



CSI on Coral Reefs

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One Ocean Programme

26 November 2008





adequacy
connectivity
representation
planning
resilience



National and Regional Networks
of Marine Protected Areas:
A Review of Progress





Deep-sea biodiversity and ecosystems



A scoping report
on their socio-economy, management and governance





Knowledgebase for Lessons Learned and Best Practices in the Management of Coral Reefs

www.reefbase.org/gefl

or

www.icran.org

WDPA Marine

The screenshot shows the homepage of the World Database on Marine Protected Areas. At the top left is a globe icon. The main header reads "World Database On Marine Protected Areas" with the subtitle "incorporating the UN List of Protected Areas". To the right are login fields for "Username" and "Password", a "Register" link, and a "Log In" button. Below the header is a navigation menu with "Home", "Maps", "Search", "Download", and "Contribute". A large satellite-style map of the world is displayed, with a "CONSERVATION COMMISSION" logo in the bottom right corner. Below the map is a search bar labeled "Quick Protected Area Search:" with a placeholder "Start typing then select from list" and a "Search" button. The main content area is divided into six columns: "Welcome" (describing the database's purpose), "Tools" (linking to RALUCIAPA and FIRMS), "Maps" (linking to 2D Maps), "Search" (linking to advanced search), and "Contribute" (linking to registration). The footer contains "Terms of Use | Site Map | FAQ | Contact | Feedback", a note about software donors (ESRI and Safe Software), and logos for UNEP, WCMC, IUCN, and WCPA.

World Database On **Marine** Protected Areas
incorporating the UN List of Protected Areas

Username
Password
[Register](#)

[Home](#) [Maps](#) [Search](#) [Download](#) [Contribute](#)

Quick Protected Area Search:

Welcome


The World Database on Protected Areas is a foundation dataset for conservation decision making. It contains crucial information from national governments, non-governmental organizations, academic institutions, international biodiversity convention secretariats and many others. It is used for ecological gap analysis, environmental impact analysis and is increasingly used for private sector decision-making. For more information [click here](#).

Tools

[Rapid Assessment Of Land Use Change In and Around Protected Areas \(RALUCIAPA\)](#)
[The Fire Information for Resource Management System \(FIRMS\)](#)

Maps

Explore and visualize marine protected areas through our map viewers.


[2D Maps](#)

Search

Search for marine protected areas by many criteria with our [advanced search tool](#).

Contribute

[Register](#) your interest in becoming a WDPA Data Provider.
As a WDPA data provider you can utilise our online data mangement tools.

The WDPA Supporters The WDPA is powered by software donated by [ESRI](#) and [Safe Software](#)

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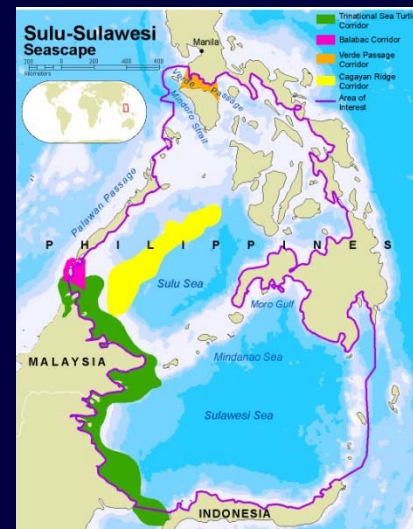
UNEP WCMC IUCN WCPA
WORLD COMMISSION ON PROTECTED AREAS

www.wdpa-marine.org

World Database of Protected Areas: What is it?

◆ Boundary and attribute data on protected areas

- Consists of key fields
 - ◆ Name
 - ◆ Designation
 - ◆ Date of establishment
 - ◆ IUCN Category
 - ◆ Boundary
 - ◆ Other interesting stuff (governance, etc.)
- Expanding to include zonation, links with species, habitats, etc



www.wdpa-marine.org

Coral Reefs at UNEP-WCMC

Coordinating Unit of the International Coral Reef Action Network (ICRAN)

UNEP Coral Reef Unit (CRU)

Support to the Secretariat of the International Coral Reef Initiative (ICRI)

CSI on Coral Reefs

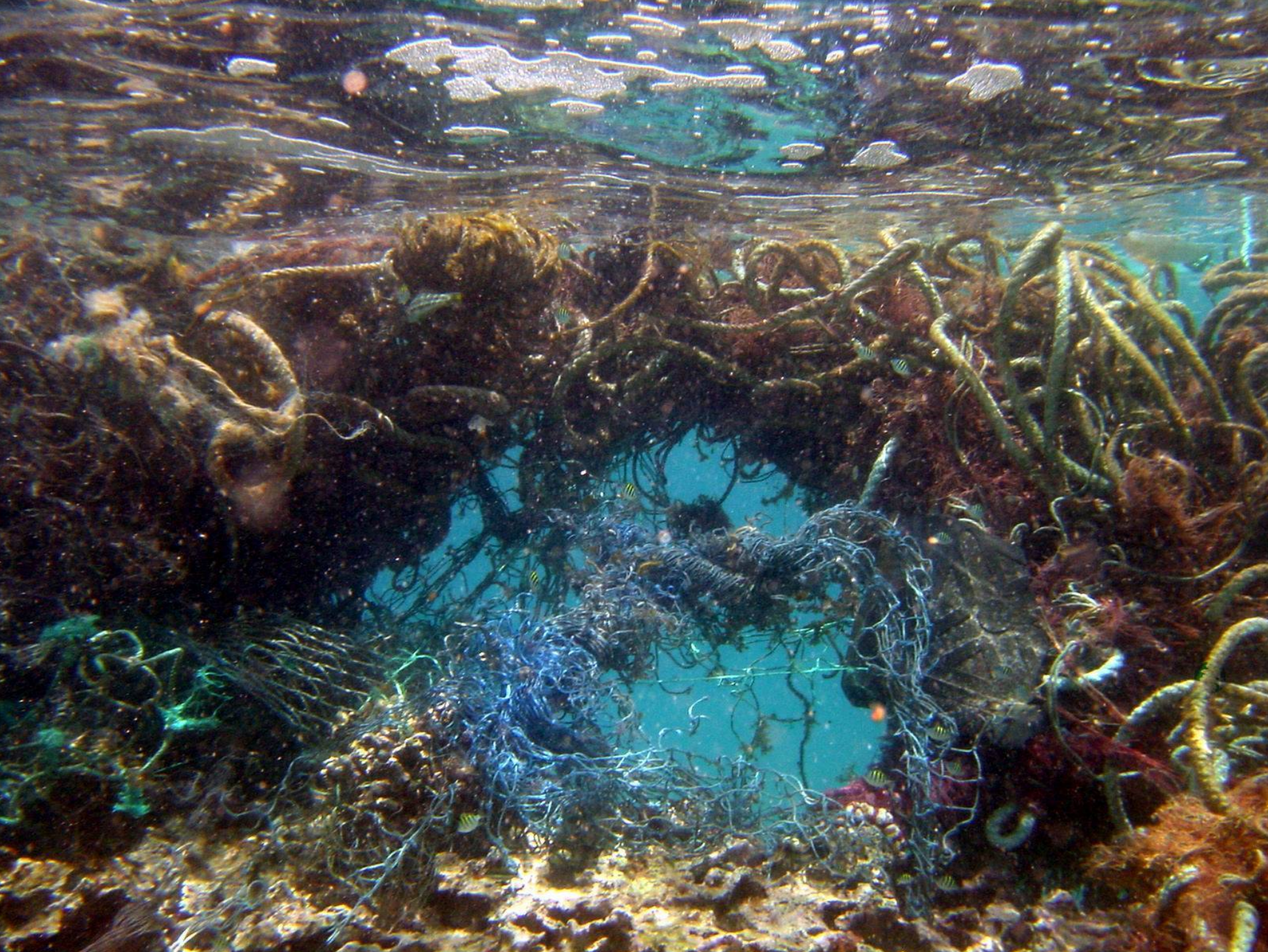
International Program to Assist Natural
Resource Trustees and Enforcement

