Identification of protected corals

Final Research Report
DOC08309 / INT200703

Di Tracey

Overall Objective:

To identify samples of corals returned through the CSP observer programme during the 2007/08 fishing year
(1 October 2007 – 30 September 2008)

Specific Objectives:

1) Samples of corals returned by observers to be identified to lower taxa (families, genera, species)
2) Update the observer database (*COD*) as necessary with correct species identifications
3) Develop concise educational materials to complement *A Guide to Common Deepsea Invertebrates in New Zealand Waters* for observers on the identification of protected corals known to be caught during trawling
4) A variation to project – from additional funding, process and identify the "historic" MFish Observer coral samples (stored at Te Papa)

Specific Objective 1
Task 1: Providing input into observer briefing process

Including:
Species ID training
At-sea collection procedures
      e.g. sub-sampling
      labelling
      codes used

Aiming for consistency
of data on Observer Benthic
Materials Form

Observer Benthic Materials Form (Version 1 - October 2007)

1. Benthic Material includes all **Non-targeted** marine invertebrates, marine plants and/or structures that are connected with the seafloor. You should complete a **separate row** for each individual identifiable item.

2. Write the trip number [ ] and Observer code/s (*first letter of first name then first three letters of surname*) [.] and [.]

Sample number	Tow/Set number	MFish code	End Type	Weight (kg)	Method of analysis	Life status	Links	Quantity (code)	Number (optional)	Comments
B				.						
B				.						
B				.						
B				.						
B				.						
B				.						
B				.						
B				.						
B				.						
B				.						
B				.						
B				.						
B				.						
B				.						
B				.						
B				.						
B				.						

3. This form is page number [ ] for this trip. Is this form the last page for this trip? ➔ Yes [X] No [X]

Specific Objectives 1 & 4
Tasks

Sort and identify frozen samples, enter data into an electronic spreadsheet

Processed 539 coral samples, collected from
Oct 2007 to Oct 2008

Data records for each sample includes:
trip_no, station_no,
species ID
& codes, weight, count,
live or dead status

Identification

June & Dec 2008

ID was confirmed by taxonomists:
Sanchez, Opresko, Cairns, Molodtsova, Fautin, Watling, France, Matsumoto, Ardila, Duenas, Sinniger, Brugler

Spreadsheet updated
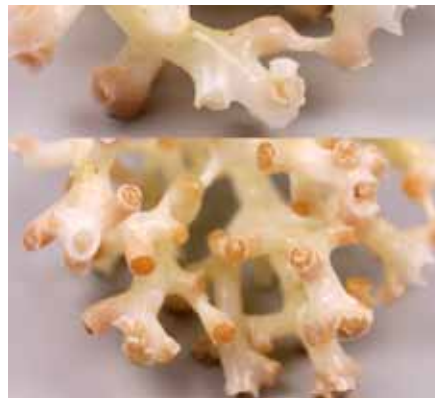
Identification cont'd
There was reasonable agreement between sorted & confirmed identifications – not quantified

Easily confused species:
 stony branching corals
 black corals
some hydrocorals and gorgonian corals (e.g. Primnoidae)

Samples retained at NIWA have been catalogued & loaded into the NIC[1] *Specify* database, & an extract containing following fields provided to DoC

Catalog number   (NIC *Specify* database Catalogue number)
Trip
Station
Latitude_start
Longitude_start
Start depth
PhylumTaxonName
ClassTaxonName
SubclassTaxonName
OrderTaxonName
FamilyTaxonName
GenusTaxonName
SpeciesTaxonName
Determination   (species name e.g. *Madrepora oculata)*
Lot number
No of specimens
Identified by   (e.g. Sanchez, Juan A.; Cairns, Stephen; Opresko, Dennis)
Date last modified   (e.g. 9122008 10:10:33 a.m.)
Remarks   (Opresko, Dennis sub-sampled from oversized *Bathypathes* B

Specific Objective 2

Update the observer database (*COD*) as necessary with correct species identifications

Input from sample ID spreadsheet data:
trip number
station number
species codes
weights
sample numbers
live status
was added from the sorted samples spreadsheet to associated event data in *COD* db
using the common link of

trip_number & station_number

Loading ID data into *COD*

Data loaded linking 'catch effort' (CE) & 'green weight'
(catch weight) from observer data to 'ID' records
& linked where 'obs species' = 'sort_id',
to match 'sort_id' to recorded obs green weight

