



5th GEF
BIENNIAL
INTERNATIONAL
WATERS CONFERENCE

26 - 29 OCTOBER 2009 | CAIRNS AUSTRALIA

Innovation Marketplace Review/Project AWARE “Coral Watch” Workshop

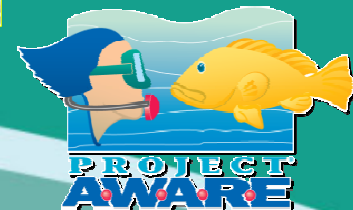
[Project AWARE Workshop: Innovative Community-Based Method for Monitoring Coral-Bleaching and Reef Health](#)
[Project AWARE](#)



Make Your Dives Count: Monitor Coral Reefs



CORALWATCH



Overview

- **What is CoralWatch?**
- **Why CoralWatch?**
- **How does it work?**
- **What do you do?**
- **What do volunteer divers do?**
- **What's next?**





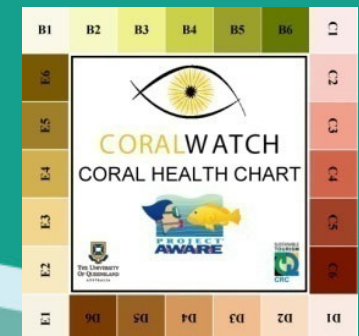
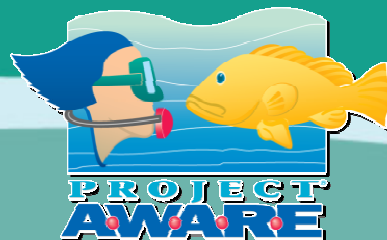
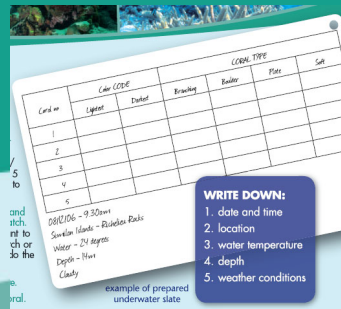
THE UNIVERSITY
OF QUEENSLAND
CENTRAL CAMPUS

What is CoralWatch?



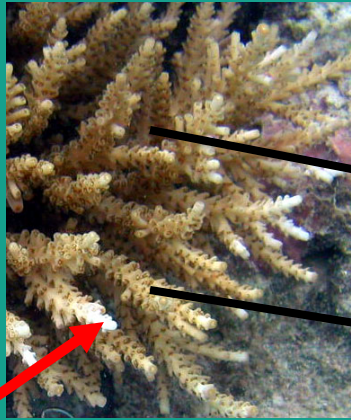
● Coral Health Monitoring Protocol

- Standardized method to evaluate bleaching
 - Use of CoralWatch Chart
- Monitoring change in the intensity of coral color
 - Rotate, match, record
- Simple, low cost, noninvasive methodology to be used by volunteers
 - A chart, a slate and a flashlight is all you need
- Centralized data reporting and feedback on the health of the reefs you monitor

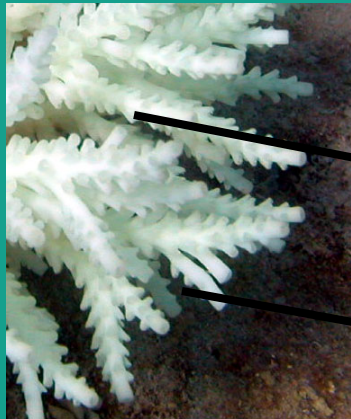


What is CoralWatch?

Lightest and darkest shade



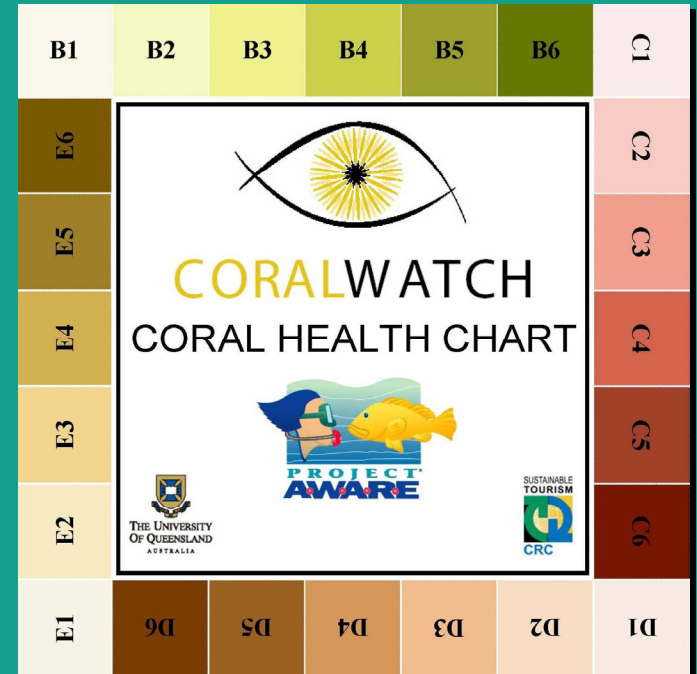
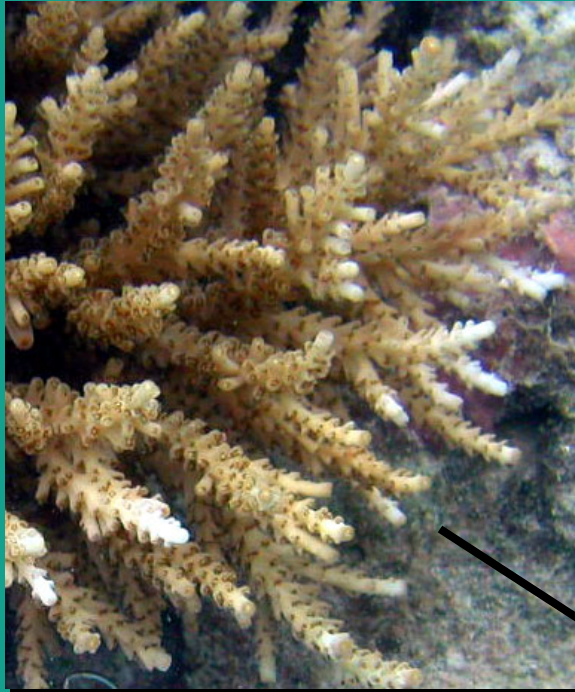
NOT TIPS!