CRIME SCENE DO NOT CROSS

CRIME SCENE DO NOT CROSS

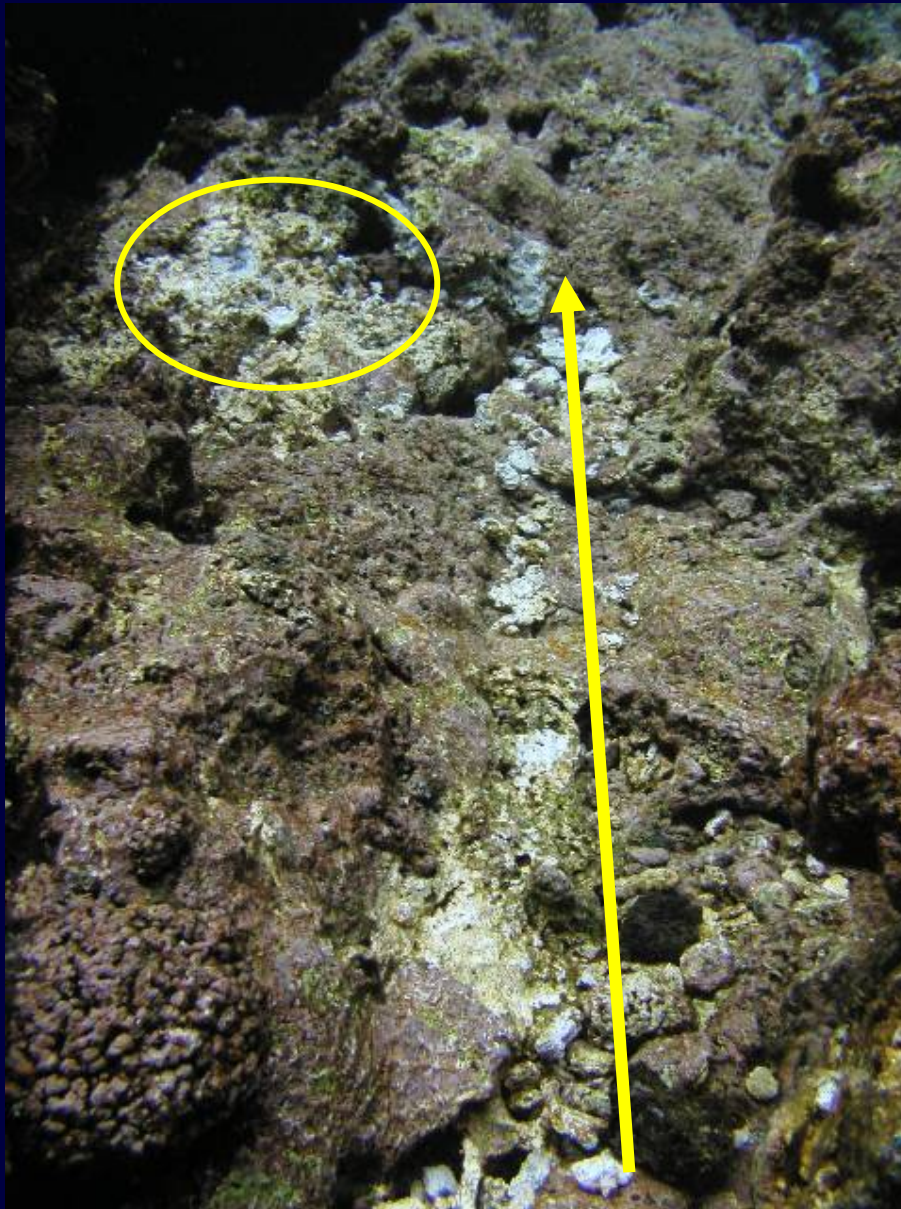
Dave Gulko, Patricia Ramirez,
Angelique Brathwaite

ICRI Committee on Coral Reef
Enforcement & Investigation



In today's world we have become painfully aware that often the damage that we document to natural resources under our care has a direct relationship to actions of individuals who can be held accountable.





For A Short-Term
Human Impact Event
On Coral Reefs - How
Do We Determine
Causality &
Responsibility?

