

# **HAB MONITORING PROGRAM OF THE PHILIPPINES**

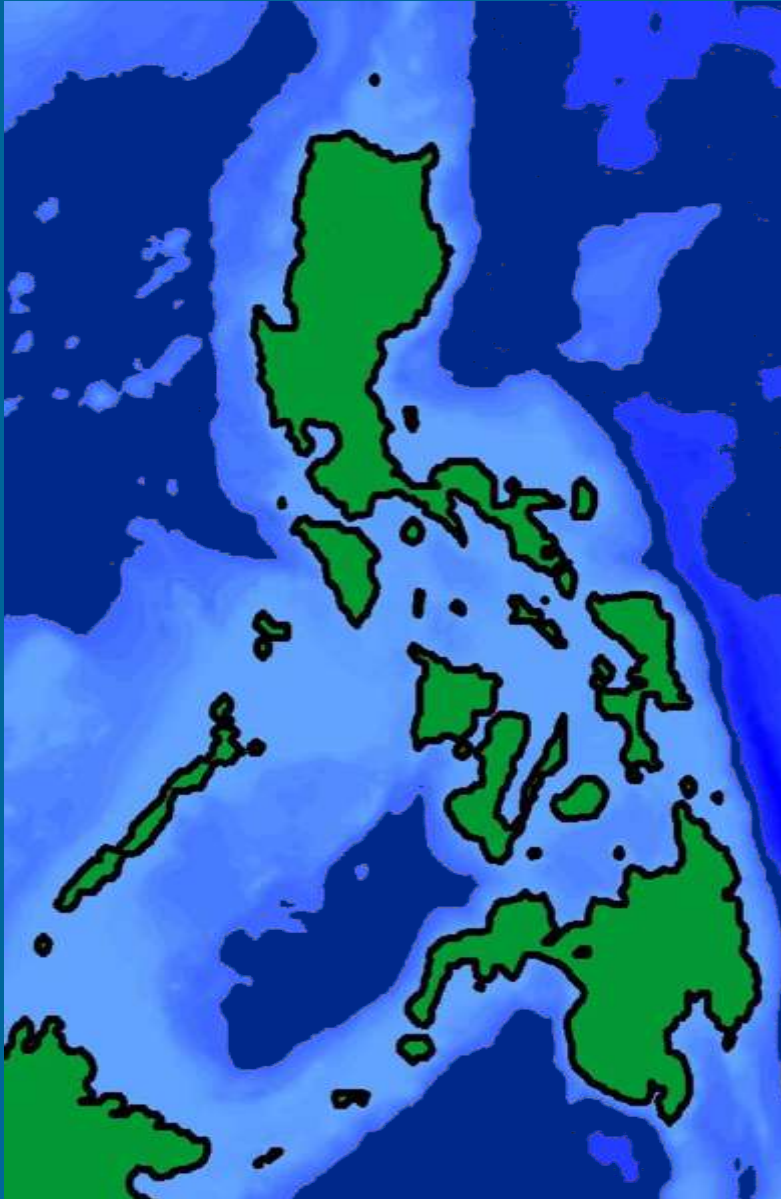


**Sandra Victoria R. Arcamo**  
**Fisheries Resources Management Division**  
**Bureau of Fisheries & Aquatic Resources**

# TOPICS

- **Background**
- **Legal Basis**
- **BFAR Monitoring Program**
- **Monitoring Activities**
- **Collaborative Activities**
- **Current activity**
- **Future Plans**

# PROFILE



- Archipelago >7,100 islands
- 3 major island groups
- 37,000 km coastline
- 2.2M km<sup>2</sup> total territorial waters
- 60 coastal of total 73 provinces
- 17 coastal of total 25 cities
- 68% of fisherfolk are small scale fishers

# BIVALVE PRODUCTION

## Aquaculture

	2010	2011	2012
Oyster	22,625.52 MT	21,461.82 MT	20,648.37 MT
Mussel	20,876.79 MT	22,442.71 MT	25,660.44 MT

## Inland Waters

	2010	2011	2012
Oyster	1,282.56 MT	1,796.28 MT	1,397.24 MT
Clams	1,273.38 MT	1,623.49 MT	2,435.41 MT
Others	1,399.22 MT	1,544.22 MT	1,890.41 MT







# BACKGROUND

first outbreak  
in Maqueda  
Bay & Samar  
Sea

1983

US\$ 5M loss

Pyrodinium  
bloom was  
observed in  
Masinloc Bay,  
Zambales,  
recurred in  
Samar

1987

\$500,000/day on unsold shrimp products

US\$950,000 by mussel growers in Manila Bay

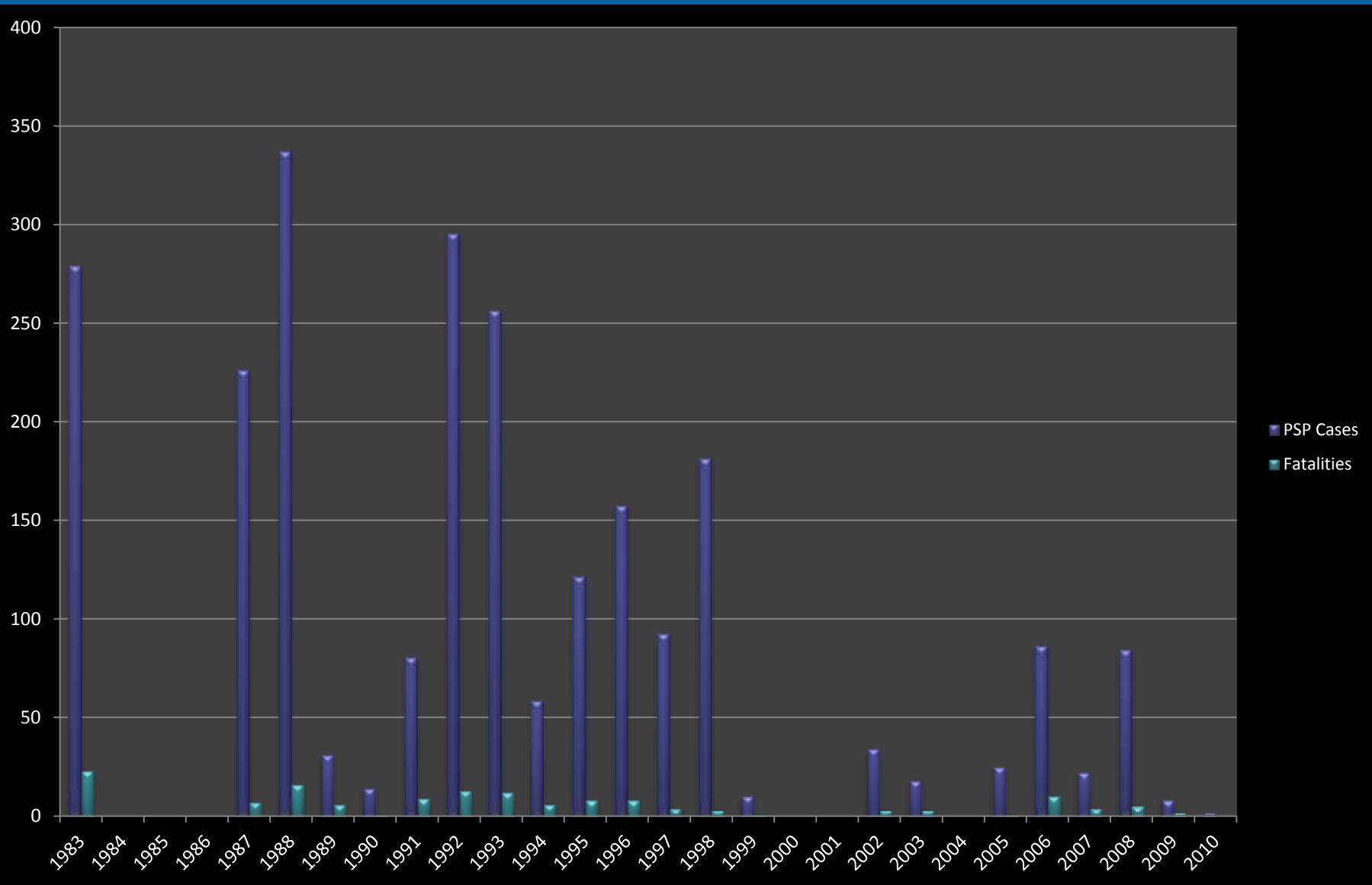
Commercial fishing boat operators lost \$809,524

