

# ***COMPUTER SCIENCE TECHNOLOGY APPLIED TO DATA COLLECTION AND DATA MANAGEMENT***

## **Authors.**

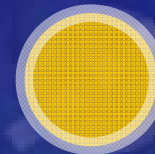
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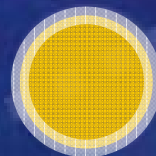
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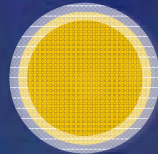
UPDATED  
COMPUTER SCI  
PLATFORM



UPDATED  
INFRASTRUCTURE  
AND EQUIPMENT



COMPETENT  
HUMAN  
RESOURCES



**INSTITUTO DE  
FOMENTO  
PESQUERO**

# ***INTRODUCTION***

**In Chile the Institute for Fisheries Development (IFOP) has the mission to provide to the Undersecretary of Fisheries, the technical information and scientific basis for the regulation of Chilean Fisheries.**

**With the intention to improve the process of data collection, since year 2005 a group of IFOP's scientists has developed:**

- New computer science system for data collection in large quantities and data management.**
- Automatic publication of fishing and biological indicators in Web Page.**

**The project was financed by the Governmental Corporation for Production Promotion (Corporación de Fomento de la Producción, [www.corfo.cl](http://www.corfo.cl)).**

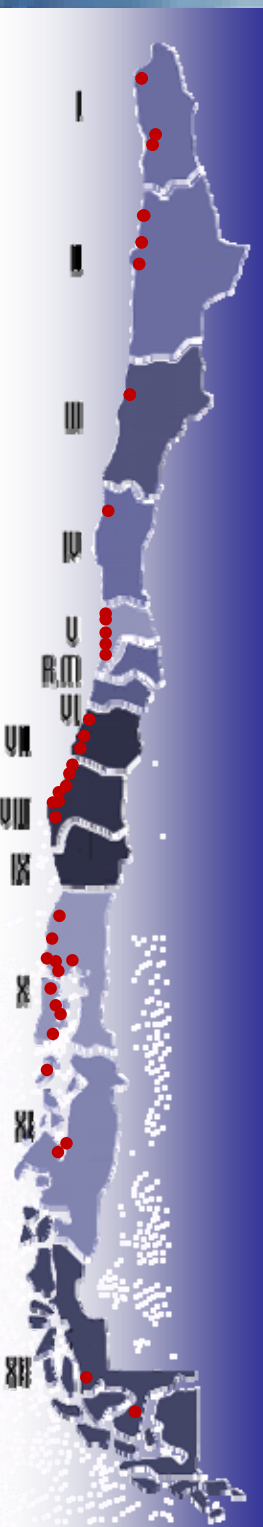
# **METHODOLOGY**

The modernization project of data collection system for IFOP began year 2005 and was carried out by scientists and technical personnel of this institution. This entail to develop following software and systems:

- Electronic forms for data entry in Pocket PC (PDA).
- Data entry in PDA. **First data check.**
- Mobile data transmission form PDA to Temporary Data Base.
- Reception in Temporary Data Base and verification of data integrity. Feedback to Sc. Observer in PDA.
- Data quantity control entered in Temporary Data Base from PDA. Control on data collection effort. **Second data check.**

# ***METHODOLOGY***

- Report Sc. Observer data collection summary by fishing trip. Control on data collection effort.
- Data debriefing by Field Coordinator. Control on data collection effort. **Fourth data check.**
- Digital validation to identify and tag data error in main data base. This software has 120 verification rules. **Fifth data check.**
- Project Manager final data check through data analysis.
- Algorithms for automatic assessment of biological indicators published in Web Page.
- Web site to publish biological indicators.