Where there was no direct link on the species codes
e.g. trip 1823 station 63, observers recorded COU, JFI and
the ID spreadsheet listed 3 corals – BOO, CGR, SVA, then
records were inserted into *COD*

Extract

All data plus associated event information (e.g. target species, gear type) provided in extract to DoC

Some trips are without CE data (e.g. Antarctic toothfish (ATO) trips)

'Observer Benthic Materials Form' now in use but not punched hence there are missing data in extract

Invertebrate 'materials' data not in green weight section of catch forms, for the same catch

Fields in extract provided to DoC

trip_number
station_number
target_species
start_bottom_depth
end_bottom_depth
event_start_date
trunc_start_latitude
trunc_start_longitude
trunc_end_latitude
trunc_end_longitude
sample_no
label_id   (MFish code; often not provided)
sort_id   (by NIWA experts)
expert_id   (overseas expert's species identification – ground
                 truthing)
final_id
scientific_name
common_name
est_weight (estimated weight in kg)
status   (specimen 'live or dead' status)
species
sci_name
comm_name
greenweight   (from catch)

From MFish species codes links are made to 'Species Master' to obtain the species, scientific, and common names.

Outputs:

539 samples identified to lowest taxon representing ~33 different taxon e.g.

CHR	*Chrysogorgia* spp.	GOLDEN CORAL
COB	Antipatharia (Order)	BLACK CORAL
COF	*Flabellum* spp.	FLABELLUM CORAL
COR	Stylasteridae (Family)	Hydrocorals
COU		CORAL (Unspecified)
CRE	*Calyptopora reticulata*	White hydrocoral
DDI	*Desmophyllum dianthus*	DESMOPHYLLUM DIANTHUS
EPZ	*Epizoanthus* sp.	Epizoanthus sp.
ERO	*Enallopsammia rostrata*	DEEPWATER BRANCHING CORAL

& comprising 47.5 t of Cnidaria (corals, anemones, jellyfish, and hydroids)

Overall total weight Cnidaria in *COD* >670 t (1052 records since 1986)

Outputs cont'd:

Corals identified from 36 MFish/CSP observer trips targetting 13 fisheries: ATO Antarctic toothfish, BAR barracouta, BOE black oreo, CDL cardinalfish, HAK hake, HOK hoki, JMA Jack mackerel, LIN ling, OEO oreo, ORH orange roughy, SQU squid, SSO smooth oreo, WWA white warehou