Pyrodinium  
sighted in  
different coastal  
waters of  
Manila Bay and  
Visayas region

1988-89



# BACKGROUND



# BACKGROUND



**1980s**



**1990s**



**2000s**

Source: Bajarias and Arcamo 2005

# BACKGROUND

PSP causative organisms that were  
found in the Philippines

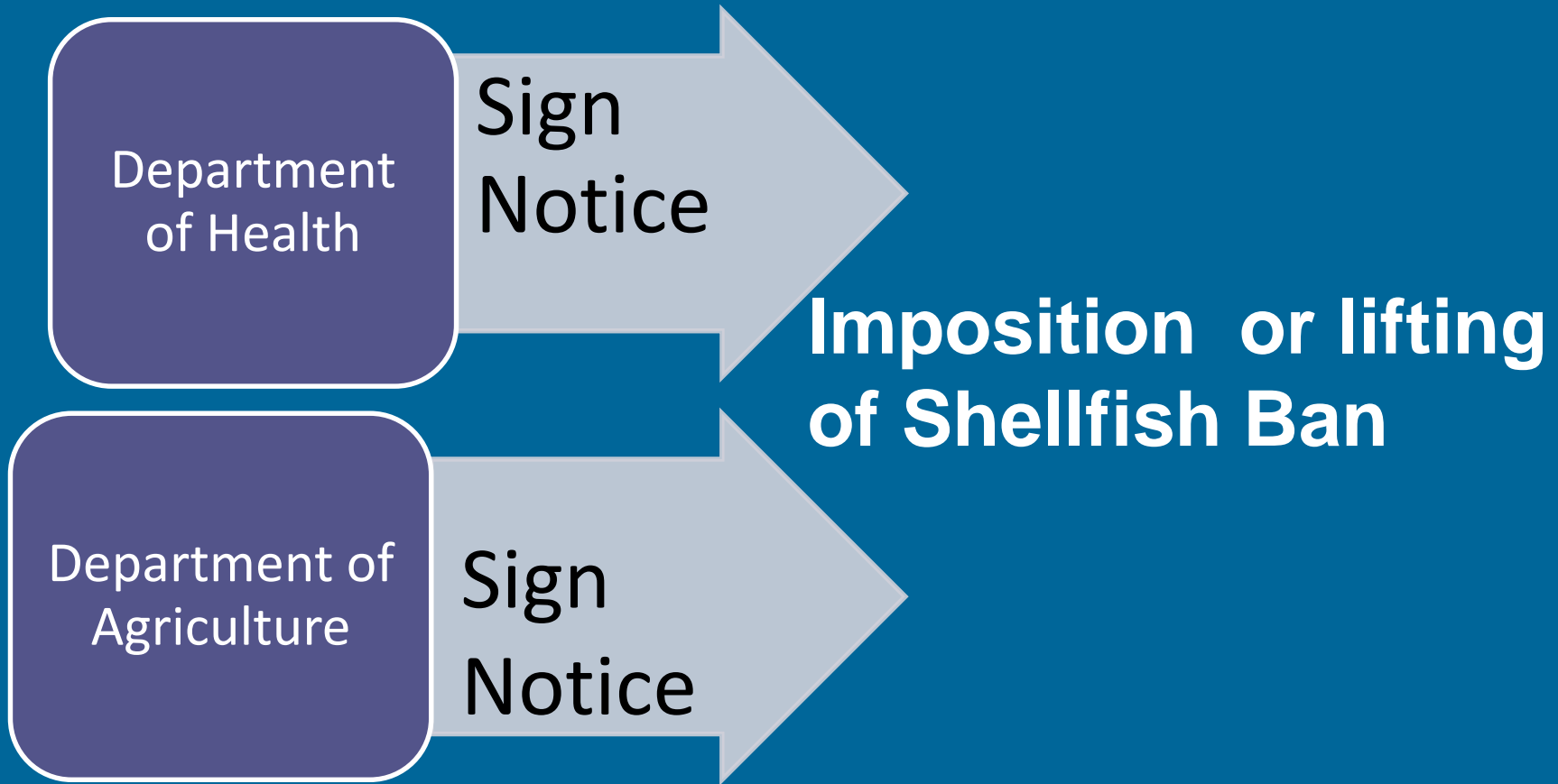


*Alexandrium minutum*  
*Gymnodinium catenatum*  
*Pyrodinium aureolum*  
*Alexandrium tammyavanichii*

# LEGAL BASIS

- RA 8550 the Philippine Fisheries Code of 1998
- Consumers' Act
- The Philippine Code of Sanitation 1976
- Philippine Food Safety Act 2013
- Fisheries Administrative Orders 227, 234, 235

