



Coral Reef CSI

A Training Program for Coral Reef & MPA Managers, Enforcement Officers & Investigators



An Informational Booklet



November 2008

Coral Reef CSI



Setting an event perimeter around a natural resource injury scene, Dominican Republic workshop, April 2008

This informational booklet was prepared by Dave Gulko in his capacity as a coral reef and natural resource management expert, one of the developers of the Coral Reef CSI Field Training Program, and as leader of the International Coral Reef Initiative (ICRI) Committee on Coral Reef Enforcement & Investigation.

The Coral Reef CSI field training program was developed and initially run through generous support from the US Department of State (DOS) and NOAA's International Programs Office, and currently is run in various countries through continued support from US Department of State and specific host countries.

Production and printing of this booklet was supported by the United Nations Environment Programme. The UNEP Coral Reef Unit and the ICRAN Coordination Unit, both based at the UNEP World Conservation Monitoring Centre, Cambridge, UK, provided helpful comments and suggestions.

Disclaimer: The contents of this booklet does not necessarily reflect the views or policies of UNEP or contributory organizations. The designations employed and the presentations do not imply the expressions of any opinion whatsoever on the part of UNEP or contributory organizations concerning the legal status of any country, territory, city or area and its authority, or concerning the delimitation of its frontiers or boundaries.

An illustration of a sea turtle with a green and brown patterned shell and head. The turtle is wearing a light-colored, woven hat. It is holding a magnifying glass in its mouth, which is positioned over a small text box. The magnifying glass has a black handle and a silver frame.

Disclaimer: Unless expressly stated otherwise, the findings, interpretations and conclusions expressed in this Publication are those of the various United Nations staff members, consultants and advisers to the United Nations Secretariat who prepared the work and

Table of Contents

Overview of the Need for Coral Reef Injury & Enforcement Investigation	4
Synopsis of the ICRI Coral Reef CSI Field Training Program	5
Introduction to the Coral Reef CSI Techniques	6
Application of Coral Reef CSI in Assisting Prosecution, Litigation, Mediation, Mitigation and Restoration	8
Coral Reef CSI Products	9
Overview of a Training Workshop	10
Sample Workshop Schedule	11
Workshop Instructional Organization	13
Lessons Learned	14
Examples of How Regions Have Applied the Training Directly Into Their Management Needs	15
Next Steps - Hosting A Training Workshop For Your Region	16
Contacts, Web Resources, & Toolkit Contents	17

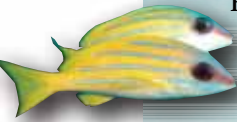
The Coral Reef CSI Field Training Workshops and program products have been funded to date by generous support from the U. S. Department of State, the NOAA International Program, The National Environment & Planning Agency (NEPA) of Jamaica, the Government of Barbados, and the International Union for the Conservation of Nature (IUCN).







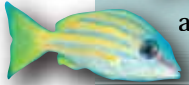
All photos in this booklet by either Dave Gulko © (2008) or Coral Reef CSI Workshop Staff and Participants (unless noted otherwise).



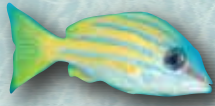
Overview of the Need for Coral Reef Injury & Enforcement Investigation



Regardless of region, most coral reef ecosystems around the world are under various levels of impact from illegal fishing, vessel groundings, destructive fishing, physical damage, coastal pollution and runoff, overfishing, illegal international trade, over-lapping (and often conflicting) use by various user groups, bleaching, chemical effects and endocrine disruption, alien species-associated phase shifts, and nutrient-associated phase shifts. Few areas have trained field investigators and well-developed natural resource programs to properly assess and handle the wide variety of anthropogenic events occurring; in most cases, such short-term human impact events often overwhelm the capabilities of resource managers to maximize prosecution, mitigation, negotiation, mediation, or litigation success. This takes on even greater significance in multi-country joint-investigations relative to shared coral reef impacts and illegal trafficking in coral reef products.



While legal systems and resource management strategies vary from country to country, and island to island; successful investigation strategies related to coral reef anthropogenic events are relatively limited, and as yet, unstandardized at the most basic levels. In 2006, groups of recognized experts, both in the United States (The Coral Disease and Health Consortium's Forensics Workshop Committee) and internationally (the International Coral Reef Initiative (ICRI) Committee on Coral Reef Enforcement and Natural Resource Investigation), proposed initiating a project to create such standards. Such a project, making use of both investigative and rapid ecological assessment techniques, marine evidence collection methods and handling, and education of both the public and decision-makers will enhance both resource protection and management capabilities. In essence, this is what has been developed as the International Coral Reef CSI Field Training Program.