- Arica
- Iquique
- Chanavayita
- Tocopilla
- Mejillones
- Antofagasta
- Caldera
- Coquimbo
- Los Molles
- Pichicuy
- Quintero
- Valparaíso
- Sn. Antonio
- Duao
- Curanipe
- Constitución
- Cocholgue
- Tome
- Talcahuano
- Tubul
- Tumbes
- Lavapié
- Lebu
- Bahía Mansa
- Pto. Montt
- Calbuco
- Carelmapu
- Mauñín
- Ancud
- Dalcahue
- Queilen
- Quellón
- Melinka
- Pto. Aysén
- Pto. Natales
- Pta. Arenas
- Porvenir
- Pto. Williams

***DIMENSION OF THE PROBLEM TO PROVIDE WITH OPPORTUNE AND RELIABLE INFORMATION TO THE UNDERSECRETARY OF FISHERIES***

**REQUIREMENTS OF BIOLOGICAL AND FISHERIES DATA**

- 7 Annual projects to monitor the national fisheries performance**
- 4 Permanent fisheries research projects**
- 6 Transitory fisheries research projects**
- 6 Hydro acoustic research projects for fish assessment**

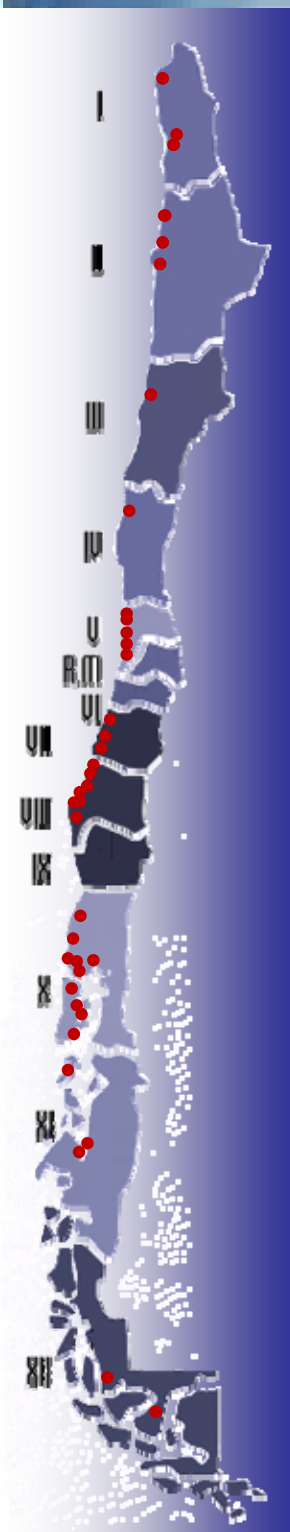
**STAFF OF DATA COLLECTION SECTION**

- 1 Chief Section**
- 3 General Coordinator**
- 13 Field Coordinators**
- 154 Scientific Observers**

**STAFF OF COMPUTER SCIENCE DEPARTMENT**

- 1 Chief Department**
- 6 Data Checkers**
- 2 Data System Administrator**
- 2 Data Base Administrator**





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## ***MANGITUD OF THE PROBLEM TO PROVIDE WITH OPPORTUNE AND RELIABLE INFORMATION TO THE UNDERSECRETARY OF FISHERIES***