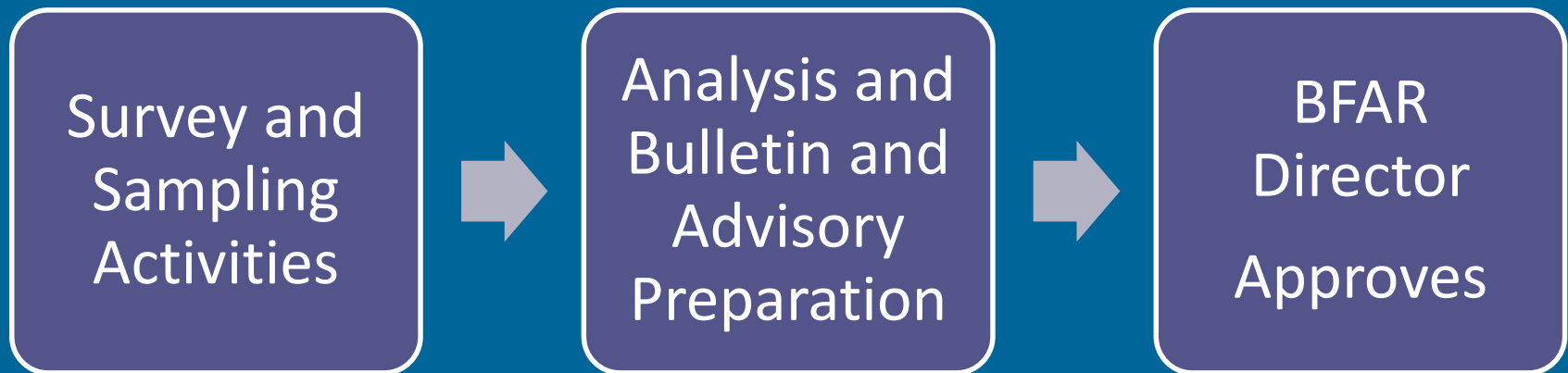
# MANAGEMENT AUTHORITY



**1988 to 1999**

# MANAGEMENT AUTHORITY

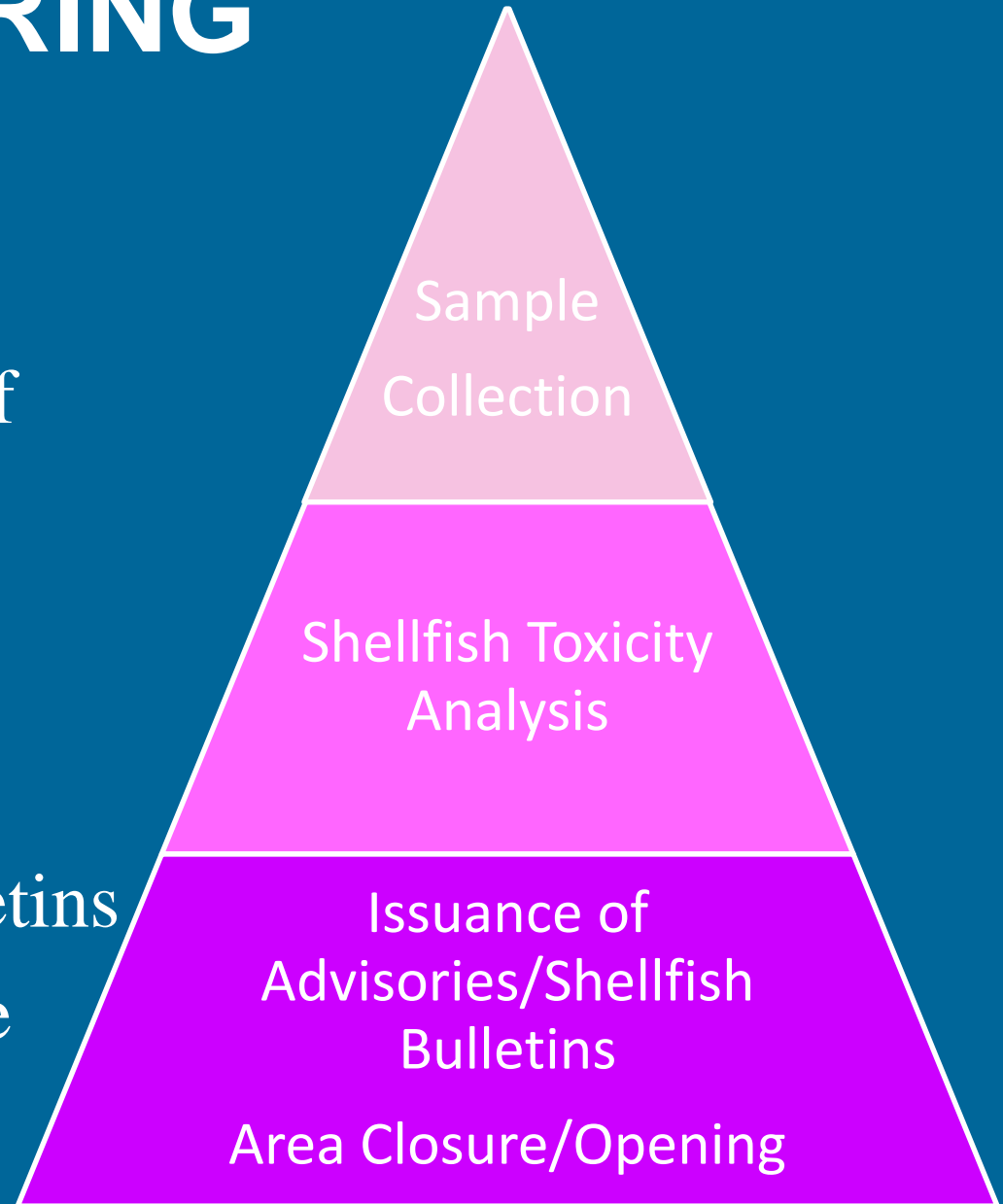
## Imposition or lifting of Shellfish Ban



**2000 to present**

# PSP MONITORING PROGRAM

- Shellfish toxicity analysis is the core of monitoring activity
- Done thru Mouse bioassay
- Basis for advisories, regular shellfish bulletins
- Criterion for presence or absence of HAB