- Landing Scrape
from Kayak
- Foot Damage
from Entry/Exit

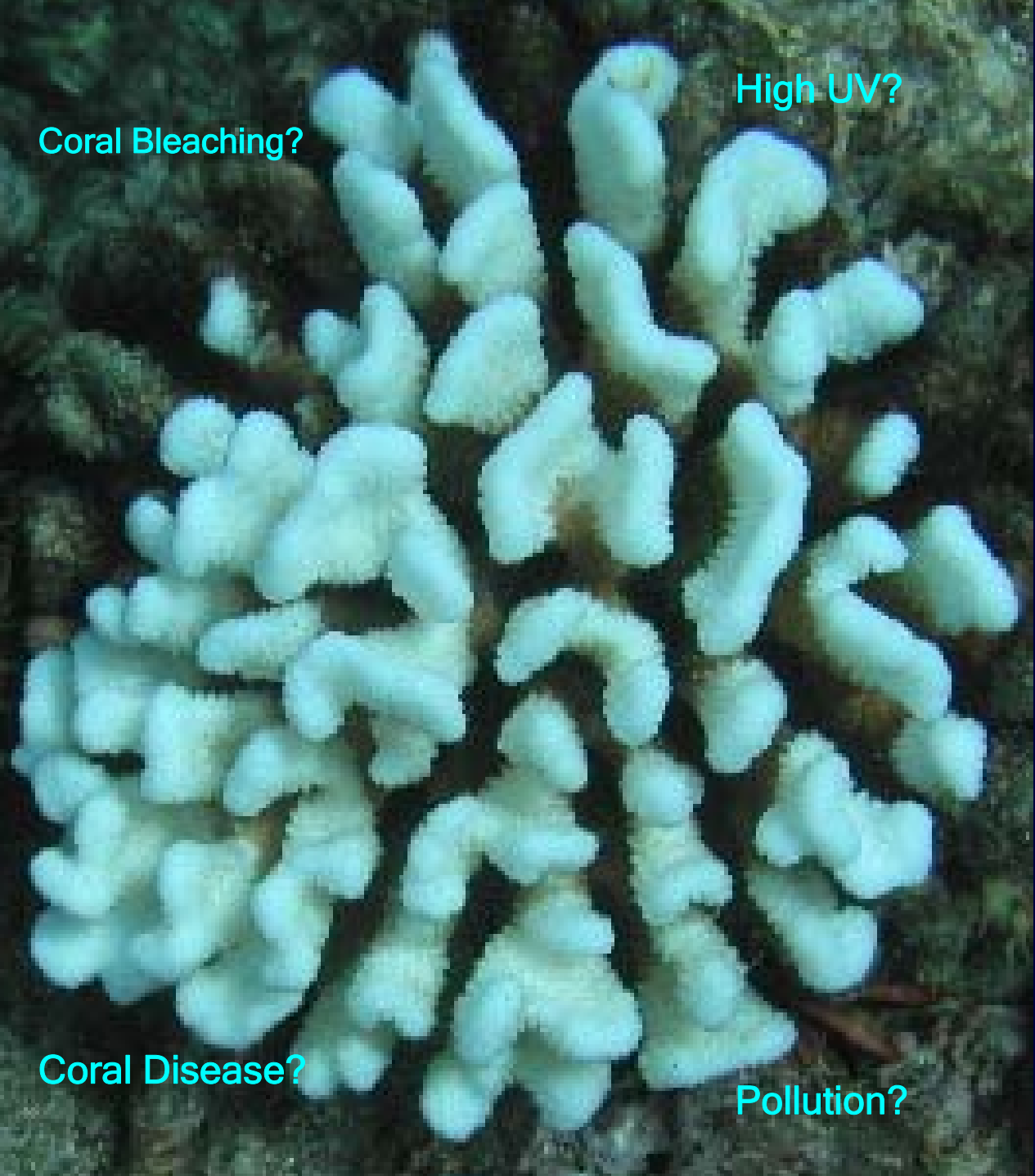
High UV?

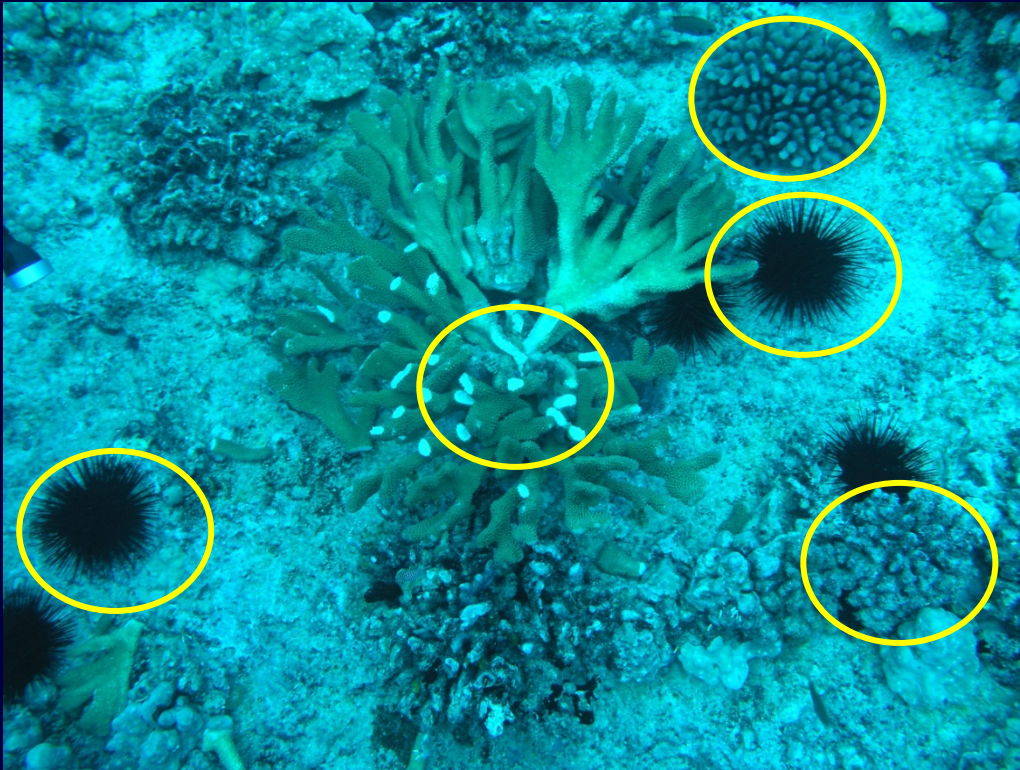
Coral Bleaching?

