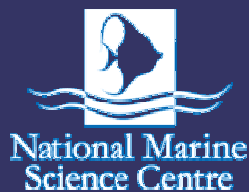


Subtropical reef analysis using CPCe software



Name: _____
School: _____
Date: ____/____/____



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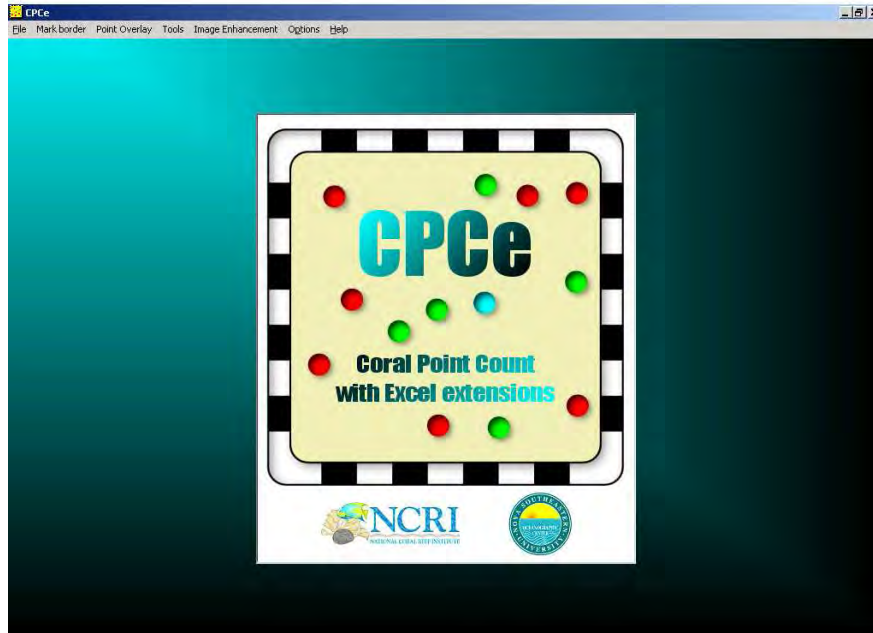
Subtropical

Australian subtropical reefs have extremely high species diversity with a high proportion of endemic species, suggesting that marine assemblages are ecologically distinct from other subtropical reefs of the world. Subtropical reefs are abundant along the north coast of NSW, with rock platforms extending further than 150m from many headlands. Rock platforms are not restricted to the coast and many midshelf reefs and island reefs occur along the NSW coast.

Rocky reefs provide substrate for attachment of many sessile (non moving) organisms such as algae and marine invertebrates (hard and soft corals, sponges, ascidians, bryozoans to name a few). Patterns of habitat types vary according to the many local characteristics of the region. Factors that determine these habitat types within a particular area include: the amount of insulation (light intensity and penetration); wave-action; tidal movement; composition, complexity and size of the substratum; siltation; and abrasive action caused by suspended particles. Biological factors also contribute to the composition of subtropical reef habitats. Interactions such as competition, predation, overgrowth and abrasion caused by other organisms may determine changes in dominant species over small and large time scales.

The Solitary Islands Marine Park subtidal communities are dominated by hard corals and represent the most southern distribution of hard coral communities on the mainland of eastern Australia. Ninety species of corals have been identified within the region and corals tend to dominate island reefs, with coral dominance decreasing at nearshore locations, where algae (*Ecklonia radiata*, red algae and calcareous algae) and filter feeding invertebrate species (ascidians and sponges) occupy much of the substratum. The combination of tropical, subtropical and temperate marine organisms present within the marine park indicates that the SIMP is important not only for its species diversity, but also for the unique biogeographic composition of fauna and flora.

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The CPCe (Coral Point Count with Excel extensions) is a program that provides a tool for the determination of benthic (organisms that occur on the bottom of the sea) cover using transect photographs.

Still images of the benthos are overlaid with random points and organisms occurring under each point are categorised (i.e., hard coral, soft coral, green algae etc.)