### **COVERAGE OF DATA COLLECTIO OF FISH, CRUSTACEANS AND BENTHIC**

**11 data collection bases (main offices)**

**48 data collection centers (secondary offices)**

**1 130 data collection points**

**410 surveyed species**

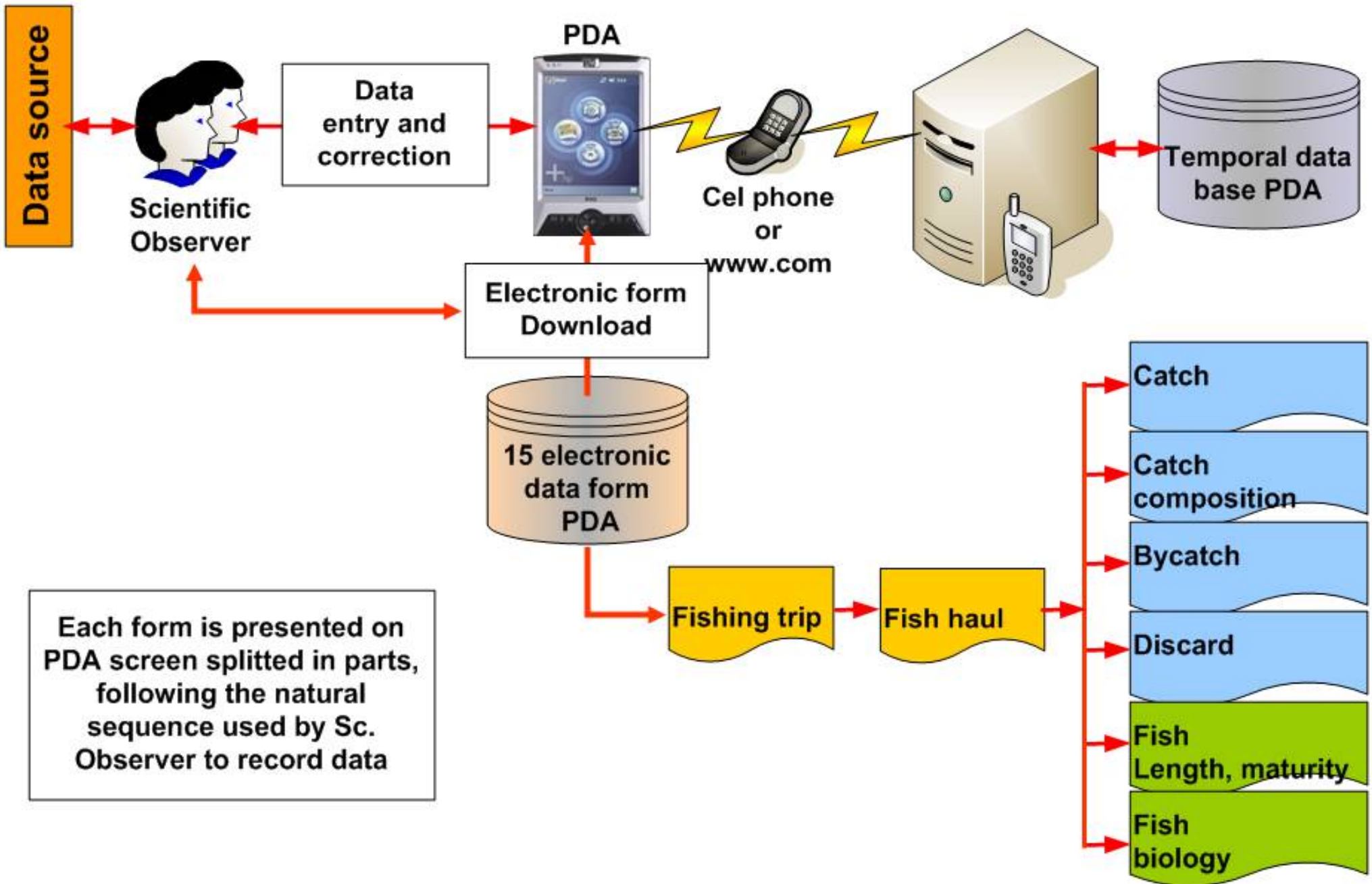
**3 300 annual surveys onboard industrial vessels**

**14 400 annual surveys to small craft fisherman**

**20 500 annual inquiries of fishing log books**

**2.9 million sampled units of fish, crustaceans and benthic.**

# DATA COLLECTION AND TRANSMISSION WITH PDA



# EXAMPLES OF PDA DATA ENTRY SCREENS

## Logbook

Bitacora 17:41

Barco: PIONERO II - (94)  
Fecha de Recalada: 22/09/2005 17:17

Campo	Valor
Costo total del	
Rut patron de	
Numero de lances	
Valor de la Carnada	
Direccion a la zona	

Cerrar

1 2 3 4 5 << Ok  
6 7 8 9 0 ,

## Fishing Haul

Crear Lance 18:50

Nº Lance: 1  
Fecha: 22/09/2005 18:39

Campo	Valor
Tamaño de malla en	
LATITUD	34
Longitud	44
Zona de pesca	
FECHA_HORA_INI_	