How do we differentiate between destructive human impacts, global climate change, and natural predation?

Coral Disease?

Pollution?





- Single break point, coral colony alive, but missing inhabitants, skeleton bright white.

- Healthy and long-dead, CCA-covered colonies suggest a robust healthy habitat.

- Unusual diurnal concentration of urchins help to establish time frame.

So why do in-water investigation?

Together, these help to refine both the cause and time window of the injury.

The Problem:

- 1) For a wide variety of coral reef impact incidents, the people most likely to respond have no formal training or tools for conducting legally-defensible investigations
- 2) There are no recognized standards for conducting such investigations
- 3) Most investigations, by necessity, overlap trustee agency needs for mitigation, restoration, mediation, prosecution and compliance management



Working Sub-Group

- ◆ Coral Reef Resource Managers
- ◆ Ex-homicide Detective & CSI Advisor
- ◆ Wildlife Forensic Laboratory
- ◆ ERA Specialists
- ◆ Coral Reef Restoration Specialists
- ◆ Coral Reef Enforcement Specialists
- ◆ Coral Reef Ecotoxicologists



Use of Investigations to Maximize

- Negotiation
- Mitigation
- Mediation
- Litigation
- Prosecution
- Restoration
- Identification of Responsible Parties (RPs)

The Regional Workshop Approach:

- Experienced CR CSI Instructors
- Asst CR CSI Instructors from Region
- Regional Participants: Multi-country, Multi-agency, Multi-discipline



IMPACTS ON CORAL REEFS



Vessel Groundings



Anchor Damage



Sediment Events



Illegal Fishing



Destructive Fishing



Sewage Events

A school of blue tang fish swimming in clear blue water. The fish are seen from various angles, some in the foreground and others in the background, creating a sense of depth and movement. The lighting is bright, highlighting the scales and fins of the fish.

Who Are We Talking About

- Marine Enforcement Officers
- Environmental Assessment Specialists
- Litigators
- Natural Resource Managers & Biologists
- Coral Reef Researchers
- NGP Professionals

A school of blue tang fish swimming in a dark blue tank. The fish are light blue with yellow and white stripes along their sides. They are swimming in various directions, creating a sense of movement. The background is a deep, dark blue, making the fish stand out.

What Are We Talking About

- Basic Investigation Training & Strategies
- Handling of Data as Evidence
- Providing Ecological & Resource Impact Analysis to Support Prosecution
- Classroom and field based

Basic Assumptions of CR Investigations

- ◆ Going to Court
- ◆ Limitations: Time, Scale, Resources
- ◆ Ecological Complexity
- ◆ Remoteness of Operation

Usually it's not this easy...



Basic Assumptions of CR Investigations

Two Types of Investigations:

- Cause Known, Impact Unknown (ex. Vessel Grounding)
- Cause Unknown, Impact Known (ex. Fish Kill)



How Do You Investigate Impacts on Coral Reefs?

- Research, experimentation
- Monitoring

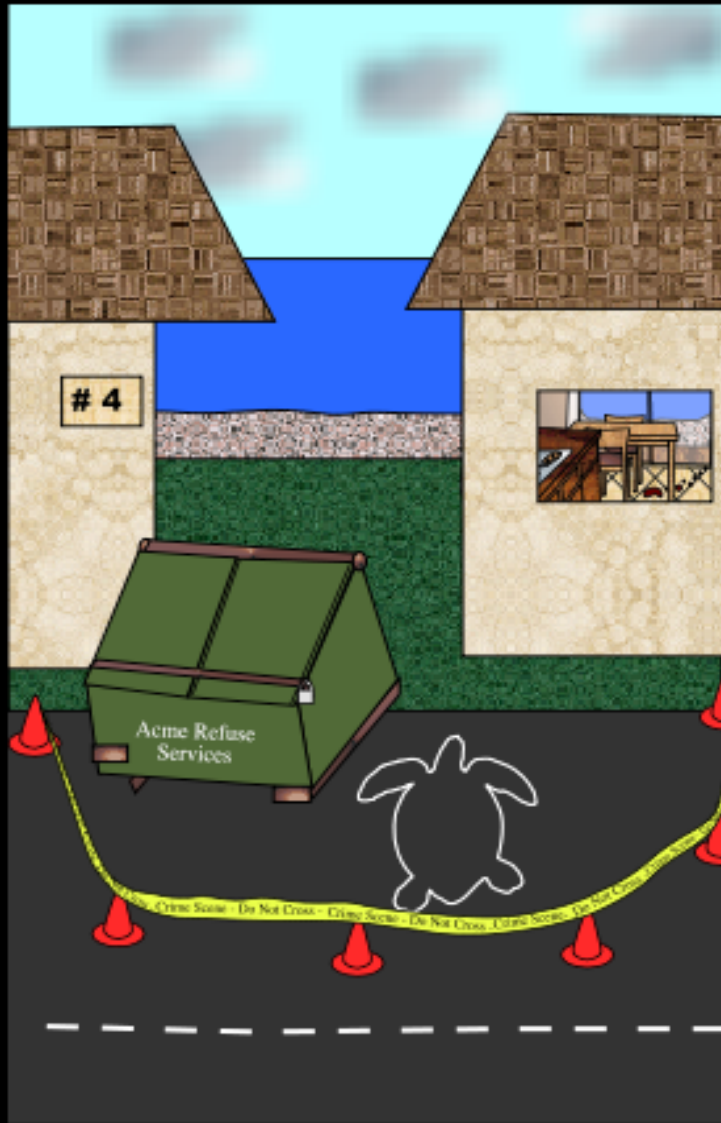
Research Approach

- ◆ Science driven by grants & publication needs.
- ◆ Strong burden on experimentation & repetitiveness.
- ◆ Management concerns not primary focus.
- ◆ Often lacks formal chain-of-custody and evidence collection.