Synopsis of the ICRI Coral Reef CSI Field Training Program

Beginnings of the Program

The Coral Reef CSI Program was designed in 2006 as a way for Coral Reef Managers, Enforcement Officers and other Natural Resource Trustee-associated Investigators, to receive training in underwater natural resource injury investigative techniques which could be used to hold a Responsible Parties (RP) accountable for an injury event, regardless of region or country. It was organized through the International Coral Reef Initiative (ICRI) Working Group on Coral Reef Enforcement and Investigation and received initial start-up funding from the United States' Department of State and the National Oceanographic and Atmospheric Administration (NOAA). In October of 2006 a pilot workshop was held in Cozumel, Mexico and involved 24 participants from 14 countries representing Marine Protected Area (MPA) and coral reef managers, enforcement officers, prosecutors and reef ecologists. The success of this first pilot workshop led to further development of the program through a series of field training workshops held around the world to raise regional capacity to investigate injury events.

The Regional Field Training Workshop Approach

With assistance from regional experts, each workshop on conducting in-water investigations is designed to best fit the marine natural resource injury and enforcement situations associated with the target region's nearshore coral reef resources. In large part, this training program is centered around an existing, multi-layered, 278-page toolkit composed of teaching modules on various aspects of coral reef investigation techniques and published in both Spanish and English. Types of investigation training include techniques applicable to vessel groundings; destructive fishing, illegal extraction or damage to protected resources, oil spills, chemical & sediment spills; pollution events including eutrophication; aquatic invasive species; and chronic sublethal events.



Introduction to the Coral Reef CSI Techniques

The Coral Reef CSI Approach: In-water Forensic Investigation



Previously, many of the injury investigation techniques focused heavily on scientific approaches modified from coral reef monitoring techniques; such techniques often were easily refuted by the Responsible Party (RP) or proved confusing to decision makers. The lack of focus on documentation and treating of data as evidence, created multiple opportunities for a RP to not be held accountable.

The Coral Reef CSI techniques combine an approach towards standardized criminal evidence collection modified for use underwater with a documentation of lost ecological services derived from various approaches to ecological risk assessment and habitat equivalency analyses. The techniques are specifically designed for use in remote areas, underwater, and by Natural Resource Trustee (NRT) agencies with minimal resources.

Such a strategy has the advantage of representing a scientific approach driven by legal needs, with a emphasis on documentation and formal chain-of-custody methodologies often seen in terrestrial law enforcement and wildlife criminal investigations. The Coral Reef CSI strategy has translated many of these techniques and approaches in such a way as to be used underwater for the first time. In doing so, they represent techniques already known in a different form to most decision-making bodies, and therefore are more likely to find acceptance when used to hold RPs accountable.

All of this was accomplished by the ICRI Committee on Coral Reef Enforcement and Investigation which brought together a diverse array of experts to tackle this problem. The group was made up of coral reef resource managers, a wildlife forensic specialist, a marine ecological risk assessment expert, a coral reef ecotoxicologist, a coral reef enforcement officer, an ex-homicide detective and an advisor to the internationally-known TV show "CSI".

The investigatory technique is based on a number of assumptions which drive the training:

1. That the case will go to court
2. That there are severe limitations in time, scale and resources
3. That the impacted resource is ecologically complex
4. That the area of injury is remote in nature

In general, the Coral Reef CSI techniques involve four major stages, three of which are conducted underwater. Collectively, the information derived can be used to document an RP's association with an injury event, show the damage pathway, document the range and effect of the damage, and estimate the lost ecological services and recovery rates in order to establish both restoration and mitigation options for the damaged resources.



Stages of a Coral Reef CSI Field Investigation:

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

Note that during the REA phase, fieldwork occurs not only on the impact site, but also on appropriate reference sites in order to quantify probable loss and establish estimates of recovery. The REA phase is critical to an investigation for mitigation and restoration decision-making.

The above chart represents an overview of the Coral Reef CSI protocol for conducting underwater investigations of human-caused, short-term injury events. The first phase relates to initiation of an investigation, the following three phases describe, in order, the underwater investigation dives. The Pre-Assessment is equivalent to securing and describing a crime scene on-land. The Impact Assessment is the evidence-collection stage; and the REA is similar to an ecological field autopsy used to determine what has been lost and how long it will take to recover.