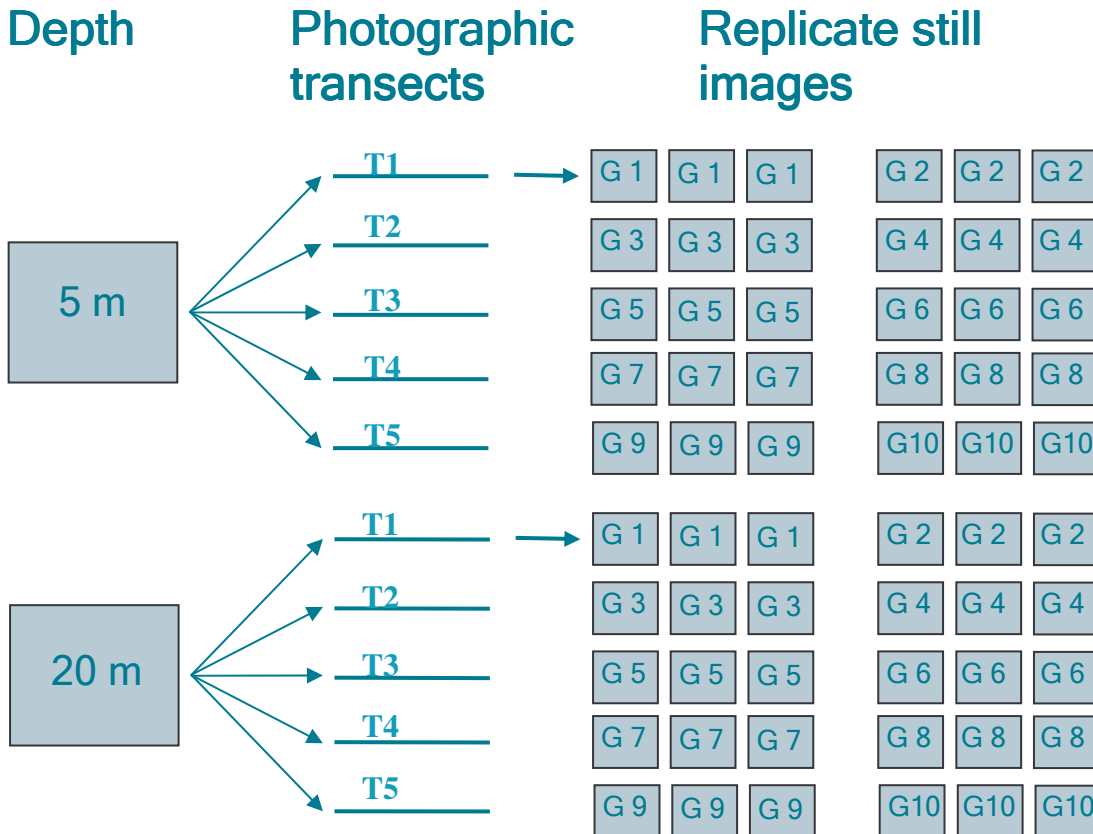
Average percentage cover of each category can be determined using replicate images, enabling comparison at different spatial and temporal scales.

m

- Become familiar with a computer software program used by ecological researchers
- Determine the benthic composition at two depth
- Contrast dominant organisms associated with each depth
- Discuss the factors which help to shape the benthos at different depths

etho

St e



- Two depths (5 & 20 m) were monitored using five photographic transects at each depth.
- Six replicate images were randomly produced along each five metre transect. These images have been divided into groups of three, in which each group (total of 10) will analyse three images from each depth.
 - For example, group 1 (G 01) will analyse three images from transect 1 from each depth using CPCe software.