The 'CSI' Approach

- ◆ Science driven by legal needs
- ◆ Strong burden on documentation
- ◆ Strong burden on “Chain-of-Custody”

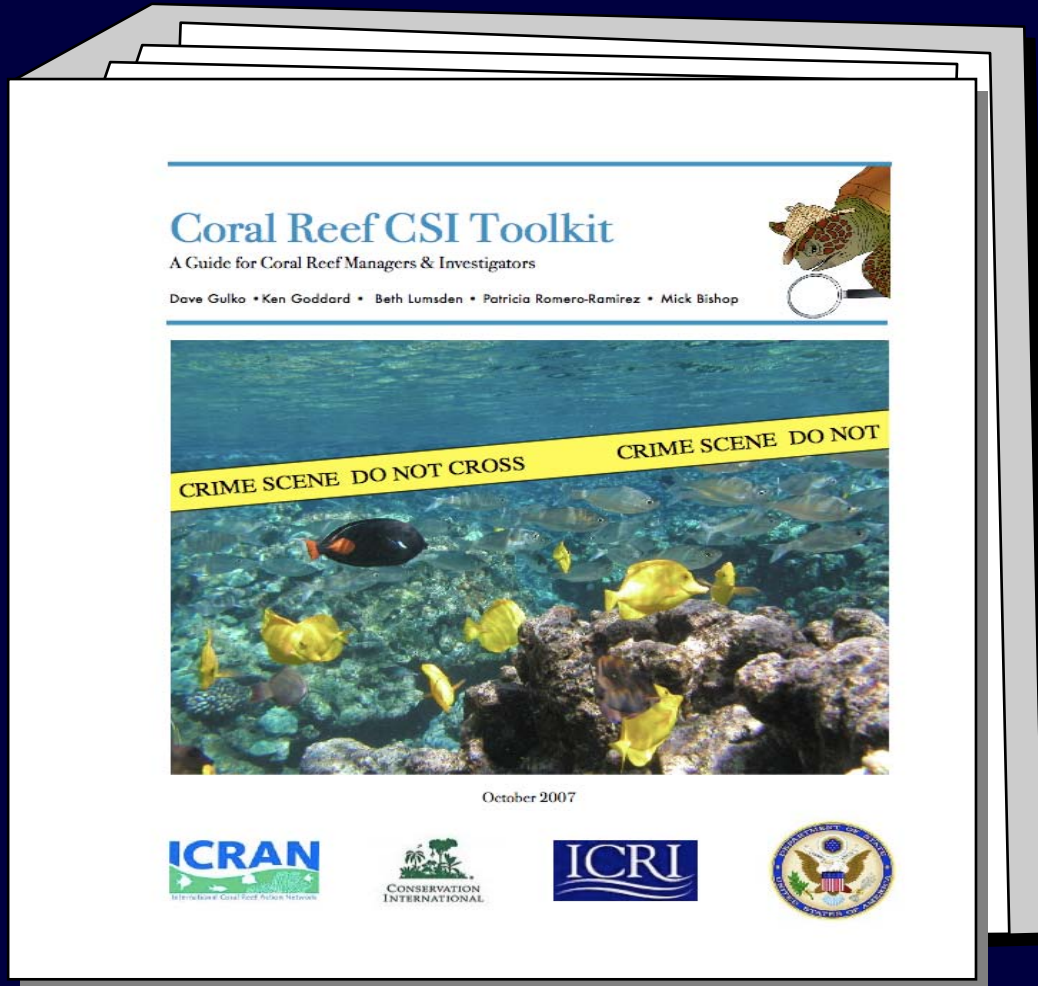


The 'CSI' Approach

- ◆ Existing International Acceptance

But how do you translate terrestrial techniques to an underwater world?

CR CSI Toolkit

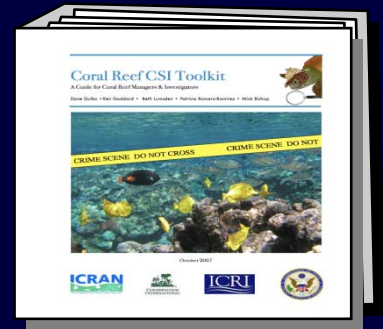


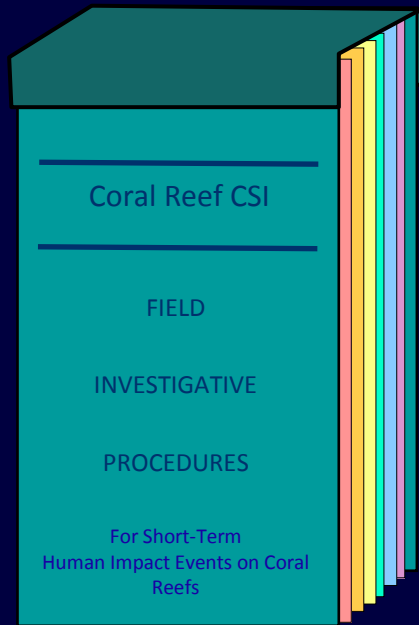
- ◆ Cookbook Approach
- ◆ High & Low Tech
- ◆ Translatable

CR CSI Toolkit

Examples and techniques for:

- ◆ Analyzing data and evidence
- ◆ Preparing materials for court
- ◆ Dealing with the media
- ◆ Determining lost ecological services and recovery rates to set mitigation and restoration goals





Field Underwater Flipbook

- ◆ Durable & Compact
- ◆ Outline Form
- ◆ Color-Coded



Reference CD



CSI Field Kit

- ◆ Most Items Can Be Self Made
- ◆ High & Low Tech
- ◆ Portable, Self-Contained

Stages of a Coral Reef CSI Field Investigation:

