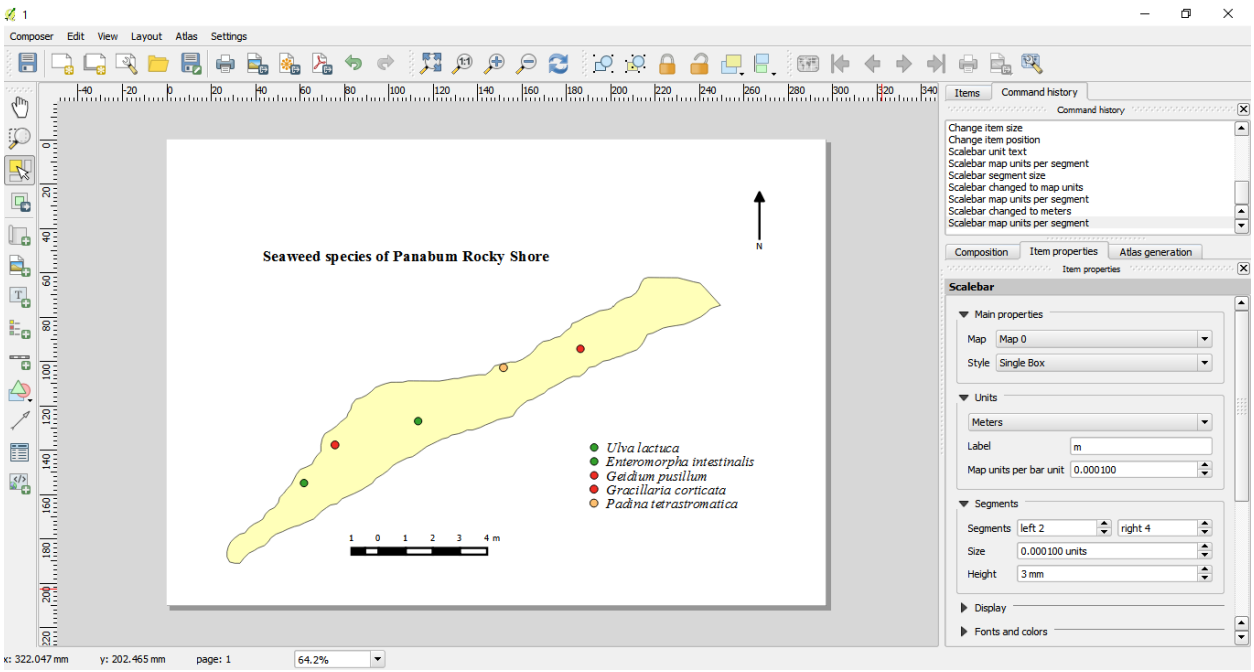
- **Go to project click on new map composer**
- **Give id as 1 a new map window opens**



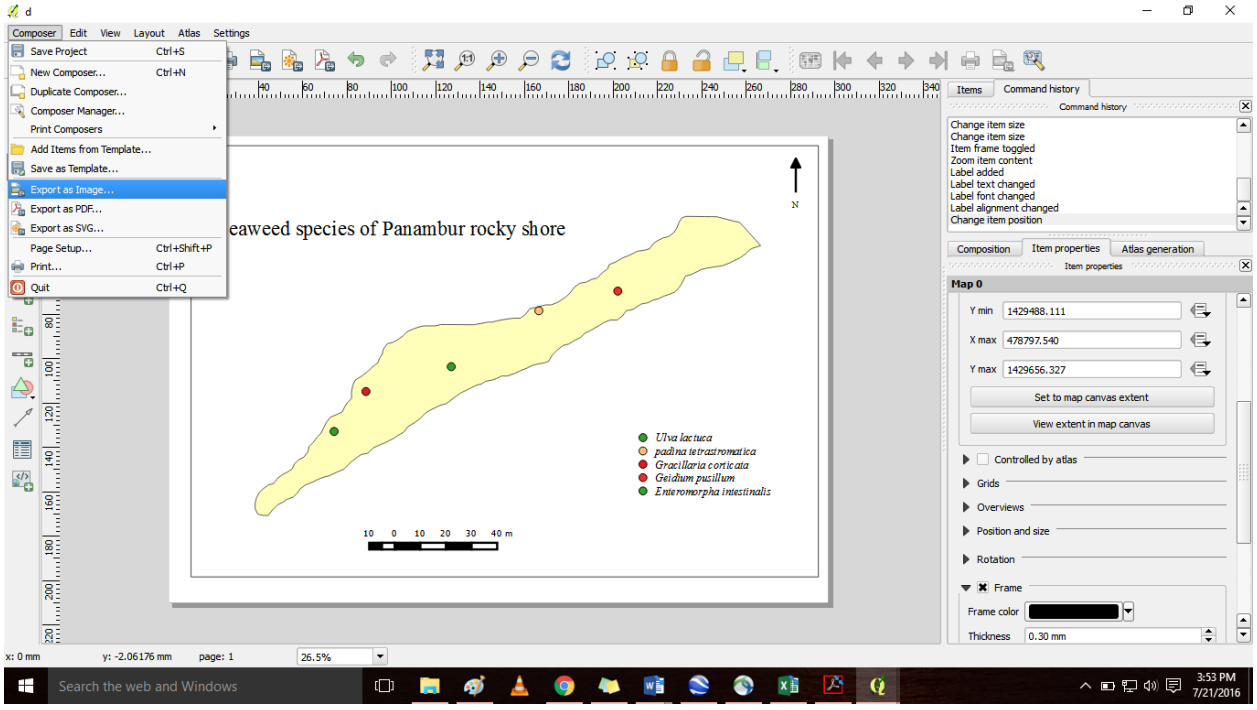
Add new map by dragging the cursor inside the window