Nuevo Lance Cerrar

1 2 3 4 5 << Ok  
6 7 8 9 0 ,

## Catch

Crear Captura 12:57

Nº: 1  
Especie: CABALLA

Campo	Valor
Unidad de	
Precio de venta por	
destino de la	
Captura de la	

Nuevo Captura Cerrar

1 2 3 4 5 << Ok  
6 7 8 9 0 ,

Captura Fauna Descarte <<

## Catch composition

Editar Proporción 15:11

Nº: 1  
Especie: ANGIULA, CONGRIO PARD...  
Estado: Entero

Campo	Valor
N de Ejemplares de	590
Peso de la	80

Ir A < > Borrar Cerrar

1 2 3 4 5 << Ok  
6 7 8 9 0 ,

Longitud Proporción Biológico <<

## Fish length

Crear Longitud 11:11

Nº Lance: 1  
Especie: 103 - raya espinosa  
Nro: 1

Campo	Valor
Longitud Total	
Longitud de	
Sexo	
Madurez Sexual	
N.Total de	

Nuevo Ejemplar Cerrar

1 2 3 4 5 << Ok  
6 7 8 9 0 ,

Proporción Longitud Biológico <<

## Fish biology

Crear Biológico 11:11

Nº Lance: 1  
Especie: 10 - raya  
Nro: 2

Campo	Valor
Longitud Total	
Peso Total	
Sexo	
Madurez Sexual	
Recepcion	

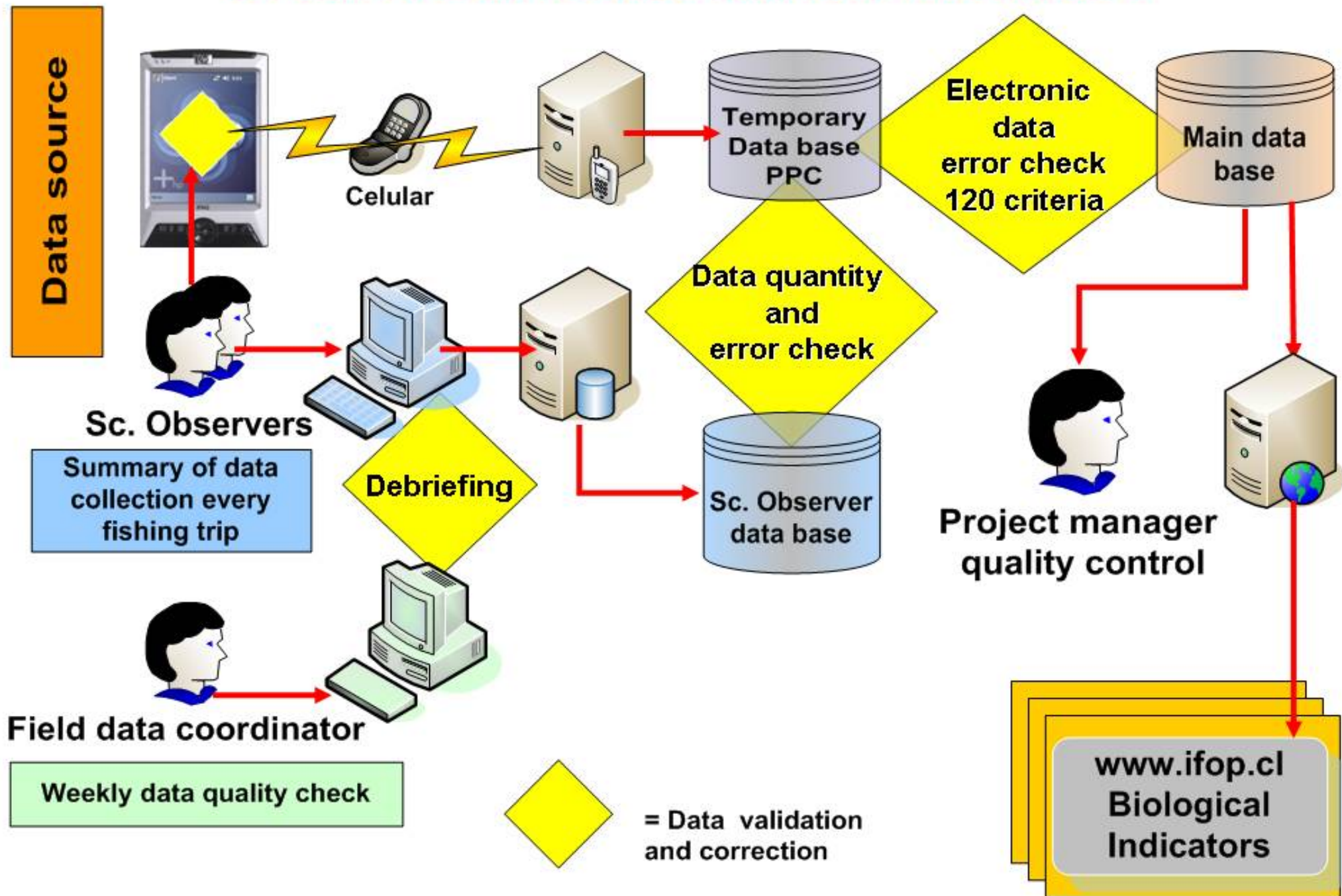
Nuevo Ejemplar Cerrar

1 2 3 4 5 << Ok  
6 7 8 9 0 ,

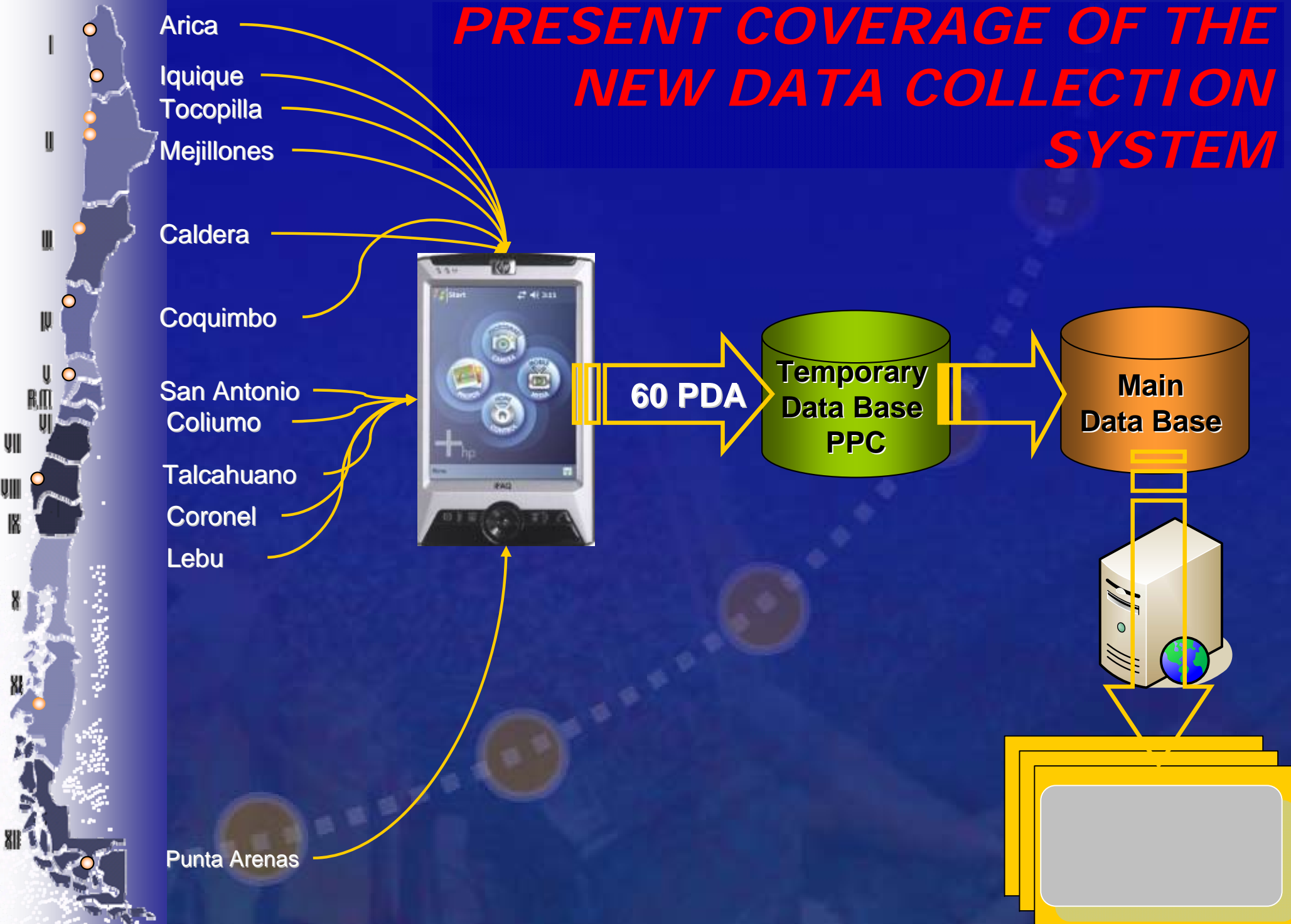
Proporción Longitud Biológico <<



# PROCEDURE FOR DATA QUANTITY, OPORTUNITY AND ERROR CONTROL



# PRESENT COVERAGE OF THE NEW DATA COLLECTION SYSTEM



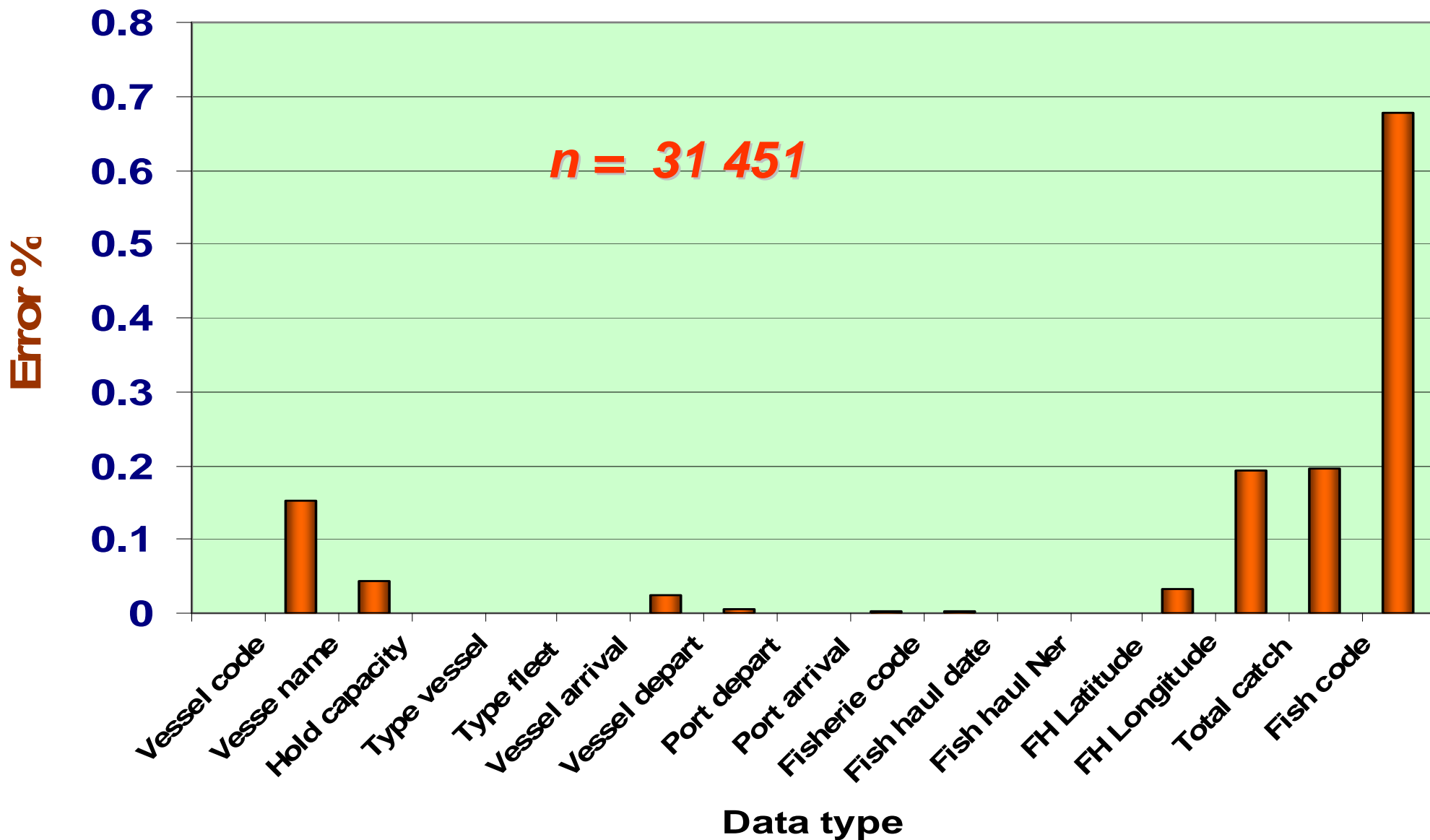
# ***MAIN ATTAINED ACHIEVEMENTS***

<b>ACTIVITY</b>	<b>Year 2006</b>	<b>Year 2009</b>
<b>Time delay between PDA data collection, data check and input in main data base</b>	<b>80 days delay</b>	<b>10 days delay</b>