# BFAR Monitoring Program

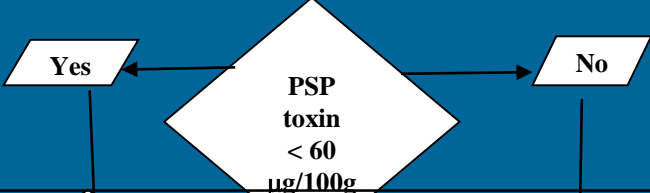
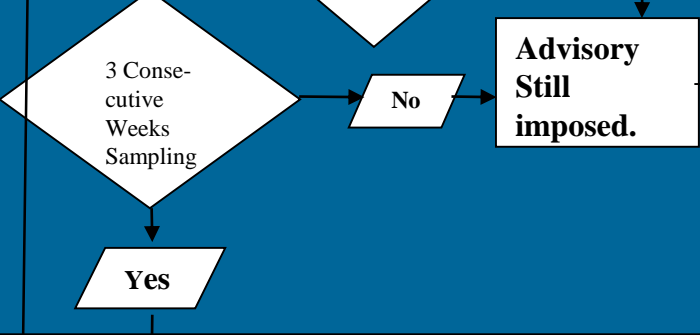
## Procedures for the issuance of shellfish advisory on HAB occurrence in an area or areas

Responsible Office	Activity	Time Frame
BFAR/LGU Biotxin Laboratories	<p>Field Sampling:</p> <ol style="list-style-type: none"> <li>1. Collection of shellfish samples</li> <li>2. Collection of water samples</li> </ol>	One (1) Day
	<p>Laboratory analysis:</p> <ol style="list-style-type: none"> <li>1. determination of shellfish toxicity thru mouse assay</li> <li>2. determination of toxic causative organism thru microscopy</li> </ol>	One (1) day
	<pre> graph TD     A{PSP Toxin &gt; 60 µg/100g} -- Yes --&gt; B[Issuance of Shellfish Advisory that identifies the HAB-affected areas and warns the public of health hazards]     A -- No --&gt; C[Results will be included in the regular shellfish bulletin]           </pre>	Immediately After Analysis
BFAR Director	<p>Issuance of Shellfish Advisory that identifies the HAB-affected areas and warns the public of health hazards</p> <p>Results will be included in the regular shellfish bulletin</p>	Immediately After Release of Results

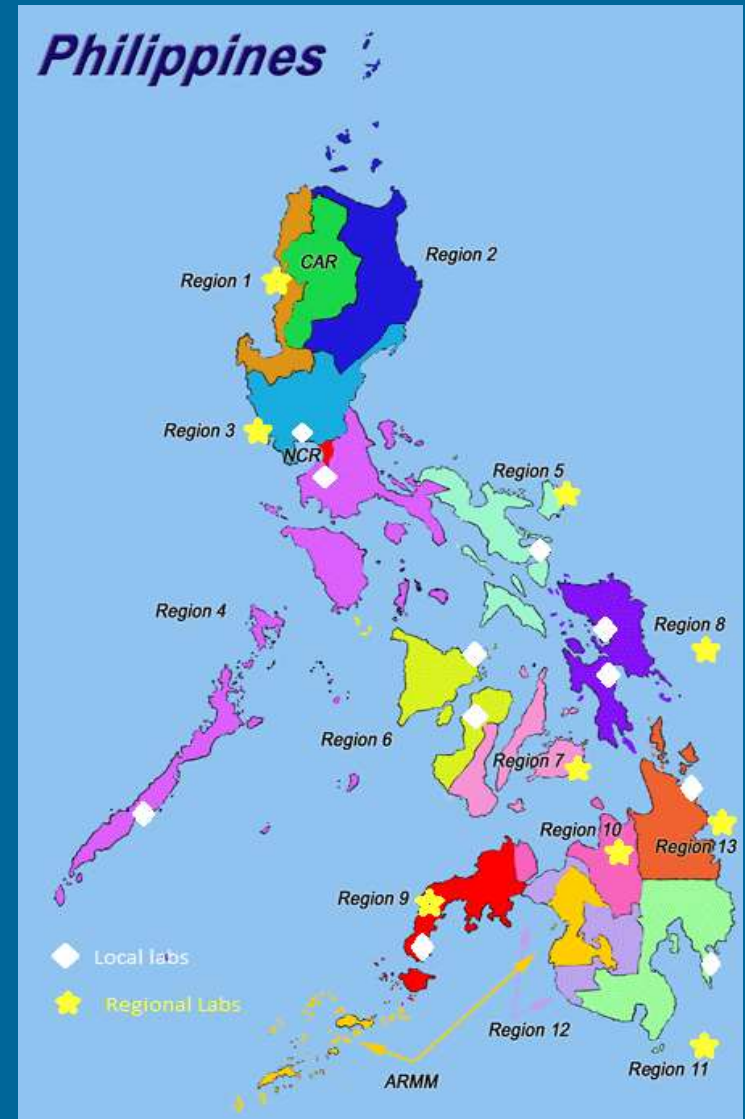
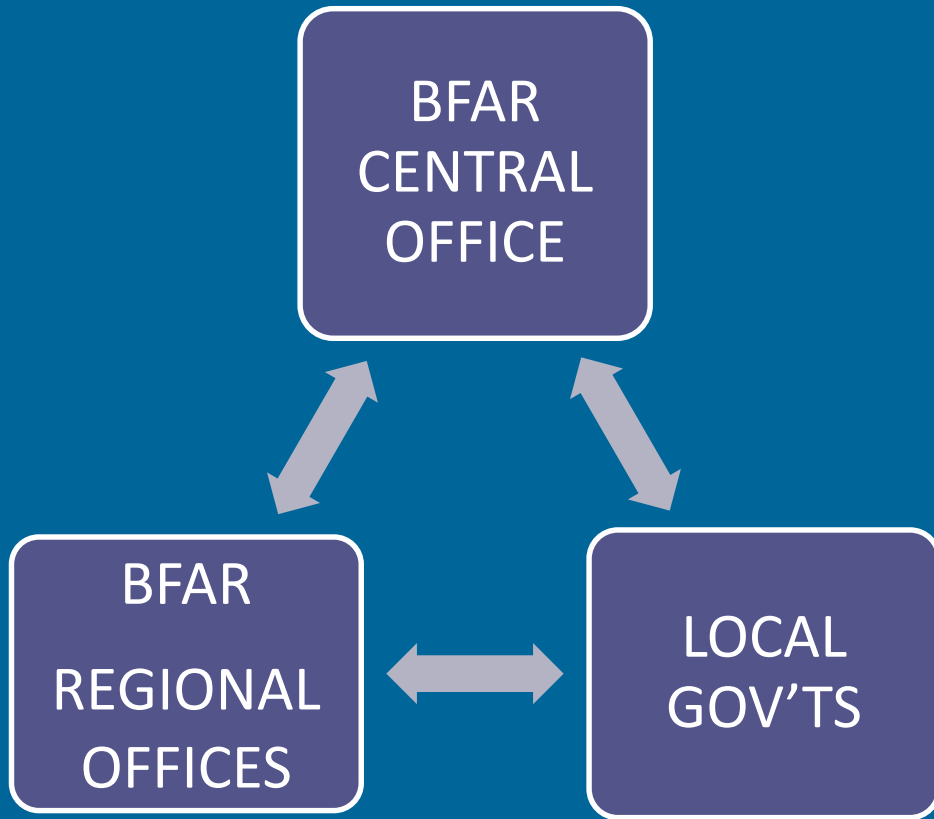