Lightest and darkest shade

	B1	B2	B3	B4	B5	B6	C1
	E6						C2
	E5						C3
	E4						C4
	E3						C5
	E2						C6
	E1						D6

What is CoralWatch?



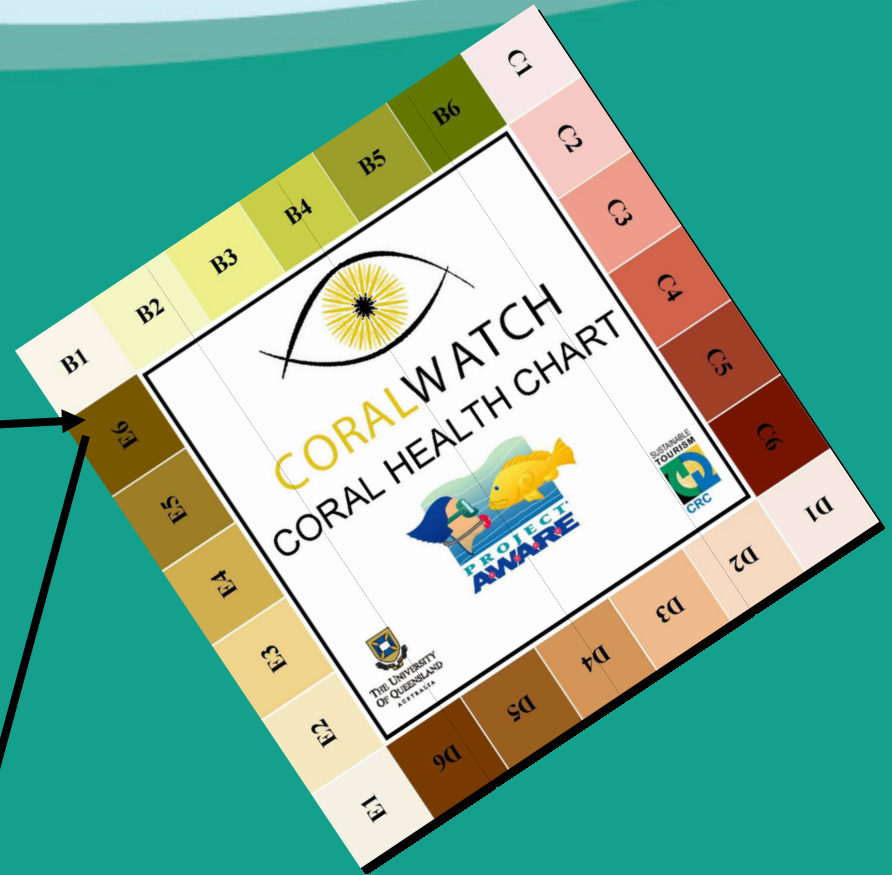
Coral Number	Colour Code				Coral Type			
	L=Lightest D=Darkest				Br=Branching	Bo=Boulder	Pl=Plate	So=Soft
1	L:	E5	D:	E6	Br	Bo	Pl	So

What is CoralWatch?



Coral Number	Colour Code		Coral Type			
	L=Lightest D=Darkest		Br=Branching	Bo=Boulder	Pl=Plate	So=Soft
1	L: E5	D: E6	Br	Bo	Pl	So

What is CoralWatch?



Coral Number	Colour Code L=Lightest D=Darkest	Coral Type Br=Branching Bo=Boulder Pl=Plate So=Soft
1	L: E5 D: E6	Br Bo Pl So

Why CoralWatch?

- Coral reefs are in danger of disappearing from temperature induced bleaching in the next 30-50 years
- Need large amounts of data
- Your contribution and opportunity to educate others



Why CoralWatch?

- **Global stressors**
 - ◆ **Global warming**
 - ◆ **Ocean acidification**
- **Local stressors**
 - ◆ **Pollution**
 - ◆ **Sedimentation**
 - ◆ **Overfishing**
 - ◆ **Physical Damage**



Why CoralWatch?

Need Data: 900+ registered operators in 80 countries and territories



Why CoralWatch?


- 18,000+ samples from 180+ reef/dive sites reported by 150 groups to date
- Why do we need every one of you?
 - ◆ 18000/150 means 120 corals per group
 - ◆ Power is in numbers **reported**
- Need data – **now** – on a global scale, frequently, and preferably, regularly reported

Why CoralWatch?

- **Regular monitoring helps scientists and informs conservation**
 - ◆ **Not enough scientists – but lots of divers**
 - ◆ **Scientists can't be there long enough – but you can monitor continuously**
- **But EVERY piece of returned data can help answer important questions:**
 - ◆ **What are the patterns of bleaching and recovery?**
 - ◆ **How long and severe are the bleaching events?**
 - ◆ **Are corals recovering or adapting to rising sea temperatures?**

How does it work?

