HAB data management in Japan
and
inherent difficulty in joining to the PICES database

Yasuwo FUKUYO, Satoru TODA,
Shigeru ITAKURA, Ichiro IMAI
and Masaaki KODAMA

Basic standpoint to the PICES database

Japan understands the importance and usefulness of databases such as HAE-DAT of IOC for HAB study and management.

But there are several problems, maybe exclusively in Japan, that make provision of data to the database difficult.

Such difficulty comes mostly from nature of HAB monitoring and management system in Japan, *i.e.*, too many data on red tides and toxic contamination problems which are collected by many (>40) mandatory organizations. All reports are written in Japanese for Japanese people.

Translation of the data is impossible by limitation of budget and time. (not reasonable in view of cost vs. benefit)

Therefore Japan thinks it is impossible for the moment to input data from Japan to the PICES database.

Varieties of HABs Monitorings in Japan

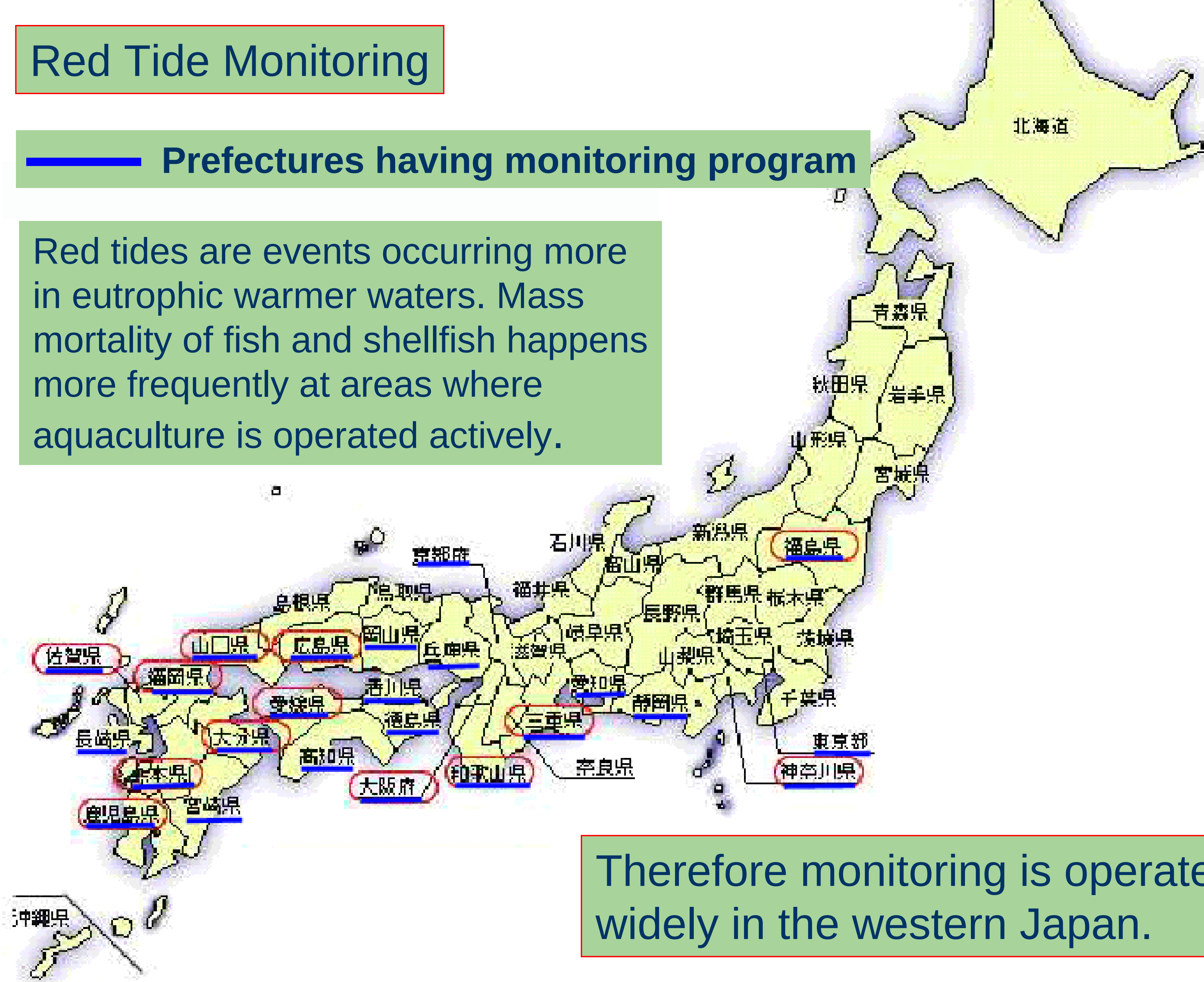
A. Monitoring by mandatory organizations
(Results are published regularly through paper and/or E-media)
1. Red Tides
1-1. Regular oceanographic survey in frequent outbreak area during high risk season, including non occurring time of red tide.
1-2. Emergency oceanographic survey at red tide occurrence
2. Toxic plankton blooms
2-1. Regular toxicity monitoring in fish and shellfish, and oceanographic condition observation