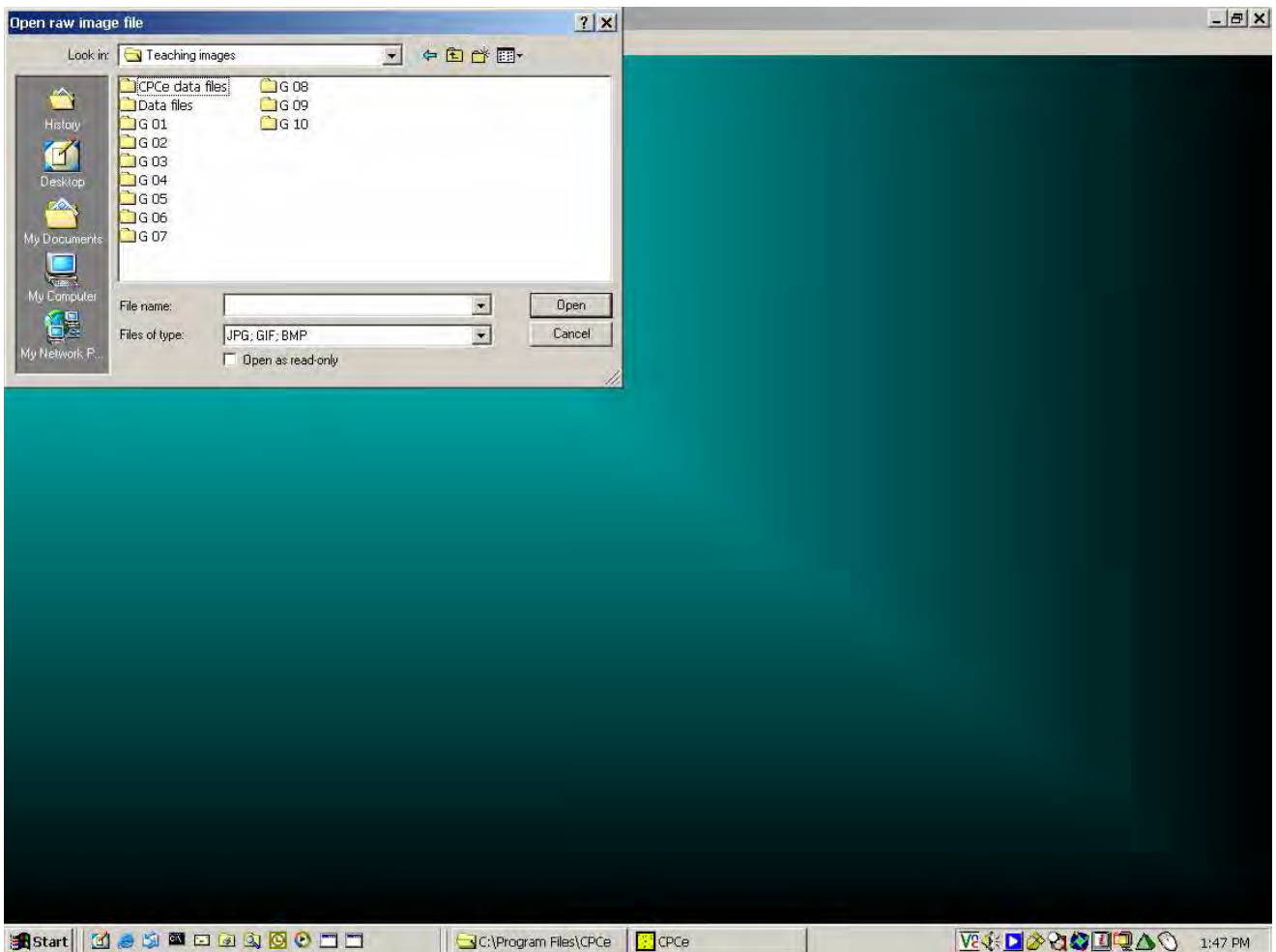
Using CPCe software to analyse images

Practical

- Students will be divided into 10 groups (G 01-G10)
- Each group opens CPCe by clicking on the icon at the bottom tool bar