- The science behind the protocol
- Monitoring tools
- The activity
- Reporting the data
- Developing your plan

B1	B2	B3	B4	B5	B6	C1
E6						C2
E5						C3
E4						C4
E3						C5
E2						C6
E1						D6



The Science Behind the Protocol

Healthy colors are important for survival



Without its distinctive colors this cleaner fish would be in serious trouble

The Science Behind the Protocol

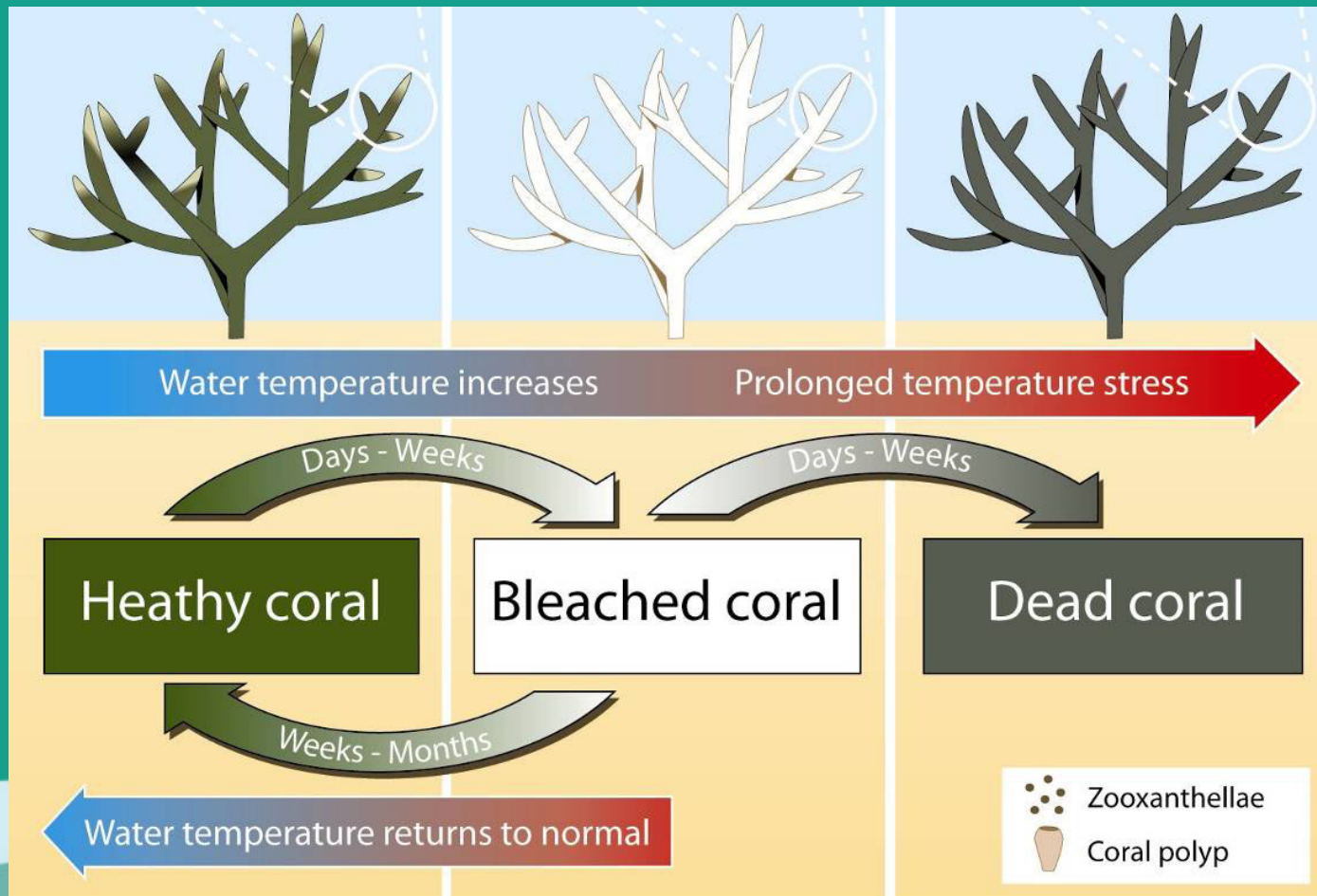


**Loss of colors represents a
serious problem for coral reefs**

In 1998, almost one-sixth of the world's coral colonies died during a mass bleaching event.

The Science Behind the Protocol

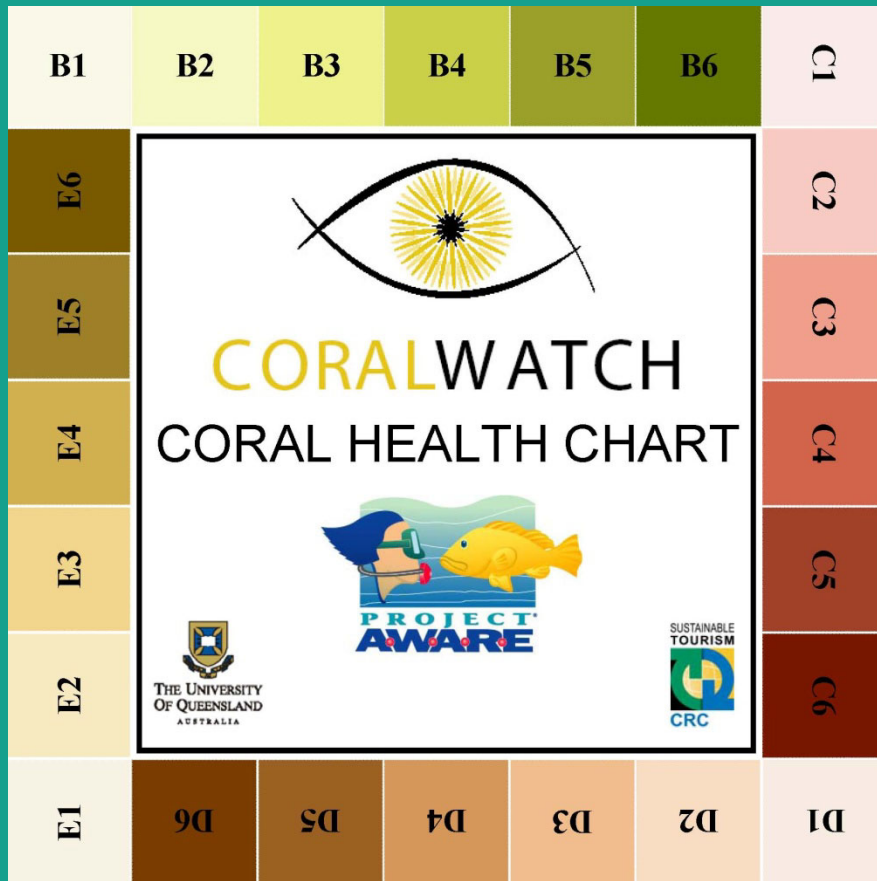
Stressed corals expel the symbiotic algae that give the coral food and color