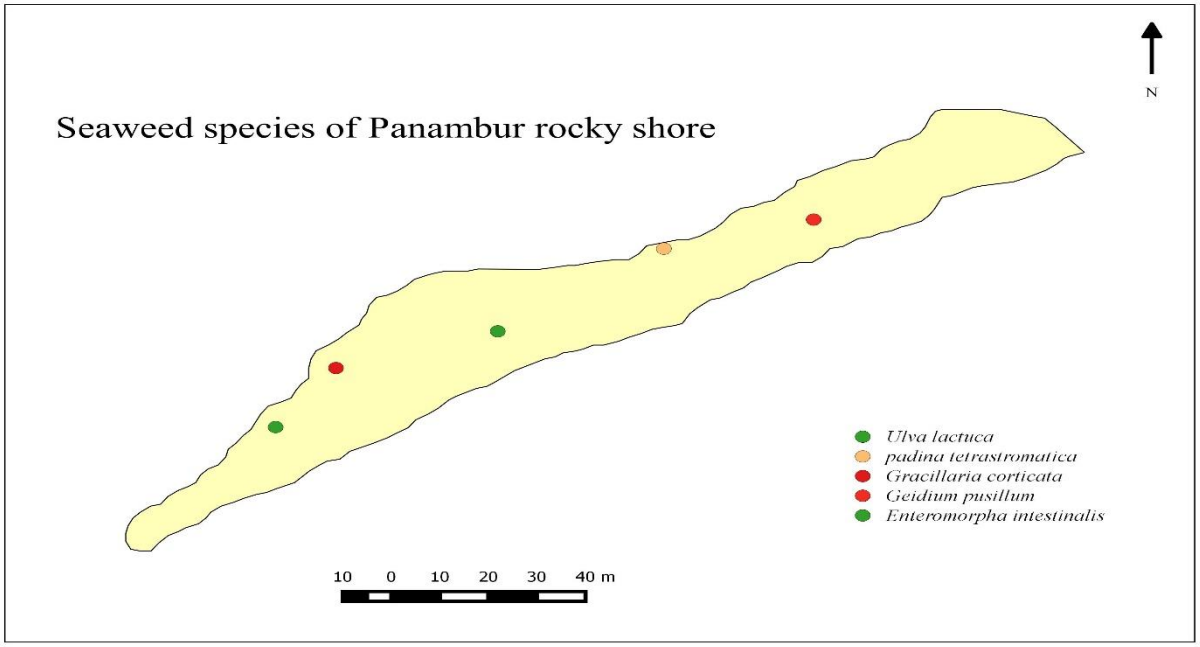
- **On the left hand side different icons are present which helps in adding legend, label and direction**
- **On right hand side these icons are edited in item properties**





Final map can be saved as jpg image





Help from QGIS:
http://www.qgis.org/en/site/forusers/index.html#
http://www.qgis.org/en/docs/index.html

References:

1. Algae Base , www.algaebase.org
2. Economically important seaweeds of India, special publication number 62, CMFRI,1995
3. WoRMS- http://www.marinespecies.org/
4. NIO bioinformatics-http://www.niobioinformatics.in/seaweed/introduction.html