Specific Objective 3

Develop concise educational materials to complement *A Guide to Common Deepsea Invertebrates in New Zealand Waters* for observers on the identification of protected corals known to be caught during trawling
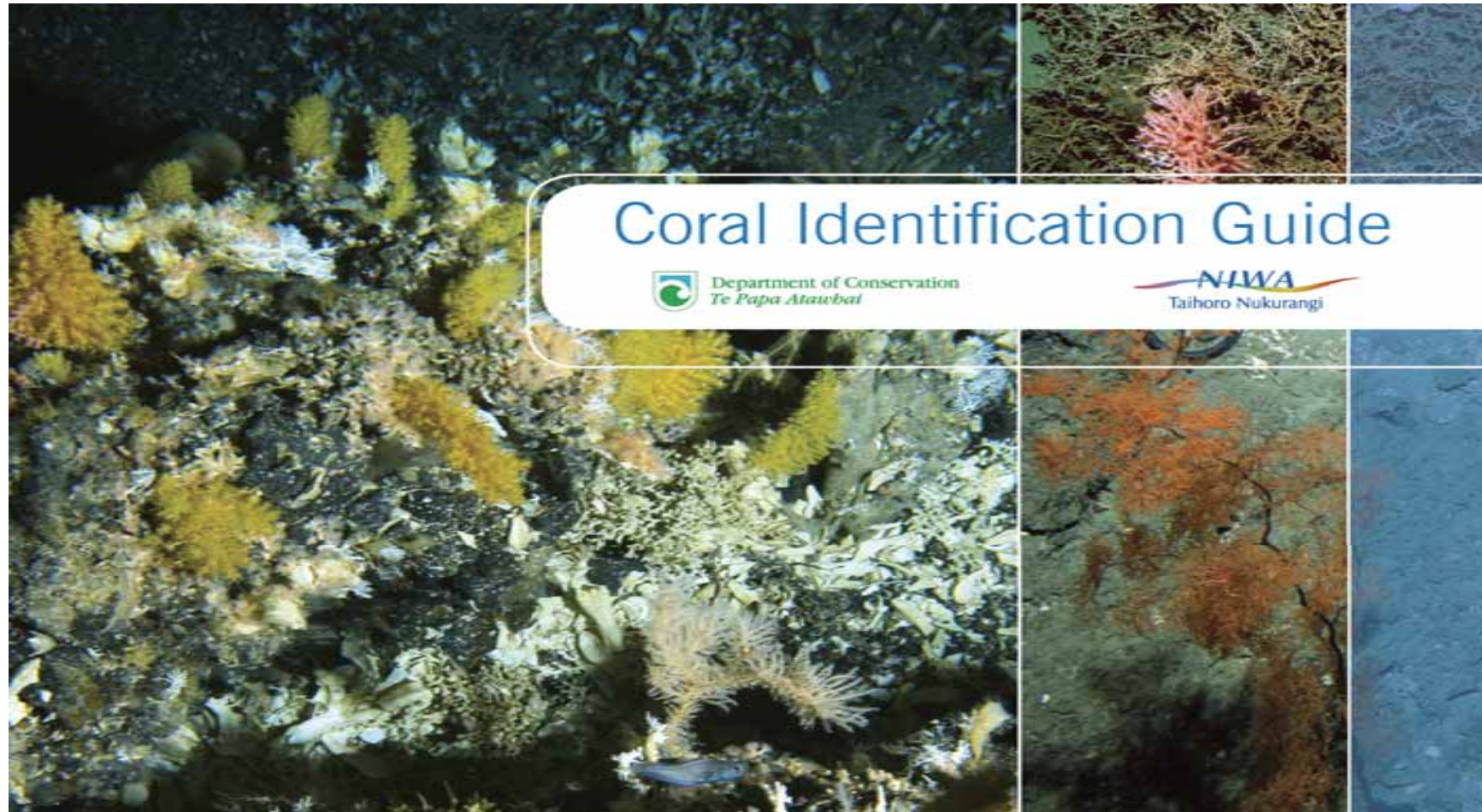
Development of guides aid at-sea identification
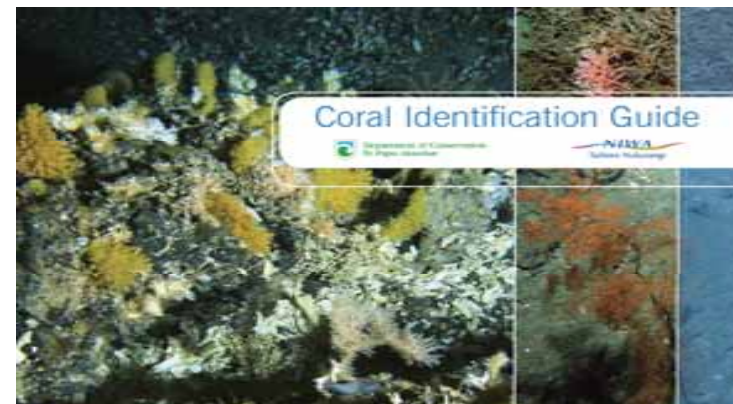
DoC funded educational material complements & further aids coral identification by observers, researchers, and managers – clear taxonomic descriptions of main coral groups

Coral ID Guide published
Tracey et al. (2008)