B. Monitoring by research organizations such as a university
(Results are published irregularly, mostly in a scientific journal)
Monitoring on plankton, shellfish toxicity and/or oceanographic data for research purposes such as elucidation of blooming and spreading mechanisms

Red Tide Monitoring

Prefectures having monitoring program

Red tides are events occurring more in eutrophic warmer waters. Mass mortality of fish and shellfish happens more frequently at areas where aquaculture is operated actively.



Therefore monitoring is operated widely in the western Japan.

Red tide monitoring: oceanographic survey (case of Ohita Pref,)

表1．調査定点の緯度・経度

St	北　緯	東　経
1	33° 39′	131° 12′
2	33° 37′	131° 18′
3	33° 36′	131° 22′
4	33° 36′	131° 25′
5	33° 38′	131° 28′
6	33° 47′	131° 22′

6 research stations

（2）　調査時期と調査項目

調査時期と調査項目は表2のとおりである。

Researches in May – Sept.

表2．一般調査時期と調査項目

調査月日	調査項目			
	気　象	海　象	水　質	プランクトン
5月　9日	○	○	○	○
5月31日	○	○	○	○
6月　7日	○	○	○	○
6月23日	○	○	○	○
7月　5日	○	○	○	○
7月19日	○	○	○	○
8月　2日	○	○	○	○
8月17日	○	○	○	○
9月　2日	○	○	○	○
9月19日	○	○	○	○

（3）　調査内容

各調査項目の内容、及び、観測層などは表3のとおりである。

表3．一般調査の内容

調査項目	調　査　内　容	観　測　層
気　象	天候，雲量，風向，風力	
海　象	水温，塩分，透明度，水色	
水　質	DO，NH₄−N，NO₂−N，NO₃−N PO₄−P，クロロフィル−a	0.5，10，B-1m
プランクトン	採水プランクトン出現種，細胞数	0，10m