Application of Coral Reef CSI in Assisting Prosecution, Litigation, Mediation, Mitigation and Restoration

A coral reef injury event often involves use of the investigation to support both penalty for damaging protected natural resources, and some sort of mitigation or restoration to repair or replace the lost ecological services.

The End Result of a Field Investigation: Penalty

One of the most important roles of a coral reef injury investigator is to provide clear and concise analyses during decision making processes such as court trials. Data analysis of the REA assessment, along with research on the recovery of other injury sites in the region, can be used to present an overall analysis of what an injury event means with regards to effecting the ecology of the natural resource, the use of the impacted natural resources by the public, or overall resource management. Recovery rates, economic displacement and costs, ecological phase shifts, and secondary impacts are of specific concern to a court or other decision-making body. Graphics and photos from the Coral Reef CSI field surveys are used to highlight visually the statistical analysis and physical evidence gathered from the injury scene. The training emphasizes these elements, leading from the field documentation and collection of evidence through its use by a decision-making body, such as a court of law.

The End Result of a Field Investigation: Repair

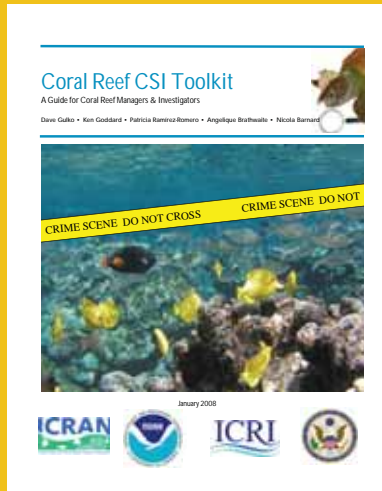
After the analysis and evaluation, decisions need to be made regarding whether the injury damage will be repaired, the resources restored to their pre-impact status, or whether the damage will be mitigated through other efforts either on-site or off-site. The field training approaches these questions through discussion of alternatives and mitigation design, weighed against the lost ecological services and documented damages.



Coral Reef CSI Products

A variety of products and tools have been produced to assist in this new field.

Dynamic 278-Page Toolkit:



Available in both English and Spanish, future translations to other languages, including French.



Also includes a reference CD full of additional material.

Underwater Flipbooks



An innovative approach involving a multiple-page underwater checklist in order to maintain a record of a coral reef injury investigation through all its phases on, in, and under the water. It contains both a color chart and a metric evidence scale for clearly documenting photographic evidence.

Complete Investigative Field Kits

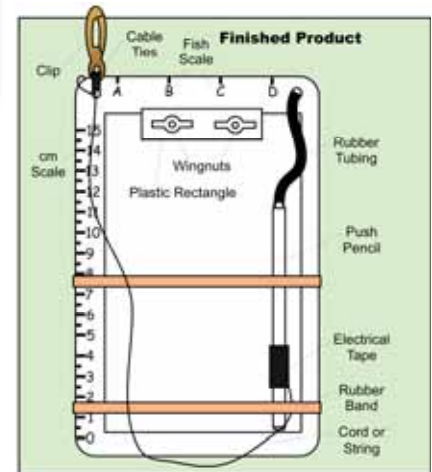


For many of the workshops, a complete field kit is provided containing all the equipment and supplies necessary to outfit a team to

conduct detailed underwater investigations, evidence collection, and determination of lost ecological services.

In general, the field kits are designed for portability, durability, accessibility, reliability and organization.

Underwater Data Slates



Each participant at every field training makes their own underwater data slate. In fact, most of the gear can be fabricated using directions contained within the toolkits.

Coral Reef CSI Apparel & Supplies

Field training participants receive Coral Reef CSI hats, shirts and examples of investigative supplies (underwater evidence collection, marking and storage) for their use.