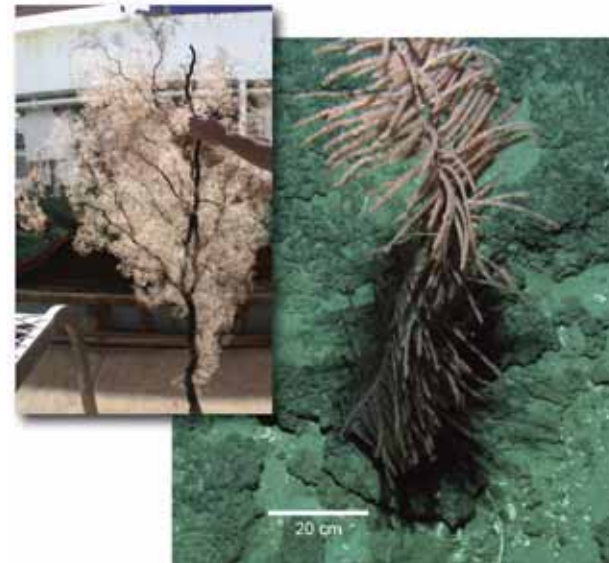# e.g. black corals sheet
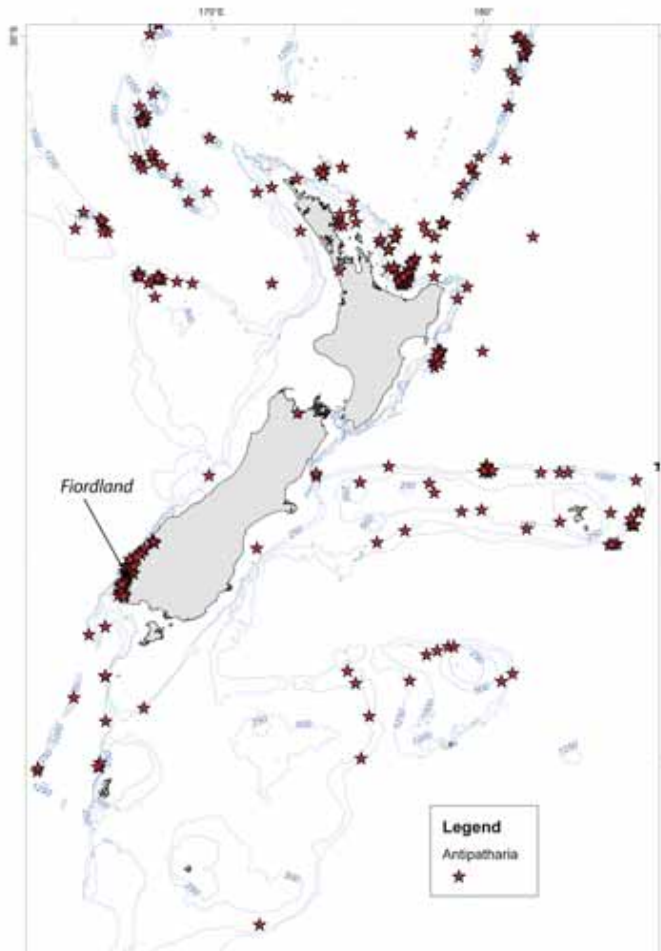

Black corals COB

All have spines on the smallest branches and very small polyps (< 1 cm in diameter).