# BFAR Monitoring Program

## Procedures for issuance of shellfish advisory that affected area/s is/are now free of HAB

Responsible Office	Activity	Time Frame
BFAR/LGU Biotxin Laboratories	<p>Field Sampling: 1.Collection of shellfish samples 2.Collection of water samples</p> <p>Laboratory analysis: 1.determination of shellfish toxicity thru mouse assay 2.determination of toxic causative organism thru microscopy</p>	One (1) day
	 <pre> graph TD     A{PSP toxin &lt; 60 µg/100g} -- Yes --&gt; B{3 Consecutive Weeks Sampling}     A -- No --&gt; C[Advisory Still imposed.]     B -- Yes --&gt; D[Issuance of Advisory...]     B -- No --&gt; C     C --&gt; A           </pre>	Immediately After Analysis
	 <pre> graph TD     A{3 Consecutive Weeks Sampling} -- Yes --&gt; B[Issuance of Advisory...]     A -- No --&gt; C[Advisory Still imposed.]     C --&gt; A           </pre>	Immediately After Release of Results
BFAR Director	<p>Issuance of Advisory declaring affected area free from PSP Toxin and area open for shellfish harvesting</p>	

# MARINE BIOTOXINS MONITORING



# **MONITORING ACTIVITIES**

## **Sampling Frequency**

**Manila Bay – Cavite, Navotas, Bulacan and Bataan**

**2x per week**

## **Provincial Areas**

**Once a month during non-red tide monitoring**

**Weekly during PSP occurrences**



Field Survey



Sample Analysis

Toxin > 60 µg/100g ?

Bulletin and Advisory for **Positive** area  
Bulletin and Advisory for **Negative** area