Overview of a Training Workshop



The Coral Reef CSI Workshop

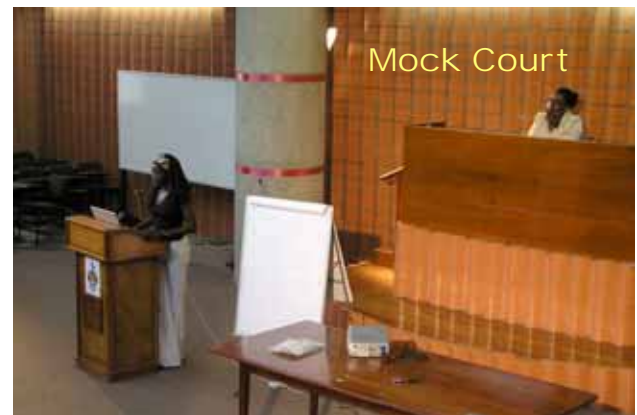
The five day training workshops are organized as outlined below:

1. Background talks on investigative strategies, field risk management, ecological risk assessment, coral reef forensic techniques, treating data as evidence, physical evidence collection, local reef ecological issues and impacts into an investigation.
2. Instruction on using various components of the coral reef investigative toolkit.
3. Practical field investigation sessions with staff evaluation.
4. A mock court session where the participants defend the evidence they collected underwater.



A key feature of the Training Workshops are a number of marine-based “crime/impact scenes” that the workshop participants investigate underwater using the equipment and techniques learned in the classroom and on dry land. The scenarios will be as realistic as possible and will involve actual field investigations and analysis by teams of workshop participants.

Instructional materials, reference materials and use of underwater investigative equipment are usually provided, along with housing, SCUBA tanks and boat transportation. Participants are responsible for their own personal dive gear (if this is unavailable, dive gear will be organized through the dive concession used for the workshop), and having an open and curious attitude regarding conducting field investigations of coral reef events to support risk assessments, mitigation, litigation, mediation, or prosecution. Accepted participants must be SCUBA-certified and present their certification card at the workshop. Participants will be trained to work as in-water investigative teams, using standardized marine CSI protocols and equipment to investigate a number of field coral reef injury (i.e. crime scene) scenarios.



Sample Workshop Schedule

The following represents a generic workshop schedule highlighting the day-to-day activities that occur. Note that in general, each major topic is introduced through classroom lecture and demonstration, which is then followed by an outdoor, terrestrial dry run where each team practices the technique, before utilizing their skills to investigate an injury scenario underwater during a SCUBA dive.

WORK SHOP DAY	ACTIVITY	TYPE
---------------	----------	------



Terrestrial Practice of Underwater Techniques

Day 1	Activity	Type
	Breakfast	MEAL
	Introduction, Make Gear, Intro to Coral Reef CSI	INTRO
	Lunch	MEAL
	Regional Issues, Safety Issues	LECTURE
	Gear, Safety	DRY RUN
	In-Water Crime Scene Demo	DIVE 1
	Dinner	MEAL
	Marine Injury Investigations	LECTURE

WORK SHOP DAY	ACTIVITY	TYPE
---------------	----------	------



Illegal Trap Fishing Scenario, Impact Assessment

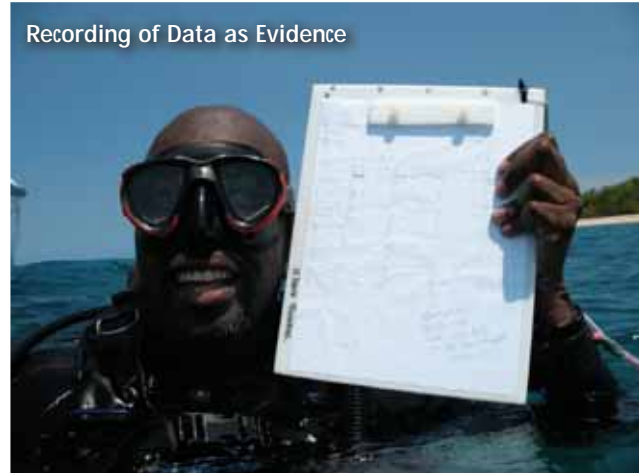
Day 2	Activity	Type
	Breakfast	MEAL
	Initiating Investigation	LECTURE
	Initiating Investigation	DRY RUN
	Lunch	MEAL
	Pre-Assessment	LECTURE
	Pre-Assessment	DRY RUN
	Pre-Assessment	DIVE 2
	Dinner	MEAL
	Impact Assessment	LECTURE
	Ecological Risk Assessment/ Risk Management	LECTURE
Day 3	Breakfast	MEAL
	Chain-of-Custody, Lab Sampling, Evidence Issues	LECTURE