- Colonies Unbranched and unpinnulated; straight, curved, whip-like or spirally coiled:
  - One row of polyps only: **Stichopathes COB**
  - Polyps all around stem or sometimes one side free of polyps: **Cirrhipathes COB**
- Colonies unbranched but with pinnules (terminal branchlets of nearly equal size) arranged in a symmetrical pattern on stem:
  - Feather-like colonies with upright or curved stem with 2 rows of straight or curved pinnules (rows sometimes close together on one side of stem): **Bathypathes COB**
- Colonies usually with sparse branching, and with pinnules on stem and branches:
  - 2 rows of alternately arranged pinnules, one row on either side; some pinnules with small secondary pinnules: **Dendrobathypathes COB**
  - 4 rows of long unbranched pinnules, 2 on each side of branch (grouped in pairs); branches appear feather-like: **Lillipathes COB**
  - 4 rows of pinnules; 2 lateral (opposite) rows of long, unbranched pinnules and two anterior rows of shorter, branched pinnules; colonies often very slimy: **Trissopathes COB**
  - 6 or more rows of unbranched pinnules, equal number on either side of stem and branches (bottlebrush appearance); small colonies often unbranched with long stem: **Parantipathes COB**
- Colonies densely branched, without distinct pinnules (smallest branchlets not of uniform size or arrangement, but sometimes restricted to sides of branches in fan-shaped colonies):
  - Colonies fan-shaped, densely branched with multiple orders of branches; smallest branches numerous, irregular, but somewhat alternately arranged on opposite sides of larger branches: **Antipathes** (Antipathes cf. speciosa)
  - Colonies loosely spreading, with multiple orders of branches; thicker branches usually smooth and polished; small branches often curved, with branchlets of the next higher order appearing on the convex side: **Leiopathes** (**L. secunda LSE** pg 57)
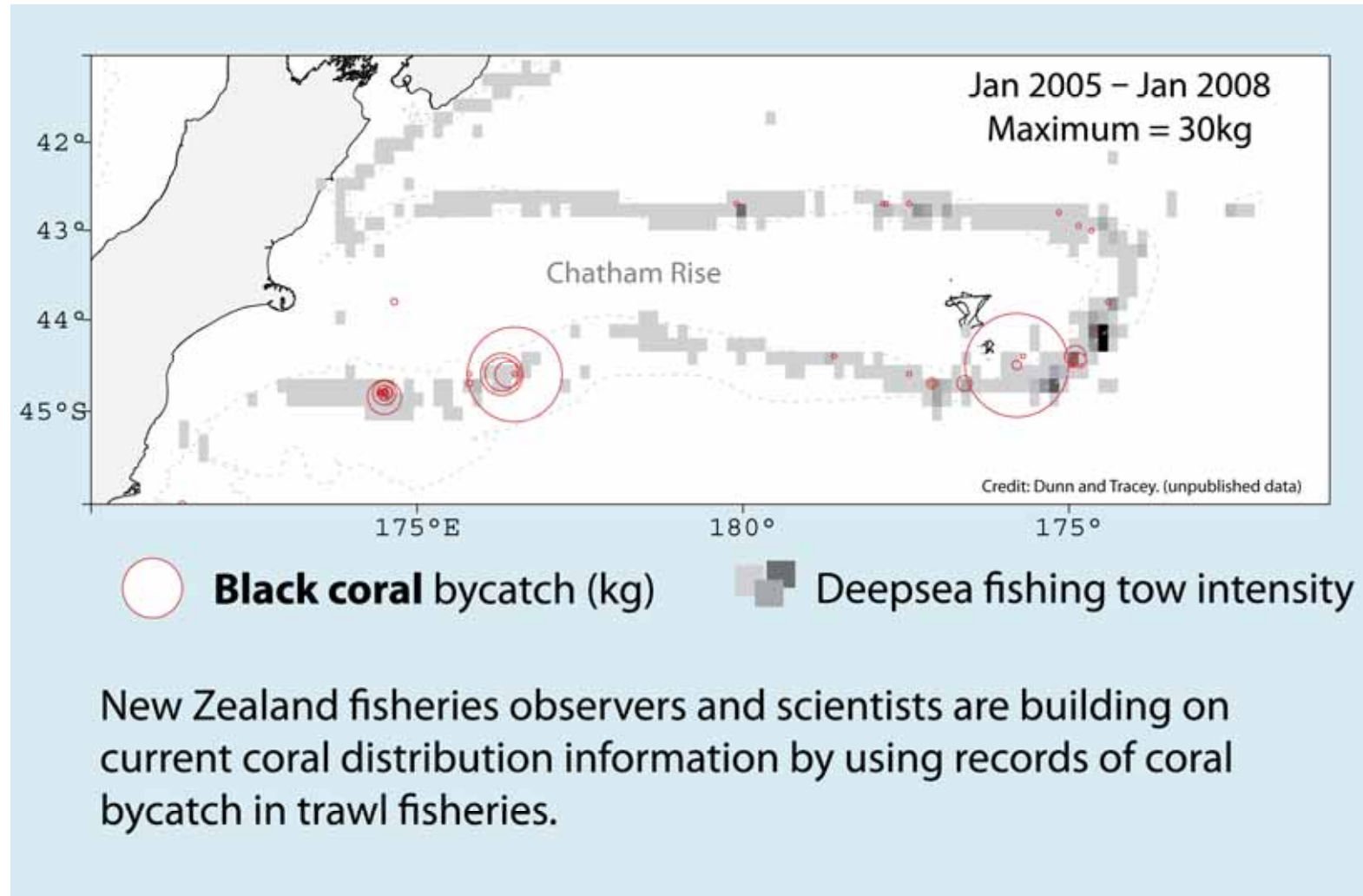
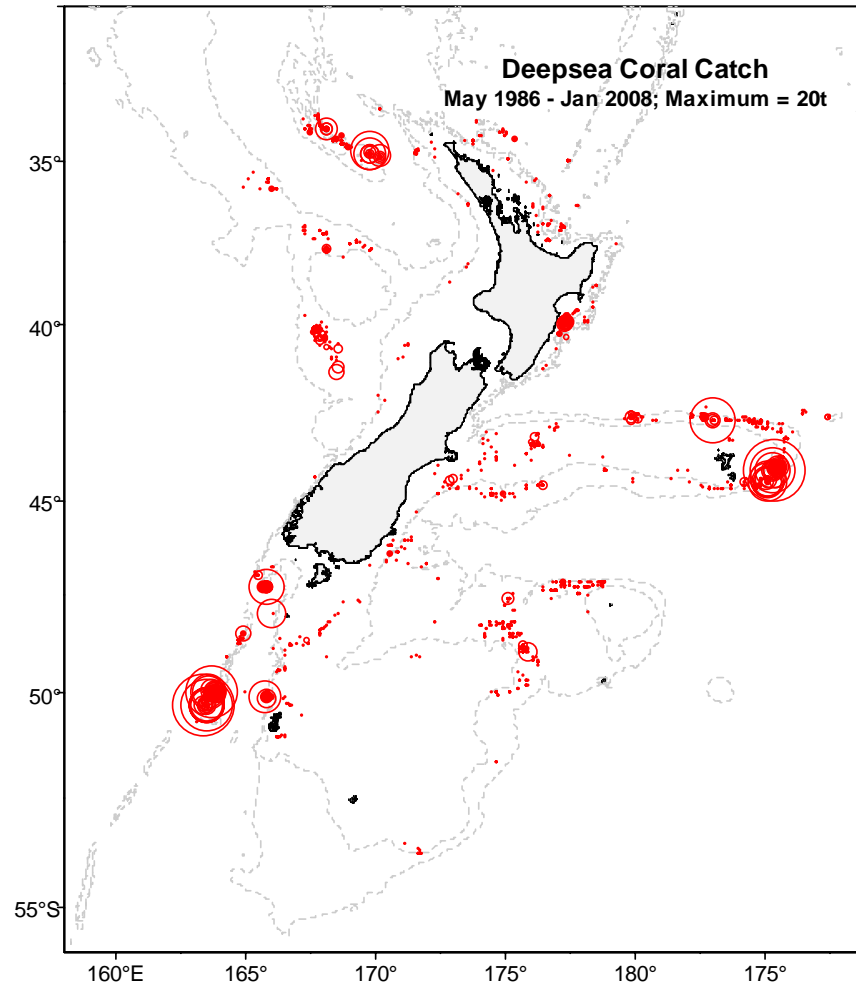# Data application: distribution plot of black corals Antipatharia