The Science Behind the Protocol

- What do vision, color, and coral have in common?
 - ◆ A bleached coral has living tissue but appears white
 - ◆ What you see is **not** what you get
 - ◆ When the coral looks white **90%** of the symbiotic algae is already gone
- How do you measure the loss before the coral is completely white?
 - ◆ Correlate color intensity to the concentration of the symbionts

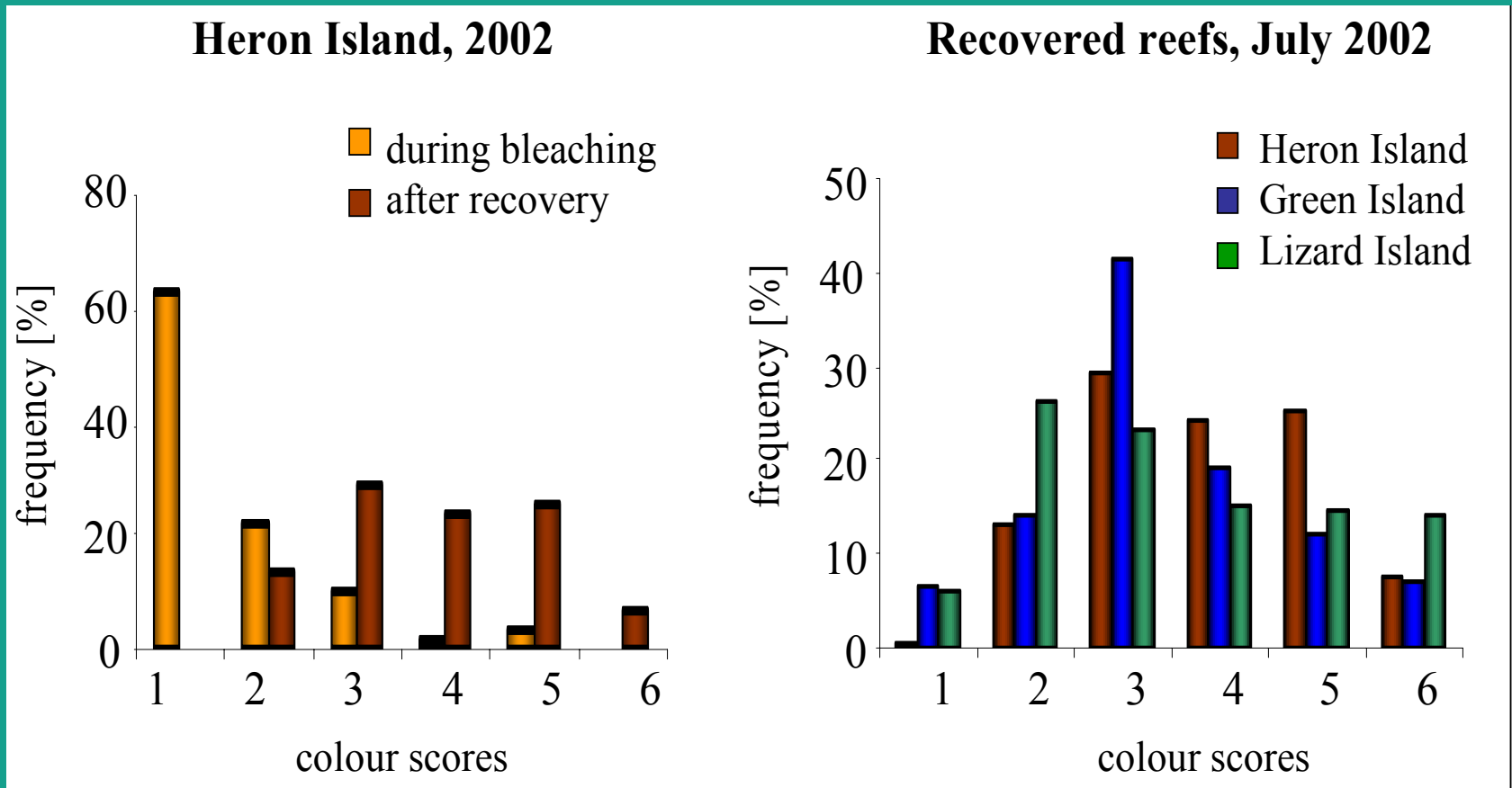
The Science Behind the Protocol



Color **intensity**, not **hue**, correlates with the level of bleaching

The **lighter** the coral the more **stressed** it is and the **lower** its score on the chart.