Scheduled Bulletin

FAO 235 series 2010

Results Evaluation

Philippine Harmful Algal Bloom and Marine Toxin Monitoring



Archiving

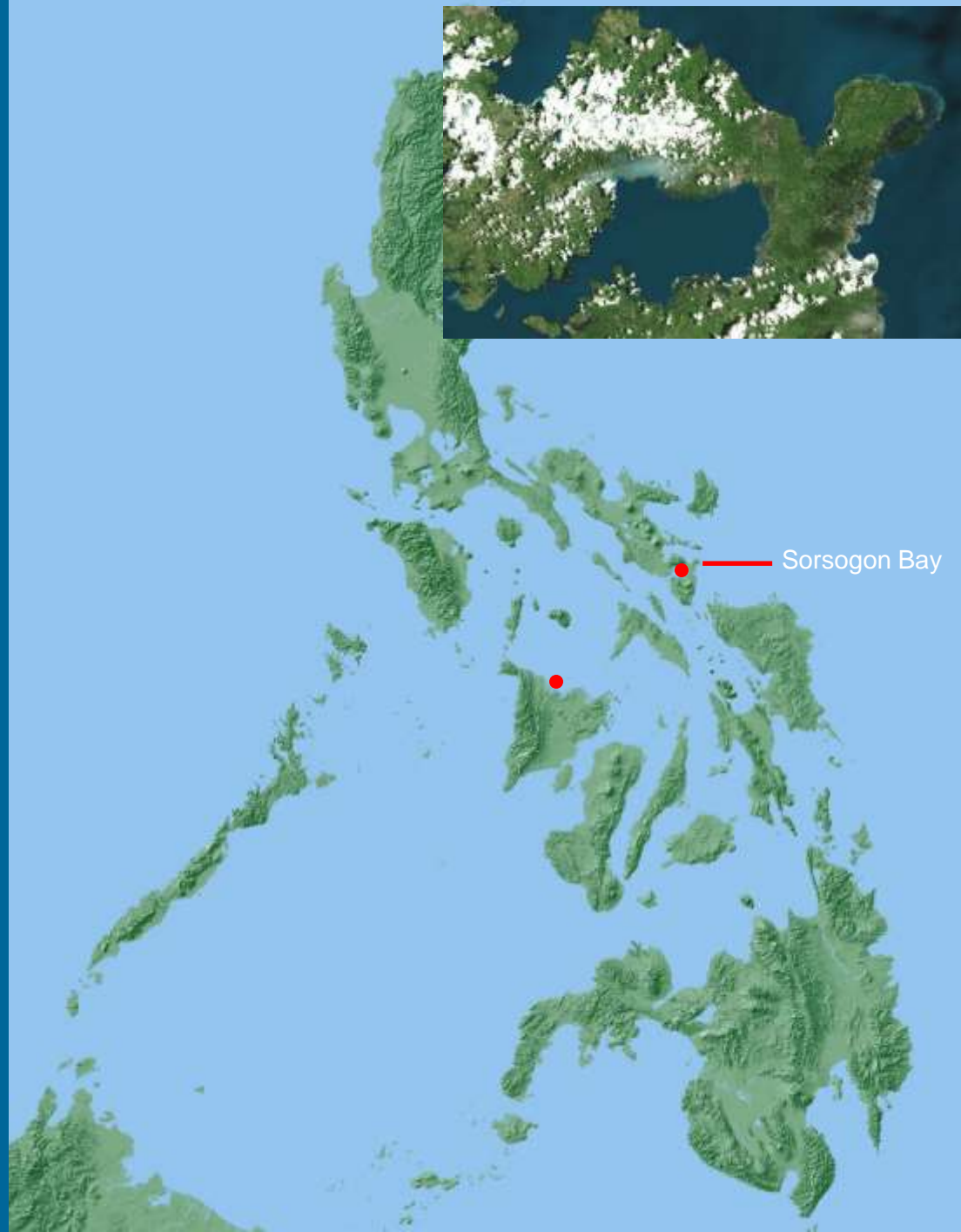


Information Dissemination

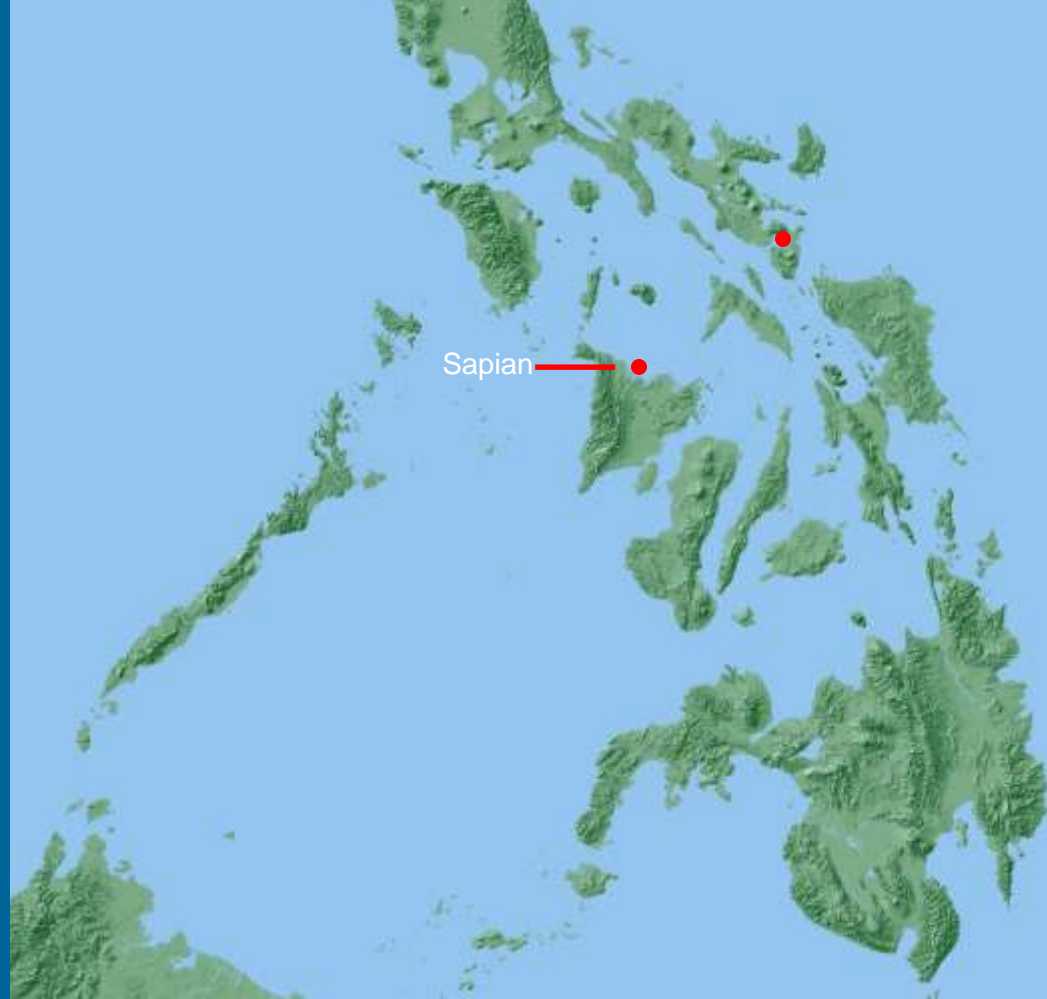
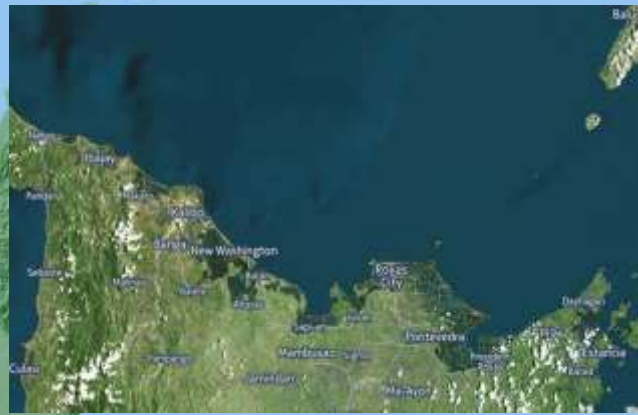


Bulletins and Advisories





Sorsogon Bay



Sapan

12°N 58' 14", 124°E 01' 02"  
12°N 57' 10", 124°E 00' 55"  
12°N 57' 05", 124°E 01' 07"  
12°N 56' 37", 124°E 01' 23"  
12°N 56' 22", 124°E 01' 21"  
12°N 57' 01", 124°E 00' 09"  
12°N 57' 00", 124°E 00' 13"  
12°N 56' 21", 124°E 01' 33"  
12°N 56' 24", 124°E 01' 42"  
12°N 56' 14", 124°E 01' 47"  
12°N 55' 45", 124°E 00' 56"  
12°N 55' 49", 124°E 00' 45"  
12°N 55' 55", 124°E 00' 29"  
12°N 56' 21", 123°E 59' 41"  
12°N 56' 23", 123°E 59' 37"  
12°N 56' 26", 123°E 59' 31"  
12°N 56' 45", 123°E 59' 35"  
Cambulaga, Sorsogon  
Pier, Sorsogon  
Waray Dahon, Sorsogon City  
Casiguran, Sorsogon City





12°N 58' 14", 124°E 01' 02"

12°N 57' 10", 124°E 00' 55"

12°N 57' 05", 124°E 01' 07"

12°N 56' 37", 124°E 01' 23"

12°N 56' 22", 124°E 01' 21"

12°N 57' 01", 124°E 00' 09"

12°N 57' 00", 124°E 00' 13"

12°N 56' 21", 124°E 01' 33"

12°N 56' 24", 124°E 01' 42"

12°N 56' 14", 124°E 01' 47"

12°N 55' 45", 124°E 00' 56"

12°N 55' 49", 124°E 00' 45"

12°N 55' 55", 124°E 00' 29"

12°N 56' 21", 123°E 59' 41"

12°N 56' 23", 123°E 59' 37"

12°N 56' 26", 123°E 59' 31"