FIELD INVESTIGATION PHASES	PRIMARY ACTIVITIES	TIMELINE RELATIVE TO IMPACT EVENT	DAMAGE TIMELINE
<p>Initiate Investigation</p> <p>[REPORT]</p>	<ul style="list-style-type: none"> • Collect Incident Location and Other Parameters Information • Deploy Field Team 	Immediately After Impact is Reported	1 ^o Impact Damage and Peripheral
<p>The Pre-Assessment</p> <p>[RESPOND]</p>	<ul style="list-style-type: none"> • Set Event Perimeter • Set Impact Perimeter • Define Habitats & Subhabitats • Identify & Document Damage Pathways 	<p>Prior to Impact Cause Removal/Cessation</p> <p>[pending safety/field logistics concerns]</p>	<p>1^o & 2^o Impact Damage and Peripheral</p> <p>1^o Response Damage</p>
<p>The Impact Assessment</p> <p>[RETRIEVE]</p>	<ul style="list-style-type: none"> • Document Specific Damage to Habitats, Subhabitats, Key Species • Collect Physical & Other Evidence • Identify Impacts to Users 	<p>Immediately After Impact is Removed/ Ceases</p> <p>[pending safety/field logistics concerns]</p>	<p>1^o & 2^o Impact Damage and Peripheral</p> <p>1^o & 2^o Response Damage</p> <p>1^o Removal/Cessation Damage</p>
<p>The Rapid Ecological Assessment (REA)</p> <p>[REVIEW]</p>	<ul style="list-style-type: none"> • Document Biomass, Biodiversity Impacts Relative to Control Sites • Identify Ecological Functions 	<p>Post-Removal or Cessation</p> <p>[pending safety/field logistics concerns]</p>	<p>1^o & 2^o Impact Damage and Peripheral</p> <p>1^o & 2^o Response Damage</p> <p>1^o & 2^o Removal/ Cessation Damage</p>

The Pre-Assessment

RESPOND

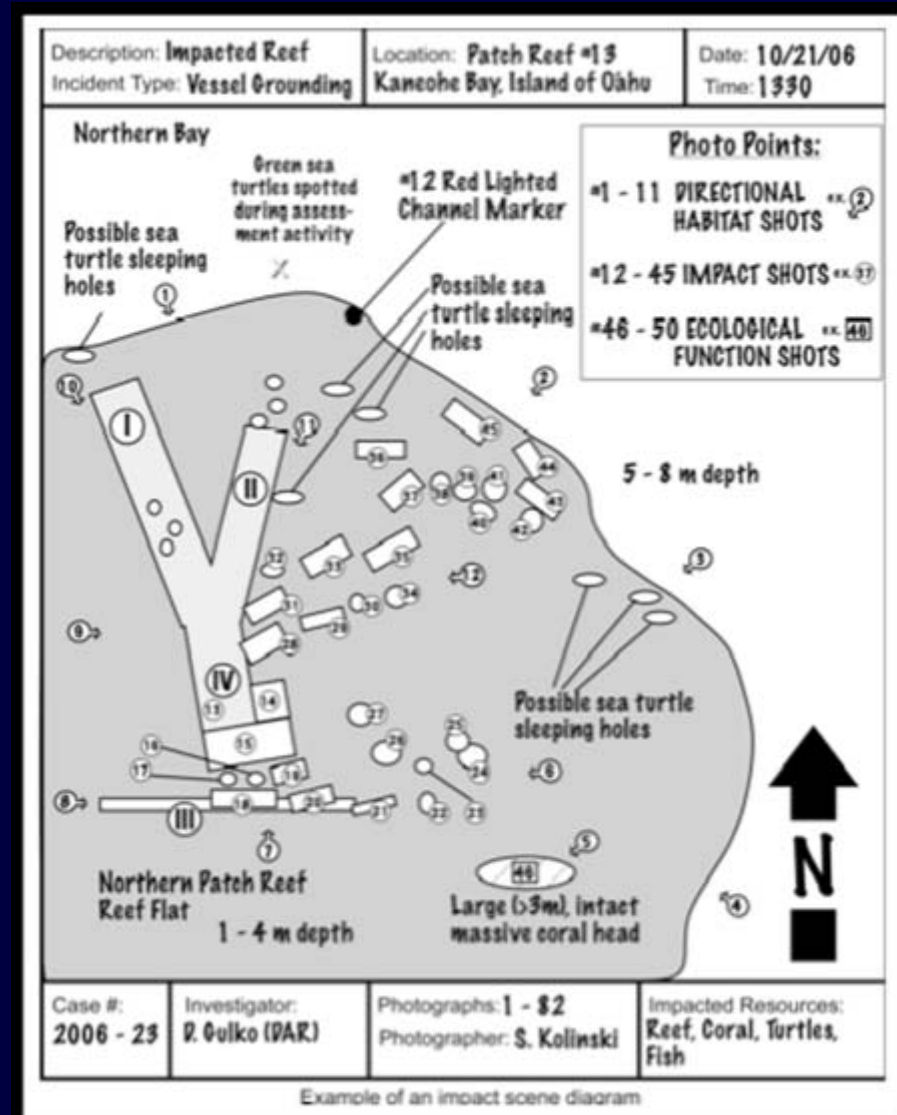
- Set Event Perimeter
- Set Impact Perimeter
- Define Habitats & Sub habitats
- Identify & Document Damage Pathways



The Impact Assessment

RETRIEVE

- Detailed Damage Measurements
- Resources at Risk
- Photo/Scene Shots
- Collect Physical Evidence



The Impact Assessment

RETRIEVE

- Document specific damage to habitats, subhabitats, & key species.
- Collect physical & other evidence.
- Identify impacts to users.



Assists in specific damage documentation and impact evidence collection

The Rapid Ecological Assessment (REA)

REVIEW

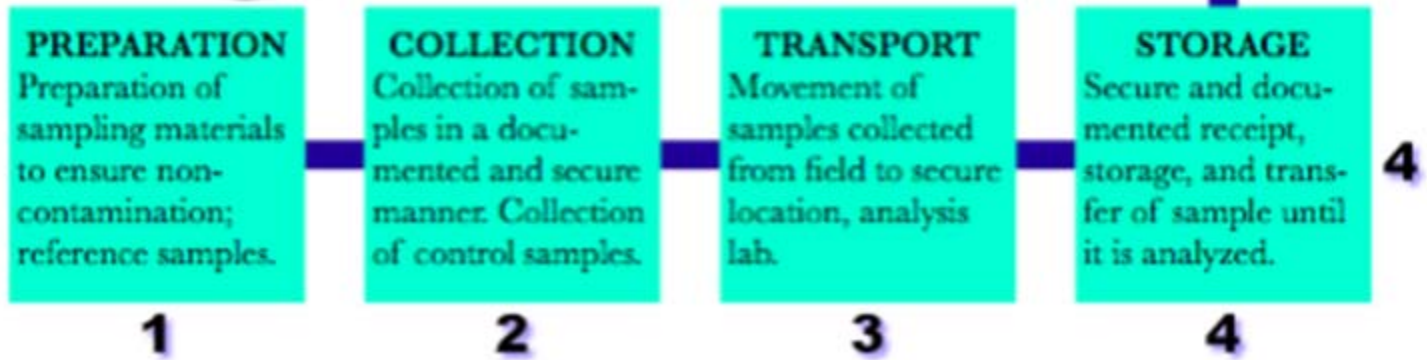
- Document biomass, biodiversity impacts relative to control or reference sites.
- Identify ecological functions.