The Science Behind the Protocol



Tools: CoralWatch Diver Activity Kit

Includes: Chart Data Card Info Sheet for Divers

Project AWARE CoralWatch Data Sheet

Group name: _____ Your name: _____

Email address: _____

Participation field: dive center / scientist / environmental / school or university / tourist

Country of reef: _____ Reef name: _____

GPS if possible: _____

Date of survey: ____/____/____ Time collected: (e.14:00 or 2pm) _____

Weather: sunny / cloudy / raining Your activity: snorkeling / diving

Sea temperature: _____ °C

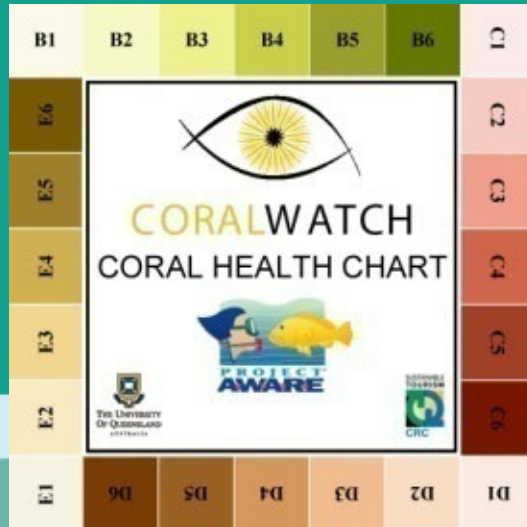
Coral Number	Color Code		Coral Type	
	Light	Dark	Brain	Other
1	C	C	S	S
2	C	C	S	S
3	C	C	S	S
4	C	C	S	S
5	C	C	S	S
6	C	C	S	S
7	C	C	S	S
8	C	C	S	S
9	C	C	S	S
10	C	C	S	S
11	C	C	S	S
12	C	C	S	S
13	C	C	S	S
14	C	C	S	S
15	C	C	S	S
16	C	C	S	S
17	C	C	S	S
18	C	C	S	S
19	C	C	S	S
20	C	C	S	S

Any other relevant information, e.g. average dive depth, coral species, pollution, long term weather such as drought, flood, heatwave.

Any comments or inquiries.

Please use one of the following options to enter your data:
Visit www.projectaware.org
Fax: +1 348 287 1221
Email: information@projectaware.org

Thank you very much for your participation! You have now contributed valuable information that will help scientists understand coral bleaching on a global scale. Check our website for survey results and global bleaching trends.



Get Involved, Take Action & Monitor Coral Reefs the Easy Way!

According to the World Resources Institute nearly 60% of the world's coral reefs are threatened by human activity. It is estimated that 30% of all coral reefs are already dead or severely damaged. Coral reefs require urgent attention if they are to be enjoyed by future generations.

Get involved in CoralWatch, in partnership with Project AWARE Foundation, and make a difference for our rainforests of the sea.

What is CoralWatch?
CoralWatch is a simple, noninvasive method for the monitoring of coral bleaching, and assessment of coral health. The Coral Health Chart is a series of colours, with variation in brightness representing different stages of bleaching and recovery.

What is coral bleaching?
Coral bleaching is the whitening of coral and is due to a loss of the symbiotic dinoflagellates (algae) living within the tissue of the coral. In a healthy coral the algae supplies the coral with energy. During a bleaching event the brownish algae disappears from the tissue of the corals leading to a colour change. Elevated water temperatures due to global warming are noted as a major cause of mass bleaching events.

How does the Chart work?
Each colour square corresponds to a concentration of symbionts contained in the coral tissue. The concentration of symbionts is directly linked to the health of the coral. All you have to do is match the colour of the coral with one of the colours in the Chart. You then record the matching colour codes, along with coral type (species if possible) on the website data sheet (www.coralwatch.org).

Why?
We need your help to monitor areas that are regularly visited by divers. By assessing a dive site over a period of months and years scientists at the University of Queensland, Australia, will use this information to answer questions like: Do reefs bleach during every El Nino event? How long does it take for a reef to recover from bleaching? Does the health of the reef get worse over a number of bleaching events?

What happens to my results?
Once your data is submitted a graph is produced that represents the overall health of your monitored dive site. All submitted data will be analysed and made available on www.coralwatch.org. With your help, data will be available for different regions of the world. This will make it possible to compare the condition of many different reefs at any one point in time, as well as the condition of a single reef over time.

How do I get involved?
Choose your site and prepare your slate (see example). Make a note of the date of your monitoring, the water temperature, the depth, the name of the reef and location. Mark on your slate anything you think might be important like rubbish, visibility, dynamic fishing activity etc.

WRITE DOWN:

1. date and time
2. location
3. water temperature
4. depth
5. weather conditions

www.projectaware.org

Project AWARE Foundation is the dive industry's leading nonprofit environmental organization.

© Project AWARE Foundation 2006

Tools: Reef Education Package

Includes:


30 Charts
A Guide to Using the Coral Health Charts
Virtual Reef & Lab
Virtual Transect
Poster
Data entry spreadsheets
Sample slate



Visit www.coralwatch.org to order

Tools: Equipment

● Slate and flashlight



Coral no	Color CODE		CORAL TYPE			
	Lightest	Darkest	Branching	Boulder	Plate	Soft
1						
2						
3						
4						
5						

08/12/06 - 9.30am
Similan Islands - Richelieu Rocks
Water - 24 degrees
Depth - 14m
Clauy

example of prepared underwater slate

WRITE DOWN:

1. date and time
2. location
3. water temperature
4. depth
5. weather conditions

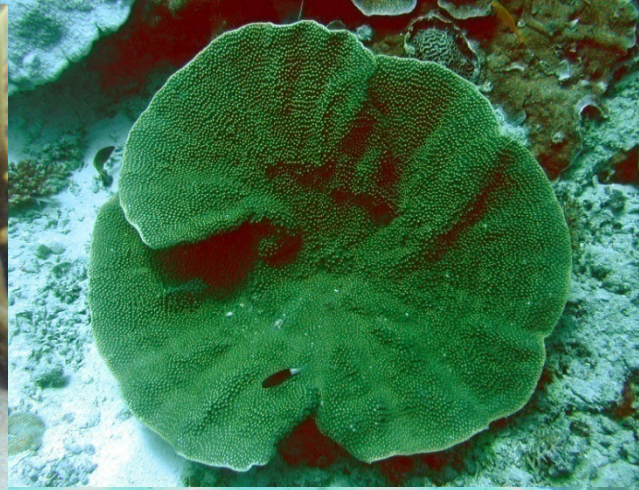


Which corals to monitor

Branching



Plate



Boulder



Soft



How to monitor



Transect

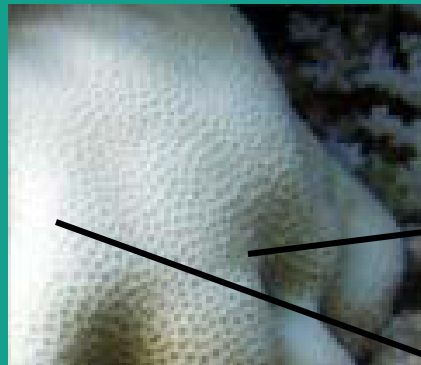


Random



Same corals

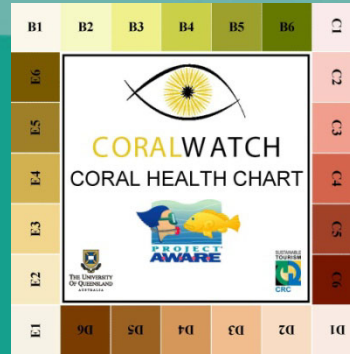
Match the color intensity



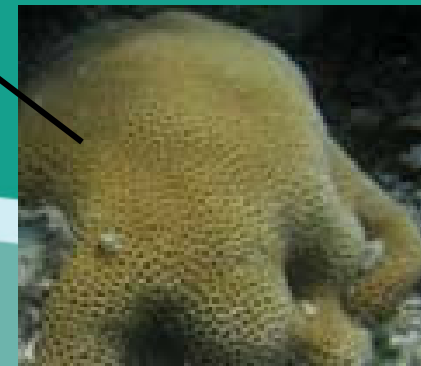
	B1	B2	B3	B4	B5	B6	C1
	E6						C2
	E5						C3
	E4						C4
	E3						C5
	E2						C6
	E1						D6

Source: CoralWatch Reef Education Package

Record Data



Coral Number	Colour Code				Coral Type			
	L=Lightest		D=Darkest		Br=Branching	Bo=Boulder	Pl=Plate	So=Soft
1	L: E5	D: E6	Br	Bo	Pl	So		
2	L: E1	D: E2	Br	Bo	Pl	So		
3	L: B5	D: B6	Br	Bo	Pl	So		
4	L: B1	D: B3	Br	Bo	Pl	So		



Data Reporting

Project AWARE CoralWatch Data Sheet

Group name: _____ Your name: _____

Email address: _____

Participation field: dive centre / scientist / environmental / school or university / tourist

Country of reef: _____ Reef name: _____

GPS if possible: _____

Date of survey: ____/____/____ Time collected: (ie. 14:00 or 2pm) _____

Weather: sunny / cloudy / raining Your activity: reef walking / snorkeling / diving

Sea temperature: _____ °C

Coral Number	Colour Code		Coral Type		
	L=Lightest	D=Darkest	Br=Branching	Bo=Boulder	P=Plate
example	L: D2	D: E5	Br	Bo	P S
1	L: D:	D: E:	Br	Bo	P S
2	L: D:	D: E:	Br	Bo	P S
3	L: D:	D: E:	Br	Bo	P S
4	L: D:	D: E:	Br	Bo	P S
5	L: D:	D: E:	Br	Bo	P S
6	L: D:	D: E:	Br	Bo	P S
7	L: D:	D: E:	Br	Bo	P S
8	L: D:	D: E:	Br	Bo	P S
9	L: D:	D: E:	Br	Bo	P S
10	L: D:	D: E:	Br	Bo	P S
11	L: D:	D: E:	Br	Bo	P S
12	L: D:	D: E:	Br	Bo	P S
13	L: D:	D: E:	Br	Bo	P S
14	L: D:	D: E:	Br	Bo	P S
15	L: D:	D: E:	Br	Bo	P S
16	L: D:	D: E:	Br	Bo	P S
17	L: D:	D: E:	Br	Bo	P S
18	L: D:	D: E:	Br	Bo	P S
19	L: D:	D: E:	Br	Bo	P S
20	L: D:	D: E:	Br	Bo	P S

Any other relevant information, e.g. average diving depth, species of coral, pollution, long term weather such as drought, flood, heat-wave.

Any comments or enquiries.

Please use one of the following options to enter your data:

Visit www.projectaware.org

Fax: +61 2 3454 2593

E-mail: info@projectaware.org.au

Thank you very much for your participation! You have now contributed valuable information that will help scientists understand coral bleaching on a global scale. Check our website for survey results and global bleaching trends.

Coral Type Terminology



Br = Branching



Bo = Boulder



Pl = Plate



So = Soft

Coral type terminology has been refined to better represent the coral types present on reefs, as per feedback received from marine educators. "Staghorn" coral type changes to "branching" and "brain" changes to "boulder". All coral types will now have a two letter code, for example soft will be represented by "so". During the change of period you may need to use staghorn and branching interchangeably, and likewise for brain and boulder – please bear with us during this transition period.

Online Mail Fax

Coral Number	Colour Code		Coral Type			
	L=Lightest	D=Darkest	BR=Branching/Staghorn	BO=Boulder/Brain	PL=Plate	SO=Soft
1	L: B 1	D:	<input type="checkbox"/> BR	<input type="checkbox"/> BO	<input type="checkbox"/> PL	<input type="checkbox"/> SO
2	L: B 1	D:	<input type="checkbox"/> BR	<input type="checkbox"/> BO	<input type="checkbox"/> PL	<input type="checkbox"/> SO
3	L: B 1	D:	<input type="checkbox"/> BR	<input type="checkbox"/> BO	<input type="checkbox"/> PL	<input type="checkbox"/> SO
4	L: B 1	D:	<input type="checkbox"/> BR	<input type="checkbox"/> BO	<input type="checkbox"/> PL	<input type="checkbox"/> SO
5	L: B 1	D:	<input type="checkbox"/> BR	<input type="checkbox"/> BO	<input type="checkbox"/> PL	<input type="checkbox"/> SO