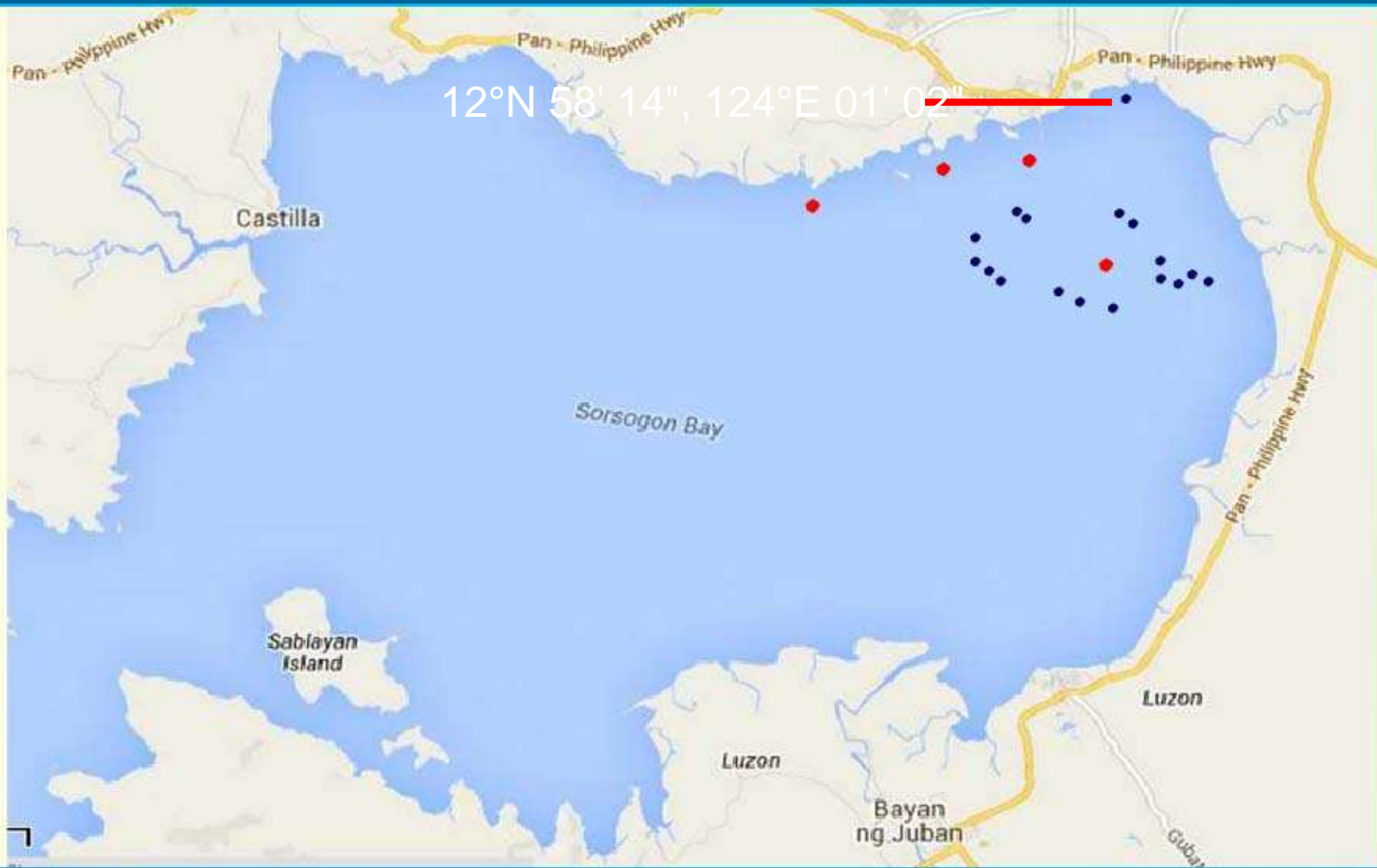
12°N 56' 45", 123°E 59' 35"