Data source includes *COD*

Data application: coral by-catch plots overlaid with commercial fishing effort

Jan 2005 – Jan 2008
Maximum = 30kg

Chatham Rise

Credit: Dunn and Tracey. (unpublished data)

Black coral bycatch (kg)   Deepsea fishing tow intensity

New Zealand fisheries observers and scientists are building on current coral distribution information by using records of coral bycatch in trawl fisheries.

Data application: plot of coral by-catch when targetting deepsea species

Deepsea Coral Catch
May 1986 - Jan 2008; Maximum = 20t

Largest circle denotes
 20 t

Depth contour
 750 & 1500 m

Data source *COD* db

Summary comments:

Data quality issue with some observer records e.g.

- unrealistic weights recorded for particular species

- pre ~2005 certain codes not reliable – e.g. COR sometimes used for coral but this is code for hydrocoral; when code COU used confident = coral

More recent & accurate use of codes is improving the dataset

Require some new MFish codes e.g. for Primnoidae - to add to ID Guide along with some suggested updates

Benthic by-catch form data yet to be entered into *COD*

Significant coral catches are still being made – 47 t during year of this project

From identification of protected corals programme

•Accurate identification data can be used to assess the incidental catch of corals (both of the protected, or proposed to be protected, groups)

•Distribution plots can be produced to elucidate the relationships between invertebrates and commercial fishing activity and so improve areal and vertical distribution knowledge of coral taxa within and outside the EEZ

•Protected species interactions with commercial fisheries can be monitored and quantified

•Data can be used to add to descriptions of biodiversity of seamount / non seamount habitats and provide information useful for the consideration of potential MPA's

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