Any other relevant information i.e. species of coral, pollution, long term weather conditions such as drought, flood, heatwave, average depth if diving

Submit

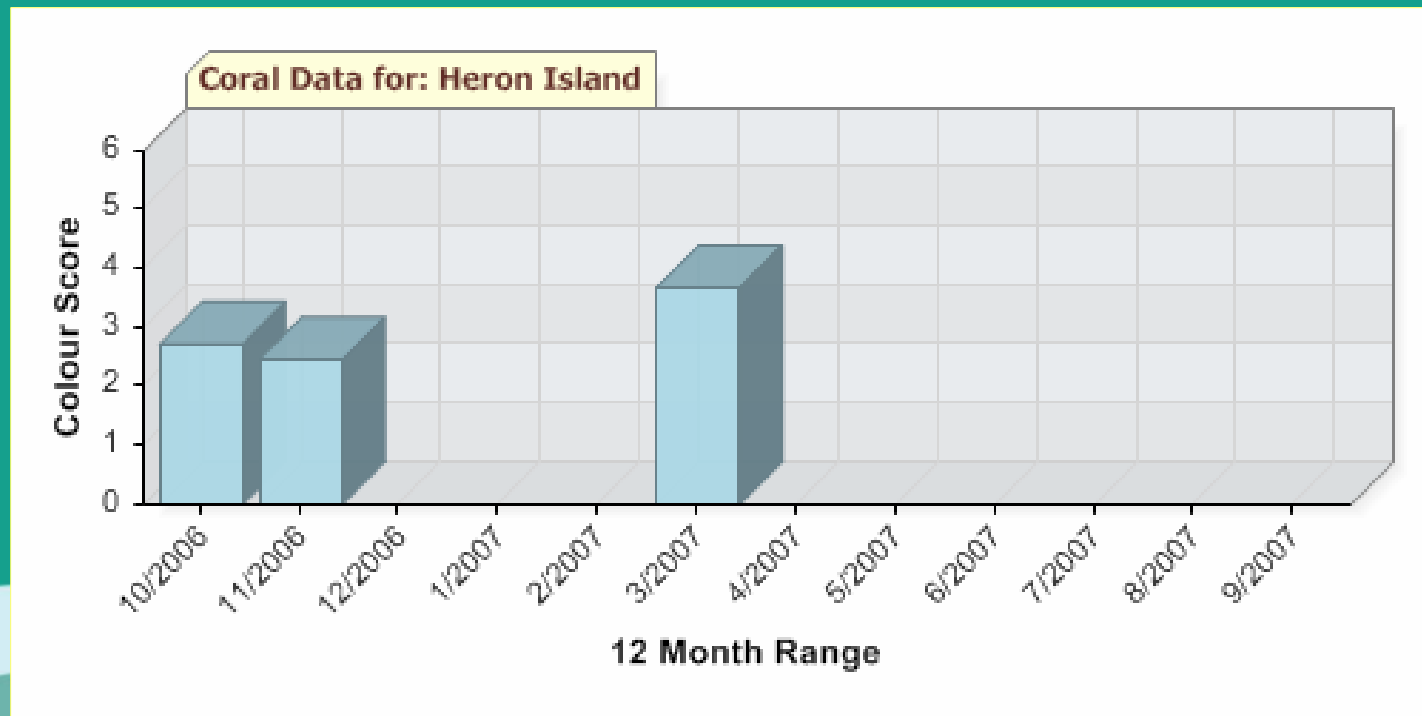
Data Reporting

- **Do it yourself ☺**
- **Involve the divers**
 - ◆ **Satisfy the need for meaningful activity and participation**
 - ◆ **Instant gratification**
- **Involve dedicated volunteers**
 - ◆ **Organization, monitoring and reporting**
- **Designate your staff**



What happens to reported data?

- Future and current data analysis by scientists
- Track the health of your dive sites and compare with other sites



What do you do?

- Brief participants on CoralWatch methodology
- Stress Project AWARE philosophy
 - ◆ 10 Ways
- Take them diving
- Make sure the data get's reported
- Do it again!

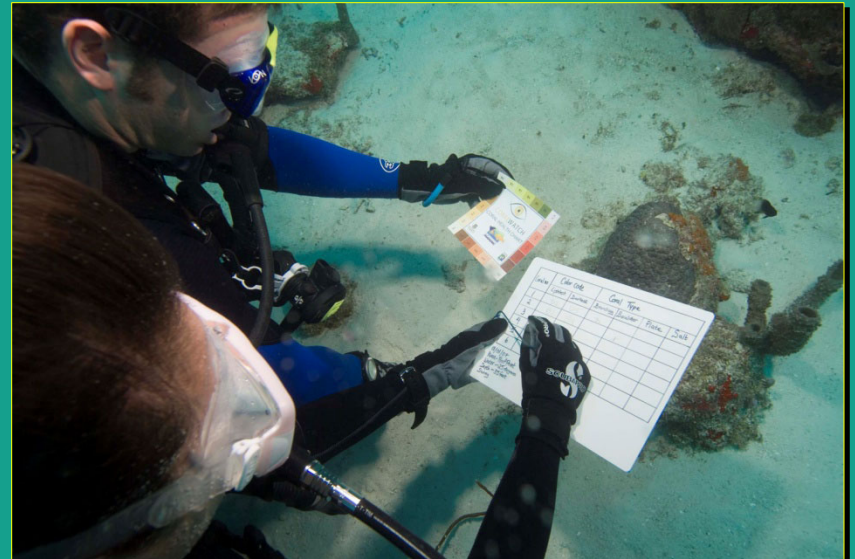


What do the divers do?


Dive



Record observations



Report data


CORALWATCH
Coral Bleaching Survey

Thanks for participating in this survey, please complete the following information before you enter your data for each sample.

Group name: Your Name:

Your email address:

Participation Field:

Country:

Reef name: Other:

GPS Coordinates: Deg Min Sec -Latitude
 -Longitude

What's next?