Assists in establishing rates of recovery, quantifying loss on various levels, and determining mitigation & restoration options/values.



Chain-of-Custody Procedures Through Various Phases of an Investigation





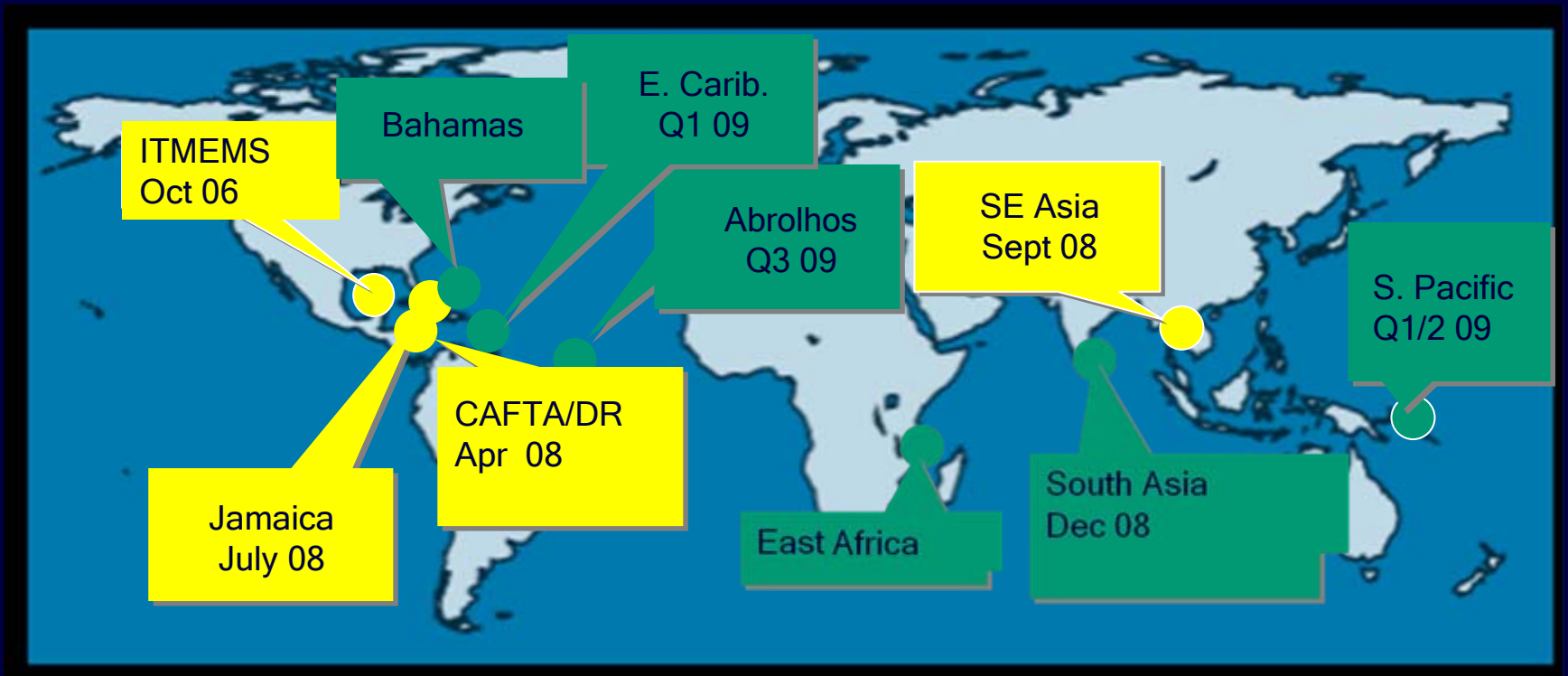
Wide Range of Applications:

- Vessel Groundings
- Destructive Fishing
- Illegal Fishing
- Illegal Trade
- Oil, Chemical, Sediment Spills
- Pollution Events
- Other Injury Events

Temperate Applications?



Field Training Workshops



S. Carib., Indonesia/Philippines, Australia, Central Pacific, Red Sea

Sample Workshop Schedule



Daily
Lectures/Demos



Injury/Crime
Scene
Investigative
Dives



Dry Field Runs



Mock Trial

Five days with maximum 18 participants

Future Directions: Illegal Marine Trade Issues?



- ◆ ICRI Working Group on Enforcement & Investigation
- ◆ Develop similar to CR CSI model
- ◆ Proposed for 2010
- ◆ In development

So How Do You Get A Field Training Workshop For Your Area?

CRIME SCENE DO NOT CROSS

CRIME SCENE DO NOT CROSS

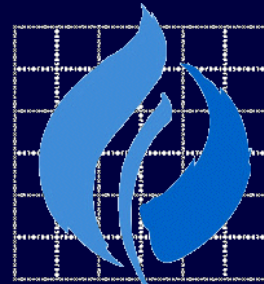
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and