WORK SHOP DAY	ACTIVITY	TYPE
	Impact Assessment	DRY RUN
	Lunch	MEAL
	Impact Assessment	DIVE 3
	Impact Assessment	DIVE 4
	Dinner	MEAL
	Rapid Ecological Assessments (REAs)	LECTURE



Day 4	Breakfast	MEAL
	Quiz/ REAs Pt II	LECTURE
	REA	DRY RUN
	REA	DIVE 5
	REA	DIVE 6
	Coastal Investigation	ACTIVITY
	Regional Issues	LECTURE
	Dinner	MEAL
	Data Analysis, Presentation, Courtroom Prep	LECTURE

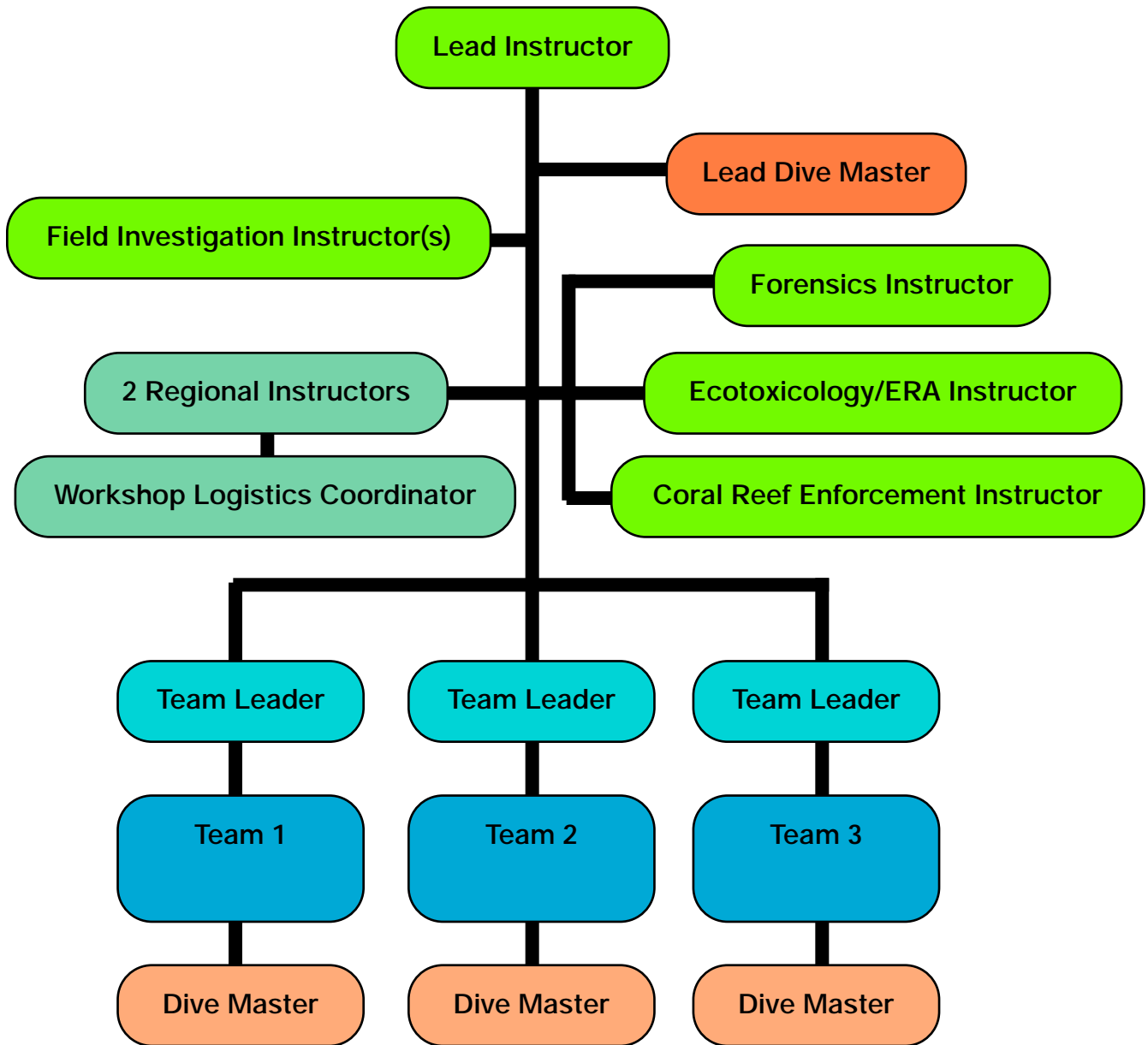
WORK SHOP DAY	ACTIVITY	TYPE
	Data Analysis	DRY RUN