- **Have a monitoring plan**
- **Communicate and train your staff**
- **Use CoralWatch**
 - ◆ **Integrate with your regular activities**
 - ◆ **With a dedicated group of volunteers**
 - ◆ **Combine with other courses**
 - ◆ **Community outreach**
- **Stay in touch with us**



What's next?

◆ Where?

- ◆ Select your sites
 - Local/Travel
 - Access
 - Coral diversity

◆ How?

- ◆ Decide on the methodology
 - Random
 - Transact
 - Same Corals
- ◆ Snorkel/Scuba
- ◆ Staff, volunteers, students and kids

◆ How often?

- ◆ Choose the frequency
 - Daily
 - Bi-weekly
 - Weekly
 - Bi-monthly
 - Monthly
 - After receiving a bleaching alert


◆ Who?

- ◆ Organizes, leads, and reports the data
- ◆ Staff and/or Volunteer

What's next?

- **Train those involved**
 - ◆ Share the link to this presentation
- **Communicate with your current and future customers, volunteers students**
 - ◆ Email template
 - ◆ Website banner
 - ◆ Poster
 - ◆ Press release
- **Talk to us!**
 - ◆ Ask questions and share your success stories


Make your dives **COUNT**
Monitor Coral Reefs



Take *action* to monitor local coral reefs. Your data helps scientists protect reefs from drastic decline. Ask *here* about getting involved.

CONTACT:
MONITORING SITE:
DETAILS:

Conserving underwater environments through education, advocacy and action.
© Project AWARE Foundation, Inc. 2007 Product #0206



www.projectaware.org

Will I Really be Helpful?

- Your data will feed into international monitoring efforts such as
 - ◆ Global Coral Reef Monitoring Network
 - ◆ ReefBase
 - ◆ Other Programs

TROPICAL RESEARCH LABORATORY
SUMMERLAND KEY, FLORIDA

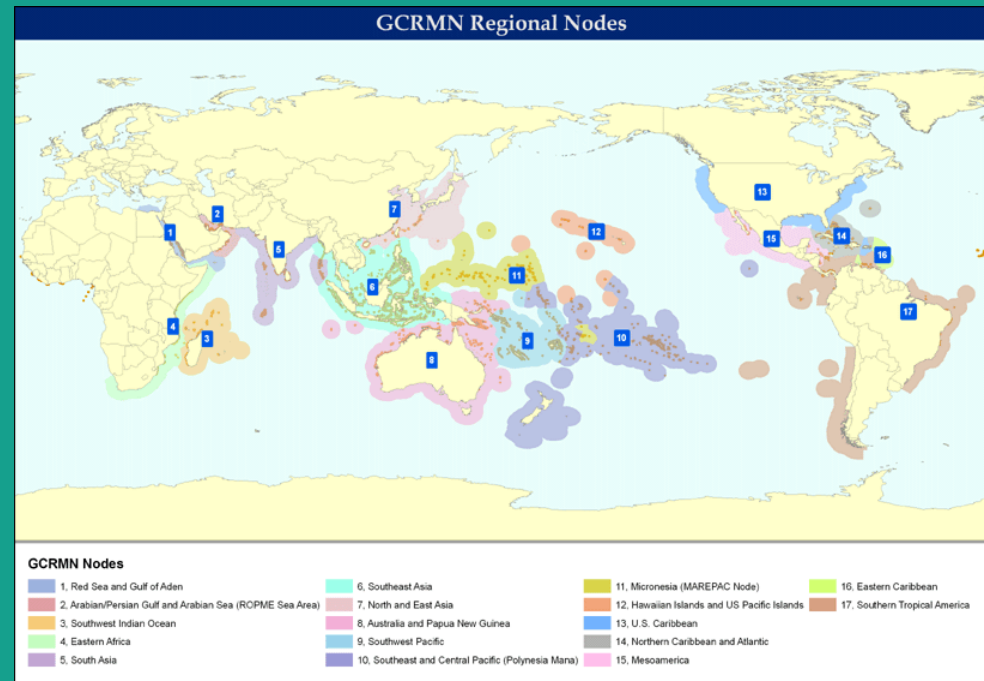
MOTE
MARINE LABORATORY

HOME FACILITIES MARINE OPS RESEARCH EDUCATION GENERAL INFO

FLORIDA KEYS CORAL BLEACHING EARLY WARNING NETWORK (BLEACHWATCH)

Coral bleaching, which is the corals' loss of their symbiotic algae called zooxanthellae, is a natural event that occurs to some extent every year in the Florida Keys National Marine Sanctuary (FKNMS). While records show that coral bleaching events have been occurring for many years in the Florida Keys,

"Current Conditions Report" provides a summary of NOAA's coral bleaching early warning products and reports from trained Florida Keys observers.



ReefBase :: A Global Information System For Coral Reefs

Log In | Register | Search | Contact Us



Take Home Messages

Coral reefs are in danger of **disappearing** from temperature induced bleaching in the next **30-50 years**

Take Home Messages

You can **help!**

Understand and **help minimize**
local stressors

Reduce your carbon footprint

Educate others about the global
warming and coral bleaching
connection

Participate in conservation
activities

Take Home Messages

CoralWatch is a **simple**,
noninvasive **tool for monitoring**
coral health

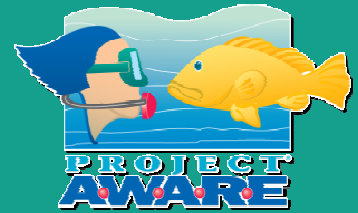
Volunteer **divers** and **snorkelers**
evaluate, record and **report**
information collected during a dive

Take Home Messages

The effort **needs** large amounts of **data now** to inform conservation

By **organizing** and **participating** in **monitoring activities** you **contribute** to an international effort and **educate others** about threats to coral reefs

Thank you for watching!



www.coralwatch.org

www.projectaware.org

Click [here](#) to tell us what you think