<b>Report of data requirement fulfillment regarding quantity, opportunity and coverage</b>	<b>No report</b>	<b>Monthly report</b>
<b>Report of data error</b>	<b>No report</b>	<b>Monthly report</b>
<b>Automatic publication of Biological Indicators in Web Page</b>	<b>No report</b>	<b>Monthly report (*)</b>

**(\*) Footnote;** monthly report per fisheries including trends of last 5 years of following indicators: landings, effort, size distribution, mean size and sexual maturity indices.

# MAIN ATTAINED ACHIEVEMENTS

## Data Error



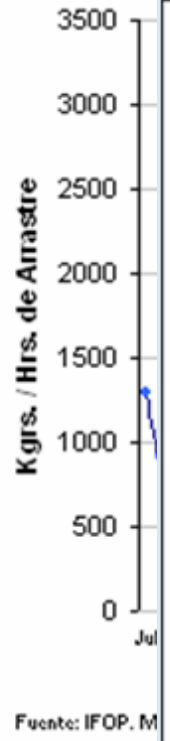


# WEB PAGE OF FISHERIES AND BIOLOGICAL INDICATORS

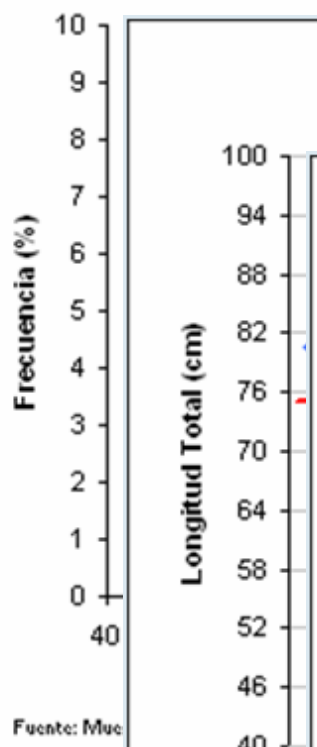