Cambulaga, Sorsogon

Pier, Sorsogon

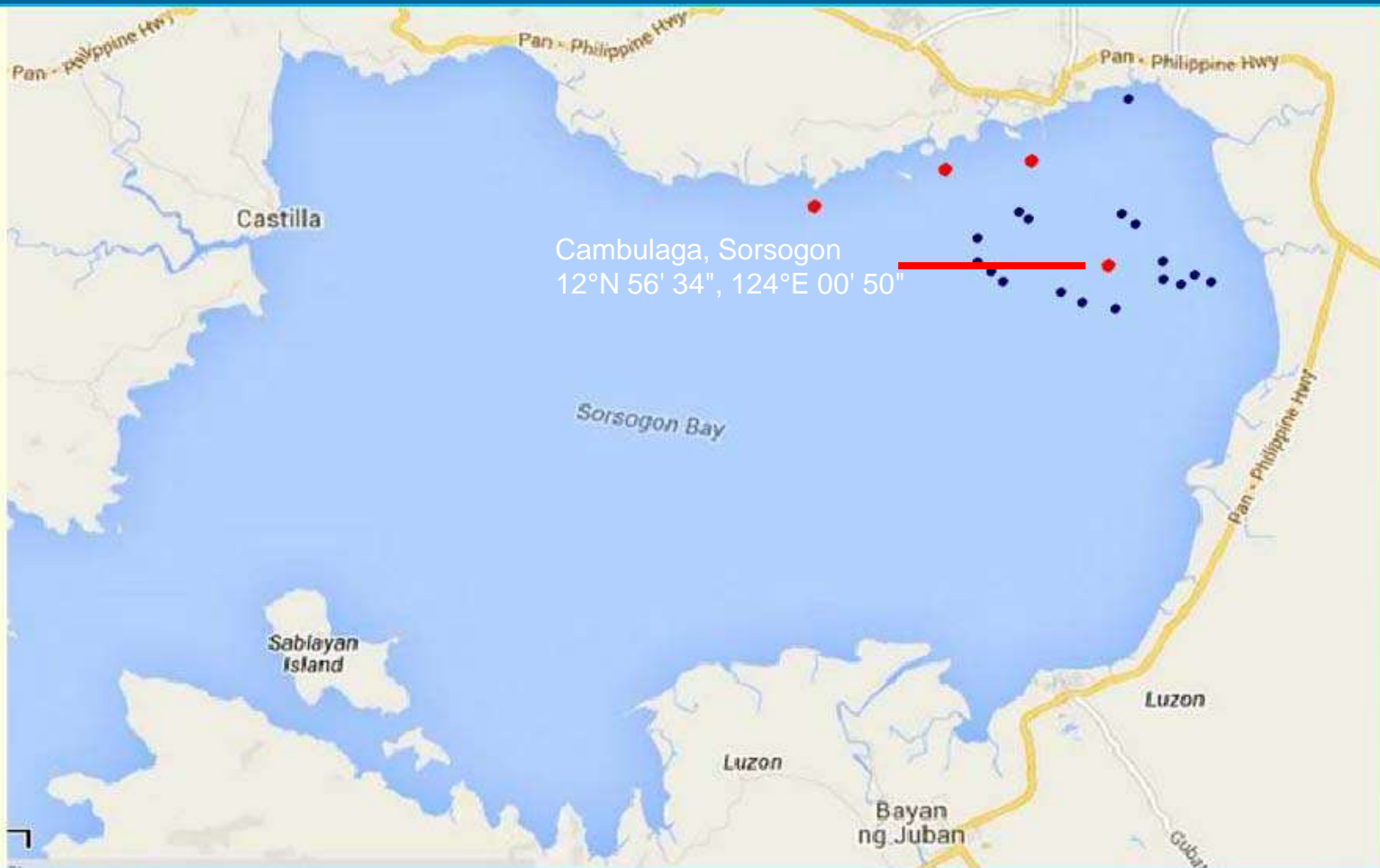
Waray Dahon, Sorsogon City

Casiguran, Sorsogon City

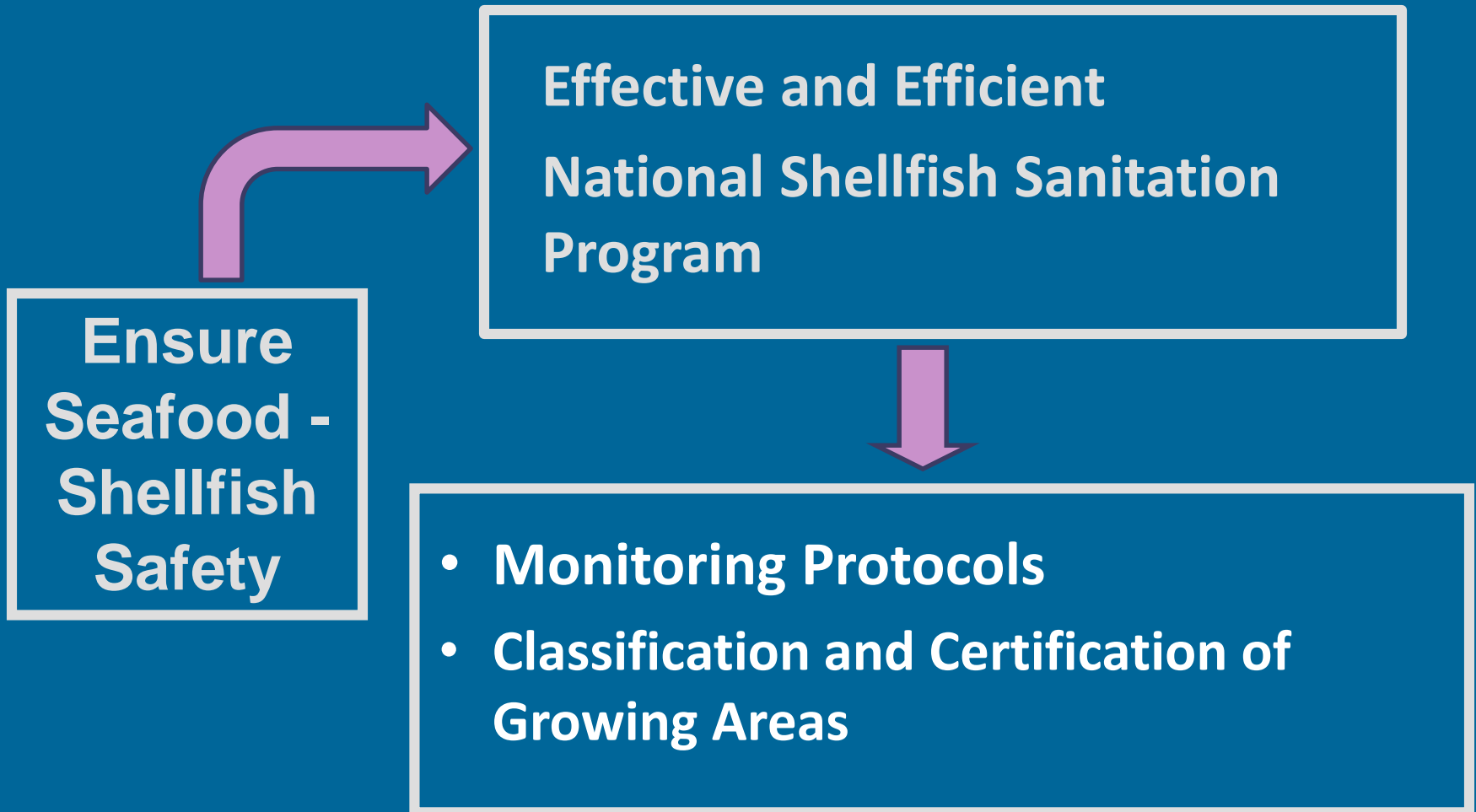


12°N 58' 14", 124°E 01' 02"  
12°N 57' 10", 124°E 00' 55"  
12°N 57' 05", 124°E 01' 07"  
12°N 56' 37", 124°E 01' 23"  
12°N 56' 22", 124°E 01' 21"  
12°N 57' 01", 124°E 00' 09"  
12°N 57' 00", 124°E 00' 13"  
12°N 56' 21", 124°E 01' 33"  
12°N 56' 24", 124°E 01' 42"  
12°N 56' 14", 124°E 01' 47"  
12°N 55' 45", 124°E 00' 56"  
12°N 55' 49", 124°E 00' 45"  
12°N 55' 55", 124°E 00' 29"  
12°N 56' 21", 123°E 59' 41"  
12°N 56' 23", 123°E 59' 37"  
12°N 56' 26", 123°E 59' 31"  
12°N 56' 45", 123°E 59' 35"

Cambulaga, Sorsogon  
Pier, Sorsogon  
Waray Dahon, Sorsogon City  
Casiguran, Sorsogon City



# CURRENT ACTIVITY



# NATIONAL SHELLFISH SANITATION PROGRAM

- Based on national legislation
- Compliant with best international food safety standards and code of practice
- Ensure safe Philippine shellfish, and
- Maintain sustainable shellfish industry

# NATIONAL SHELLFISH SANITATION PROGRAM

- Classification and certification of live shellfish growing areas
- Monitoring for faecal coliforms and/or *Escherichia coli* in shellfish mollusc flesh and intravalvular fluid
- Monitoring of shellfish growing areas for the occurrence of harmful algal blooms

# FUTURE PLANS

Improved Analysis for OA  
DTX and CFP

Use of screening techniques  
PSP, ASP and DSP detection  
at the laboratories in the  
regional and local levels

Marine Bitoxin  
Monitoring

Philippine Regulatory limit  
for the other marine toxins

Establish baseline data for  
PbTX and AZP