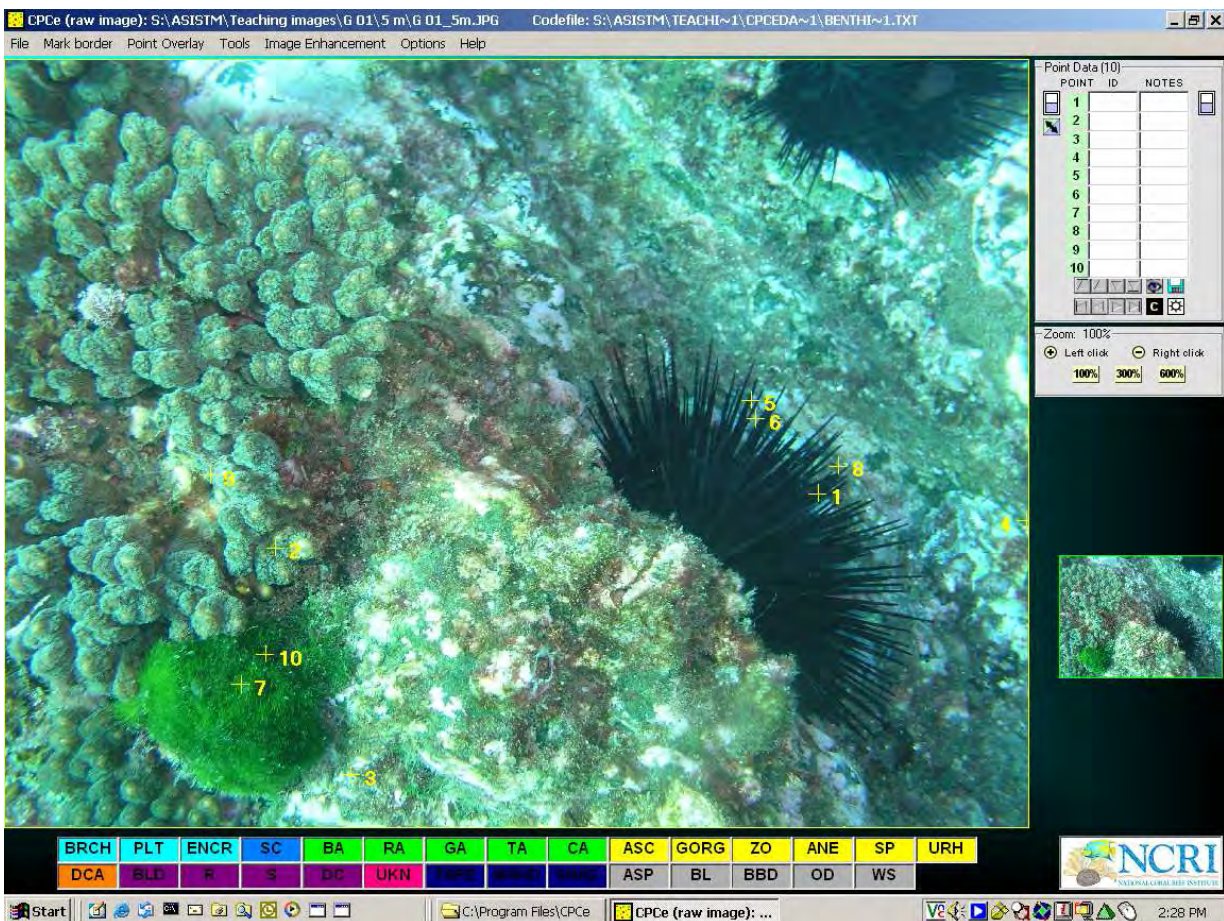
The teacher associate will have previously opened the CPCe program and routed the program to open the folder where each group's images are stored, which are in the Teaching images folder.

Procedure



How to make it

- Point the mouse onto your group folder and double click (i.e., group 01 select G 01 folder)
- You will see two folders within each groups individual folder (5 & 20 m)
- Open 5 m folder and click on the first image file
- Once the image has opened ensure that the specify the border boundaries dialog box indicates (use entire image)
- In the Data point position box click on the and enter 10 into the number of random points box and click overlay point button. Ten random points are now superimposed on the image



- Each benthic category is displayed under the image (refer to handout for benthic descriptions) and the organisms under the points can be classified according to these categories
- Click in cell 1 ID column (top right of screen), the corresponding point will be highlighted red on the image

Subtropical reef analysis using CPCe software Student Activity Workbook 4.2

- Identify the organism under this point using the categories listed and click on the corresponding category button below the image (i.e., BRC branching coral)
- Each number will be highlighted red and organisms below each point inserted as above