Day 5	Breakfast	MEAL
	Mock Trial Activity	MOCK COURT
	Final Comments, Review, Evaluations, Certificates	LECTURE



Workshop Instructional Organization




Each workshop will contain a maximum of 18 participants broken down into three underwater training teams; each team will be led by a participant serving as the Team Leader, which we call a 'CROC' (Coral Reef On-Scene Coordinator). All diving will be supervised by certified Divemasters who will control in-water training activities under the supervision of a Lead Divemaster. Under the supervision of the Lead Instructor, a number of international and regional experts will serve as workshop instructors for the various aspects of the training. All on-site logistics will be coordinated by a regional Workshop Logistics Coordinator, who will be a recognized member of the local coral reef management or NGO community, and who will be responsible for all lodging, diving, classroom and local transportation logistics for the workshop. Standard staffing of a workshop includes a minimum of six staff to encompass the instructional roles listed above in the diagram. The ratio of trainers to participants is such to ensure a high standard of in-water safety is adhered to, and to maximize the quality of training, assessment and evaluation standards.



CR CSI Training Team conducting rapid ecological assessment, Cozumel, Mexico Pilot Workshop, October 2006

Lessons Learned

Through the five Coral Reef CSI field training workshops held up to the end of 2008, and the training of 81 participants from 22 countries, the program has continuously sought feedback through detailed evaluations filled out by all participants, and the results are incorporated into the follow-on workshops. Through this feedback, we have modified the workshops to increase the amount of dry run practice, formalized the toolkit, and refined the tools used. Furthermore, through a semi-annual newsletter for all workshop participants, we share ideas and lessons learned in applying the workshop techniques to real investigations with the developing coral reef injury investigation community we have trained.



**Coral Reef CSI
Participant Feedback Form**

To help us evaluate and further develop or improve the coral reef CSI training programme we would greatly appreciate feedback and constructive criticism on your experiences. Please tick the appropriate boxes below. Responses will be anonymous but for assessment purposes it will be helpful to know the following information:

Home country:
Affiliation (please circle as appropriate): National Resource Trustee, Government Agency, Enforcement Agency, Scientific Organisation, NGO.

The Toolkit
On a scale of 1-5, how helpful was the Toolkit to your learning, and the training process?

Rating	Not at all helpful		Useful		Very helpful
	1	2	3	4	5
Classroom work					
Practical activities					
Private Study					

Please give us your opinion of the content, user friendliness and format of the CSI Toolkit.

Rating	Poor	Average	Excellent
	1	2	3
Content			
Use-ability			
Format			

Suggestions for improvement:

How likely are you to use the Toolkit as a reference in your work?

Rating	Not at all	Occasionally	Often
	1	2	3

The Flipbook
Please give us your opinion of the content, user friendliness and format of the CSI Flipbook.

Rating	Poor	Average	Excellent
	1	2	3
Content			
Use-ability			
Format			

Suggestions for improvement:

Do you feel that the CSI Flipbook is a valuable additional product? (Please circle)
 YES NO

If not, please explain:

The Training
Please give us your opinion of the following aspects of the CSI Training. If a row is Not Applicable for this workshop, please place "N/A" next to it.

Rating	Poor	Average	Excellent
	1	2	3
Content			

Sample pages from the June 2008 Newsletter.



Examples of How Regions Have Applied the Training Directly Into Their Management Needs

Formation of Regional Coral Reef CSI Teams

One measure of success of the Coral Reef CSI workshops is preparations to establish regional multi-agency, multi-disciplinary, in-water injury investigation teams. The formation of regional teams are underway in the Yucatan (Mexico) following the Cozumel Workshop in 2006, Dominican Republic following the CAFTA Workshop, Jamaica following the Jamaica workshop, Sabah (Borneo) following the Southeast Asia Workshop. Additional teams are being organized in the Maldives, Thailand, Singapore, and Barbados.

Individual Use Of Coral Reef CSI

“On March 12th, 2008 the “CFS Palencia” a ship with Antigua & Barbuda flag ran aground in the Marine Reserve and Wild Life Refuge Punta Manabique. The Port Capitan of Santo Tomas and the fishermen of the Punta Manabique community gave notice of this event to the Mario Dary Rivera Foundation which co-manages the Reserve.