- SUS OPCIONES**
- Quiénes somos
  - Acceda a los recursos
  - Home page
  - Contactos
  - Enlaces
  - Cerrar sesión

- Información**
- Recursos Pesqueros
  - Recursos de Pesca
  - Oceanografía
  - Áreas de Manejo
  - Ind. Biológico
  - Enlaces
  - Proyectos FIP
  - Ifop-Exploración
  - Ifop-Marea Roja
  - Noticias
  - Glosario
  - Acceso WebMail

## RENDIMIENTO DE PESCA MENSUAL MERLUZA DEL SUR, MERLUZA AUSTRAL

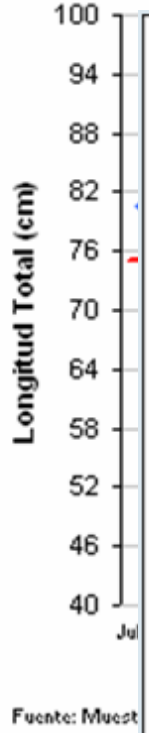


### ESTRUCTURA DE TALLAS Zona 1 (41° 28' S - 47° 00' S)



### MERLUZA DEL SUR, MERLUZA AUSTRAL Mago 2009

### Talla Media Mensual MERLUZA DEL SUR, MERLUZA AUSTRAL



### IGS Hembras Mensual MERLUZA DEL SUR, MERLUZA AUSTRAL