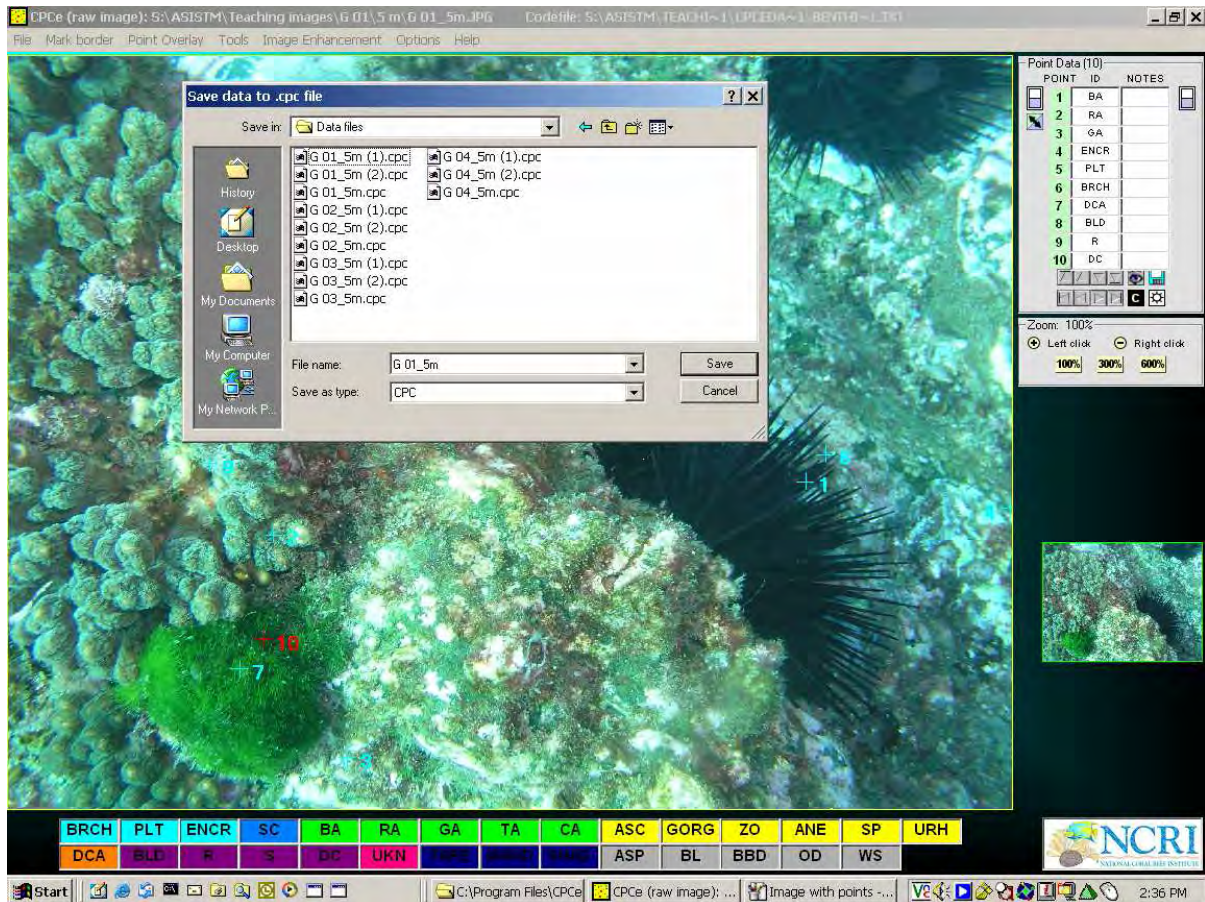
The to of the mo e ca e to om the ma e o o t

- left button will zoom in
- right button will zoom out
-

ce e th c cate o e ha e ee a e to each o the o t a e the ma e a o l o :

- Click on the file dropdown menu and point to save, clicking on save data to .cpc file
- In the save dialog box click on **m com te do** (left side of box), double click on the **t o l e o ha e drive,** then click on the **S S** folder followed by the **e a c h** **ma e o l e** and finally the **Data**
- The screen should now look similar to below

Subtropical reef analysis using CPCe software Student Activity Workbook 4.2



- Save the image file by clicking on the save button, please note that the file name will correspond to the raw image file name

D **N** **N** **N**

- All the group image files will be placed into this Data folder for later batch processing and software analysis completed by the teacher associate.
- To open the next image click on file dropdown menu, select open raw image file
- The raw image dialog box with the groups images from the 5 m folder will be displayed, double click on the next image file to be analysed.
- Repeat the above methods to assign benthic categories to this image and save.
- Repeat for image three, then open the **m** folder for your group and repeat CPCe analysis for each image.

nce the benthic categories are assigned to all images from all the 10 groups and saved into the Data file, the teacher associate will use these files to determine the benthic composition at the two sites which will be displayed graphically.