The ship was grounded for about 45 minutes, in which maneuvers to back down took place until the ship finally was freed and sail to Puerto de Santo Tomas in the Izabal Department; in the afternoon in Puerto de Santo Tomas the hull was inspected and it did not show breaks, only dents and paint removal.

The Wild Life Reserve of Punta de Manabique is 60% a marine area and 40% terrestrial. The terrestrial part has a conservation zone, a multiple uses zone, an intensive use zone and a mitigation zone. Within the marine area there are only four conservation zones.

The CSI workshop has been helpful to negotiate the evaluation of the impact site to get to know the damage of the grounding, we have establish a dialogue with the national authority that manages cargo ships, that navigate and dump their garbage and ballast waters within the Refuge. We have not filed a lawsuit regarding this incident because we expect to reach an agreement between the National Port Authority and the Mario Dary Foundation to conserve the marine ecosystems.”

(Letter from Mario E. Salazar Rodríguez, Fundación para la Conserv. del M. A. y Rec. Nat. Mario Dary Rivera, Guatamala; and a participant in the CAFTA Coral Reef CSI Field Training Workshop held in the Dominican Republic).

Next Steps - Hosting A Training Workshop For Your Region

The following represents an overall budgetary approach and a standardized timeline for a workshop:

Generic Workshop Budget

- Instructors: 3 international, 2 divemasters and a regional workshop logistics coordinator/instructor.
- Travel Costs: Site visit, workshop travel and hotel/per diem for instructors. Hotel and per diem (and possibly travel) for participants if regional.
- Equipment: Coral Reef CSI field kit (underwater cameras, GPS, survey gear, evidence gear, etc.).
- Supplies: Underwater slates, handouts, and workshop supplies.
- Contractual: Diving services, meeting facilities, printing of toolkits and flipbooks.
- Other: Shipping costs.
- Administration & Coordination: ICRAN, on behalf of ICRI, for management of project.

The total cost for a 5-day workshop in 2008 averaged \$55,000 USD. For 2009, the estimated costs for a workshop are \$62,000.

Generic Workplan

Month

Steps	1	2	3	4	5	6	7	8	9	10	11	12
Set up workplan; Coral Reef CSI proposal to funders. Identify target date for workshop.												
Information and document compilation from the funders and resource management agencies. Funders sign contract with ICRAN.												
Funding received by ICRAN; Regional Coordinator identified; document translation (if necessary)												
Identify possible workshop sites. Identify potential workshop participants. Plan site visit.												
Purchase and fabricate gear, supplies.												
Workshop Preparation												
Site Visit (Work out logistics, injury scenarios). Identify Regional Instructors.												
Participants list agreed; invitations sent. Handle Customs and permitting issues, if any.												
Accommodation, meeting room and diving booked. Accept participants, send workshop information.												
Coral Reef CSI Field Training Workshop												
Reporting to funders, other agencies.												



Awards Ceremony



Rapid Ecological Assessment (REA) to determine lost ecological services

Contacts, Web Resources, & Toolkit Contents

For Further Information:

If you represent a Natural Resource Trustee Agency (NRT) or assist NRTs (governmental or non-governmental) in your country and would like more information about the Coral Reef CSI Field Training Program, visit our website: <http://www.icran.org/action-csi.html>. If you have any questions, or would like to discuss hosting a Coral Reef CSI workshop for your region please contact : tyoung@icran.org and gulkod001@hawaii.rr.com .

Web Resources:



ICRAN has a full website section devoted to the Coral Reef CSI Program, including information regarding upcoming trainings, workshop information, and background on the program.

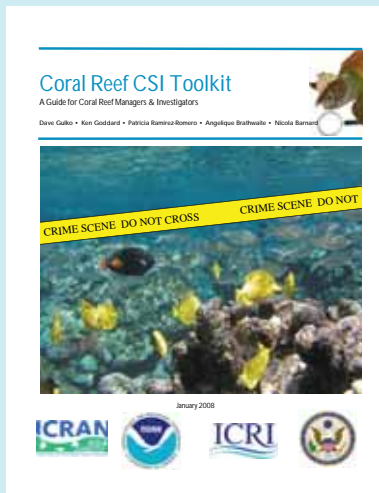
<http://www.icran.org/action-csi.html>



The ICRI Forum lists updates from the recent ICRI meetings where information about the Coral Reef CSI programs have been presented to update the ICRI members.