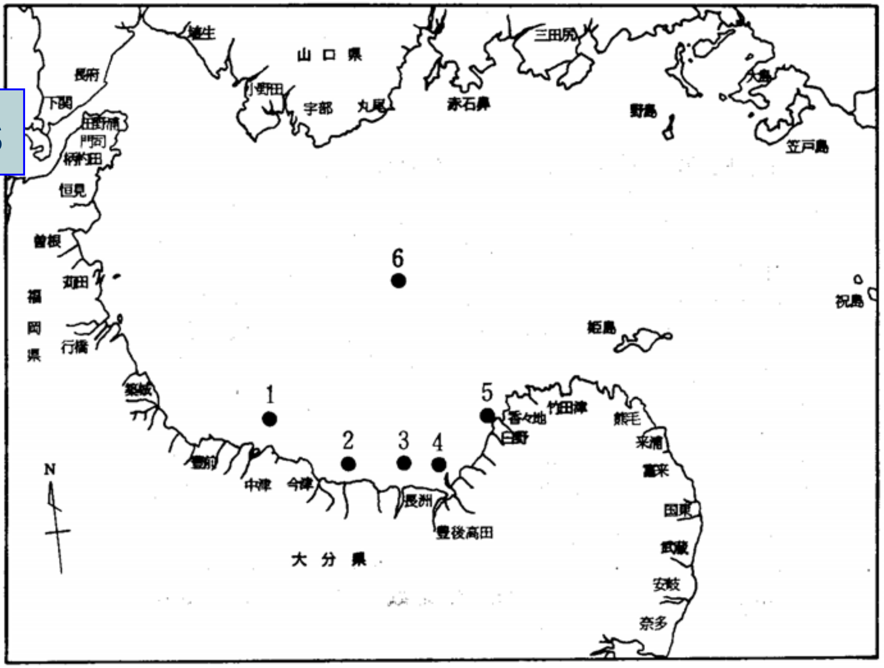


図1．調　査　定　点

Research (10 times/ year)

Climate: weather, cloud, wind (strength and direction)

Oceanographic condition:

physical: temp., sal., transparency, color

chemical: DO, NH_4-N, NO_2-N, NO_3-N, PO_4-P, chl-*a*

biological: quantitative analysis of plankton collected by bottle

Red tide monitoring: oceanographic survey (case of Ohita Pref,)

Researches are conducted in May – Sept.,
because these are frequent months of red tide occurrence.

表４．月別赤潮発生件数（延べ件数）

year / month / total

	年＼月	1	2	3	4	5	6	7	8	9	10	11	12	合計
	昭和53						2					1		3
	54							2	1	1	1	1		6
1980	55								2	2				4
	56											1		1
	57							2						2
	58										1			1
	59							1						1
1985	60							1	1			1		3
	61							2	1					3
	62											1		1
	63								1					1
	平成1					1			1					2
1990	2													0
	3								1					1
	4													0
	5									1	1			2
	6										1	1		2
	合計					1	2	8	8	4	4	6		33

Red tide monitoring: oceanographic survey (case of Ohita Pref,)

Climate

physical oceanogr.

気象海況観測結果　　　　平成 6年 5月 9日

St.	緯度	経度	観測時刻	天候	雲量	風向	風力	水深 m	透明度 m	水色	観測層 m	WT ℃	S ‰	DO mℓ/ℓ	DO %
1	33°39'	131°12'	10:56	B	2	NNE	2	12	5.0	49	0	[illegible]	[illegible]	[illegible]	[illegible]
											5	[illegible]	[illegible]	[illegible]	[illegible]
											B	15.0	32.21	5.61	97.0
2	33°37'	131°18'	10:32	B	2	NNE	2	10	4.0	48	0	17.4	31.61	5.82	105.1
											5	16.6	31.91	5.91	105.3
											B	15.6	32.00	5.75	100.5
3	33°36'	131°22'	9:53	B	2	N	1	13	6.0	57	0	17.1	31.72	5.90	106.0
											5	16.5	31.96	5.90	104.9
											10	—	—	—	—
											B	15.6	31.98	5.60	97.8
4	33°36'	131°25'	9:27	B	2	N	1	11	4.0	49	0	17.4	31.33	5.70	102.8
											5	16.1	31.75	5.92	104.3
											B	15.6	31.93	5.22	91.2
5	33°38'	131°28'	14:28	B	2	NE	2	10	5.0	49	0	17.7	31.56	5.96	108.2
											5	16.3	31.74	5.95	105.2
											B	15.3	32.18	5.58	97.0
6	33°47'	131°22'	12:35	B	2	NE	2	20	7.0	58	0	16.5	32.35	6.10	108.7
											5	15.7	32.40	6.10	107.1
											10	15.0	32.42	5.81	100.5
											B	13.2	32.88	5.35	89.5

Red tide monitoring: oceanographic survey (case of Ohita Pref,)

水 質 底 質 分 析 結

chemical oceanogr.