Terri Young
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UNEP



WCMC

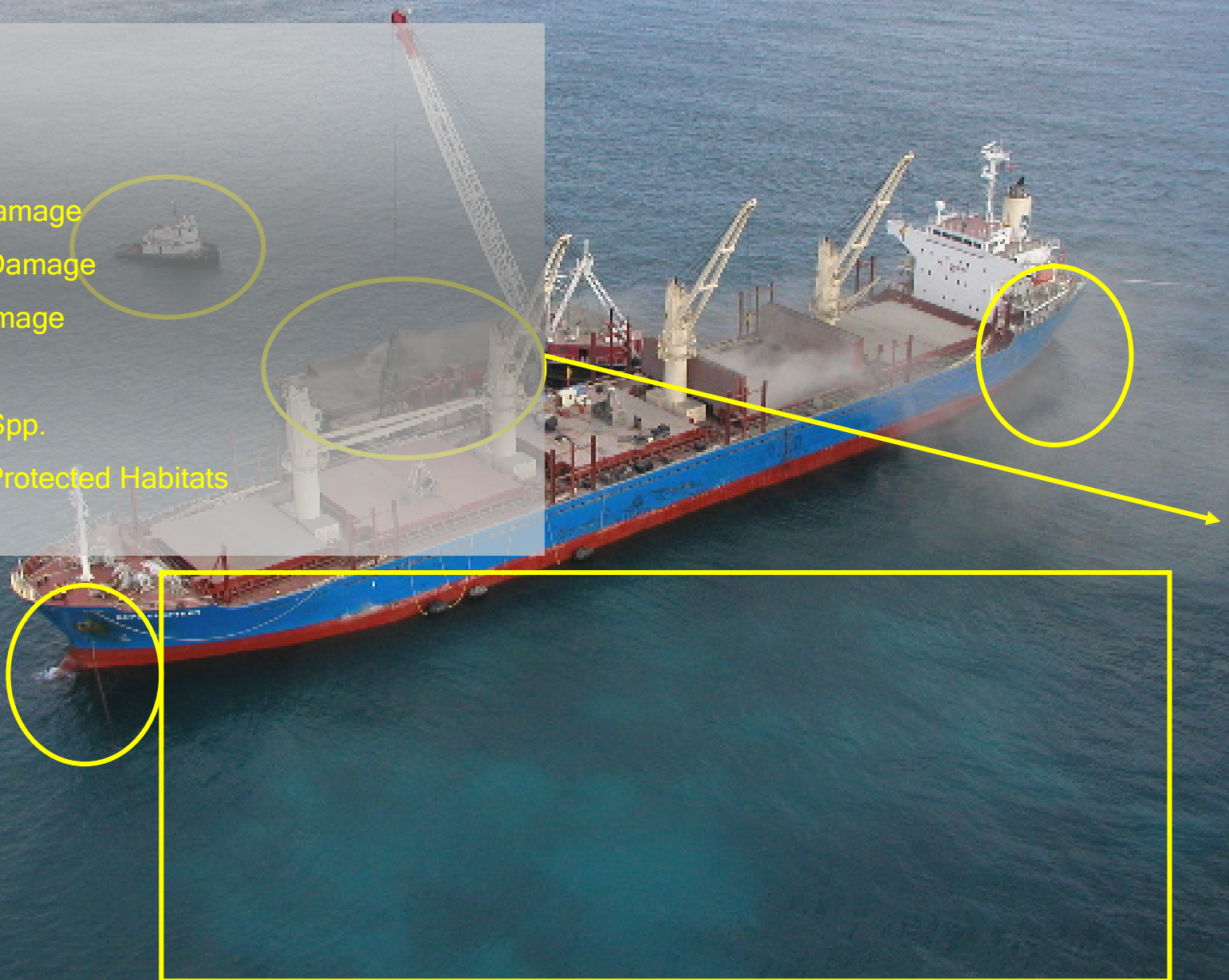
A world where biodiversity counts

www.unep-wcmc.org/oneocean

www.icran.org

Initiate Investigation

- Fuel
- Alien Spp.
- Chemicals
- Physical Damage
- Recovery Damage
- Anchor Damage
- Rare Spp.
- Protected Spp.
- Fragile or Protected Habitats

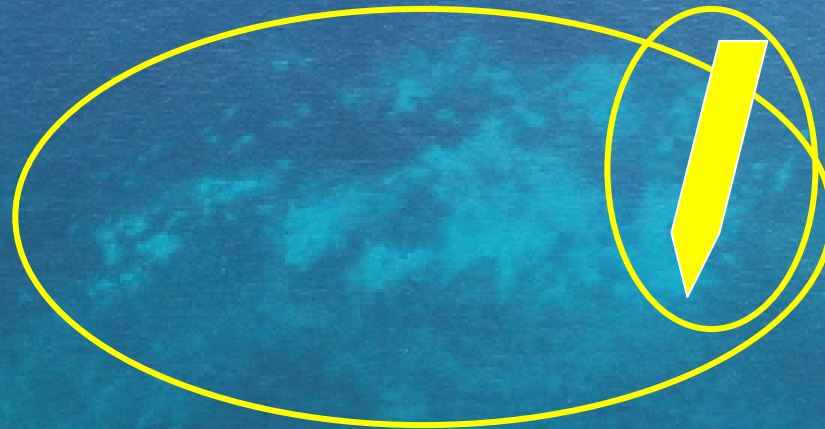


The Pre-assessment: Setting an Impact Scene Perimeter, an Event Perimeter, & Defining Habitat/Subhabitats

Deep Reef

Reef Slope

Reef Crest



Reef Flat

Reef Holes

Massive Corals

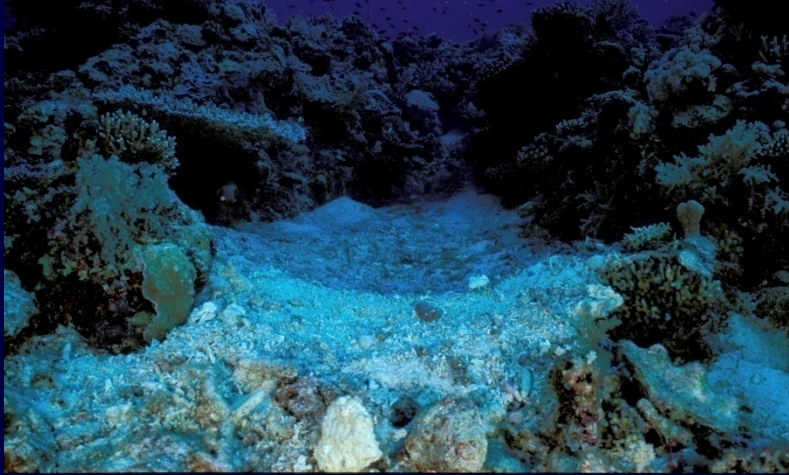
Pop-Quiz



Discarded Drift Waste



Blast Fishing



- ◆ Indo-Pacific
- ◆ Food Fish & Ornamentals