<http://www.icriforum.org>





TRAINING TOOLKIT CONTENTS

The toolkit is modular, allowing it to be expanded or easily modified for specific regions or trainings. The toolkit, which is currently printed in both English or Spanish (and soon to be produced in French), is composed of the following modules:



A. INVESTIGATING DAMAGE TO CORAL REEFS

- SECTION 1: INTRODUCTION
- SECTION 2: CSI: WHAT DOES IT MEAN FOR CORAL REEFS
- SECTION 3: TYPES OF IMPACT EVENTS
- SECTION 4: TYPES OF MARINE INVESTIGATORS
- SECTION 5: THE NEED FOR TRAINING
- SECTION 6: ENHANCING NOTIFICATION OF AN IMPACT EVENT
- SECTION 7: MANAGING AN UNDERWATER FIELD INVESTIGATION
- SECTION 8: THE GENERAL MARINE INVESTIGATIVE PROCESS
- SECTION 9: THE GENERAL CORAL REEF CSI PROCESS
- SECTION 10: OVERVIEW OF MITIGATION VERSUS RESTORATION VERSUS PENALTY



B. BASIC MARINE INVESTIGATIVE TOOLS

MODULE I: THE MARINE IN-WATER INVESTIGATION

- SECTION 1: CONDUCTING A SITE RECONNAISSANCE
- SECTION 2: PRE-ASSESSMENTS & SETTING AN EVENT PERIMETER
- SECTION 3: IMPACT ASSESSMENTS
- SECTION 4: CONDUCTING RAPID ECOLOGICAL ASSESSMENTS (REAs)
- SECTION 5: THE ROLE OF THE CORAL REEF ON-SCENE COORDINATOR (CROC)
- SECTION 6: ANALYSIS OF INVESTIGATIVE DATA

MODULE II: THE CORAL REEF CSI PROCESS IN-DEPTH

- SECTION 1: ARRIVAL AT, AND PRESERVATION OF, THE INJURY SCENE
- SECTION 2: INITIAL SEARCH FOR EVIDENCE AT RISK
- SECTION 3: COLLECTION OF EVIDENCE
- SECTION 4: ANALYSIS OF EVIDENCE
- SECTION 5: ECOLOGICAL RISK ASSESSMENTS (ERAs)



C. ADVANCED MARINE INVESTIGATIVE TOOLS

THIS SET OF MODULES (III - VII) TO BE DEVELOPED FOR FUTURE USE. WILL CONTAIN SECTIONS ON ADVANCED MARINE EVIDENCE COLLECTION TECHNIQUES, VESSEL IMPACT EVENTS, EXTRACTION IMPACT EVENTS, POLLUTION IMPACT EVENTS AND INVASIVE SPECIES EVENTS.



D. POST-INVESTIGATION TOOLS

MODULE VIII: RESTORATION AND COMPENSATORY MITIGATION

MODULE IX: PROVIDING ECOLOGICAL & RESOURCE IMPACT ANALYSES TO SUPPORT ENFORCEMENT ACTIONS

MODULE X: PROVIDING ECOLOGICAL & RESOURCE IMPACT ANALYSES TO SUPPORT PROSECUTION

SECTION 1: PROVIDING BACKGROUND ANALYSES

SECTION 2: THE ROLE OF THE EXPERT WITNESS

SECTION 3: DOCUMENTATION OF EFFORT FOR REIMBURSEMENT

MODULE XI: INTERACTING WITH THE NEWS MEDIA

SECTION 1: GETTING THE WORD OUT TO DECISION MAKERS & THE MEDIA

SECTION 2: MEDIA RESPONSE FORMS



E. APPENDICES

APPENDIX A: SAMPLE FIELD & DATA FORMS

APPENDIX B: OTHER TOOLS

SECTION 1: UNDERWATER PHOTOGRAPHY

SECTION 2: PERCENT COVER ESTIMATION TOOL

SECTION 3: OUTFITTING & MAKING YOUR OWN FIELD CORAL REEF CSI KIT

SECTION 4: CORAL REEF CSI GEAR MANUFACTURERS

APPENDIX C: ADDITIONAL SUPPORT

SECTION 1: EXPERT MATRIX

SECTION 2: RELATED WEB SITES

APPENDIX D: GLOSSARY

APPENDIX E: REFERENCES

APPENDIX F: INDEX