平成 6年 5月 9日

St.	観測層 m	HN_4-N μmol／ℓ	NO_2-N μmol／ℓ	NO_3-N μmol／ℓ	PO_4-P μmol／ℓ	D I N μmol／ℓ	クロロフィル-a μg／ℓ
1	0	tr	0.04	0.19	0.03	0.23	2.17
	5	0.08	0.03	0.19	0.03	0.30	2.45
	B	0.09	0.04	0.06	0.03	0.19	3.74
2	0	0.29	0.03	0.19	0.05	0.51	2.67
	5	0.18	0.03	0.24	0.05	0.45	2.49
	B	0.45	0.04	0.22	0.07	0.71	3.75
3	0	0.62	0.06	0.34	0.04	1.02	1.41
	5	0.08	0.05	0.24	0.04	0.37	1.84
	10	—	—	—	—	—	—
	B	0.21	0.05	0.23	0.06	0.49	2.41
4	0	0.43	0.05	0.16	0.07	0.64	3.19
	5	0.17	0.06	0.23	0.06	0.46	4.45
	B	1.05	0.07	0.59	0.08	1.71	2.99
5	0	0.02	0.03	0.13	0.04	0.18	1.83
	5	0.19	0.04	0.22	0.04	0.45	2.86
	B	tr	0.05	0.26	0.08	0.31	4.55
6	0	0.24	0.03	0.15	0.05	0.42	1.26
	5	0.09	0.04	0.13	0.04	0.26	1.76
	10	0.28	0.06	0.35	0.06	0.69	1.70
	B	0.63	0.10	0.17	0.18	0.90	7.16

Red tide monitoring: oceanographic survey (case of Ohita Pref,)

biological oceanogr.

採水プランクトン調査結果表 （平成6年5月9日）

種　名 ＼ st.No	1−0	1−B	3−0	3−B	5−0	5−B	6−0	6−10	2−0	2−B	4−0	4−B
● Skeletonema costatum									10	10	20	
Leptocylindrus danicus									100	30	40	
● Gymnodinium sp.	40	10		10	30	10			20	50		50
● Ceratium fusus								50				
● C. furca			60									
● Heterosigma akashiwo							60		80		50	
小型鞭毛藻	100	80	80	250	280	180	250	150	180	80	100	130
繊毛虫類	60	50	100	150	160	80	60	300	300	100	300	100
Coscinodiscus sp.		50								40		
合　計	200	190	240	410	470	270	370	500	690	310	510	280

採水プランクトン調査結果表 （平成6年5月31日）

種　名 ＼ st.No	1−0	1−B	3−0	3−B	5−0	5−B	6−0	6−10	2−0	2−B	4−0	4−B
● Skeletonema costatum									10	10	10	
Leptocylindrus danicus									70	30	30	
Navicula sp.			10						10	10		
Dictyocha fibra		10		20	40	20		20	30	40		20
● Prorocentrum triestinium									10			
● Gymnodinium sp.	30	10		10	30	20			30	20		20
● Ceratium fusus								30				
C. sp.			10									
● Heterosigma akashiwo	10	10					30		50		20	
● Chattonella spp.				20		10						
小型鞭毛藻	150	140	40	200	240	120	180	130	150	60	80	120
繊毛虫類	70	40	60	100	110	60	50	250	310	50	280	190
Coscinodiscus sp.		10								10		
Rhizosolenia delicatula						sp20	sp20		sp10	sp10		
● Mesodinium sp.					10	20	20		10			
Codonellopsis morchella	10											
Distephanus sp.			10									
合　計	270	220	130	350	430	270	300	430	690	240	420	350

●: species having records of red tides

Previous slides shows a part of data collected by a prefecture 10 time a year at 3-4 depths of 6 stations: 180 set of data containing 4 climate and 4 physical, 6 chemical and many biological oceanographic data per one data

In Japan more than 25 local governments make this kind of monitoring. Therefore ca.180x25 = 4500 data set are available every year.

These data are usually published in the following year as an official report of red tide monitoring.

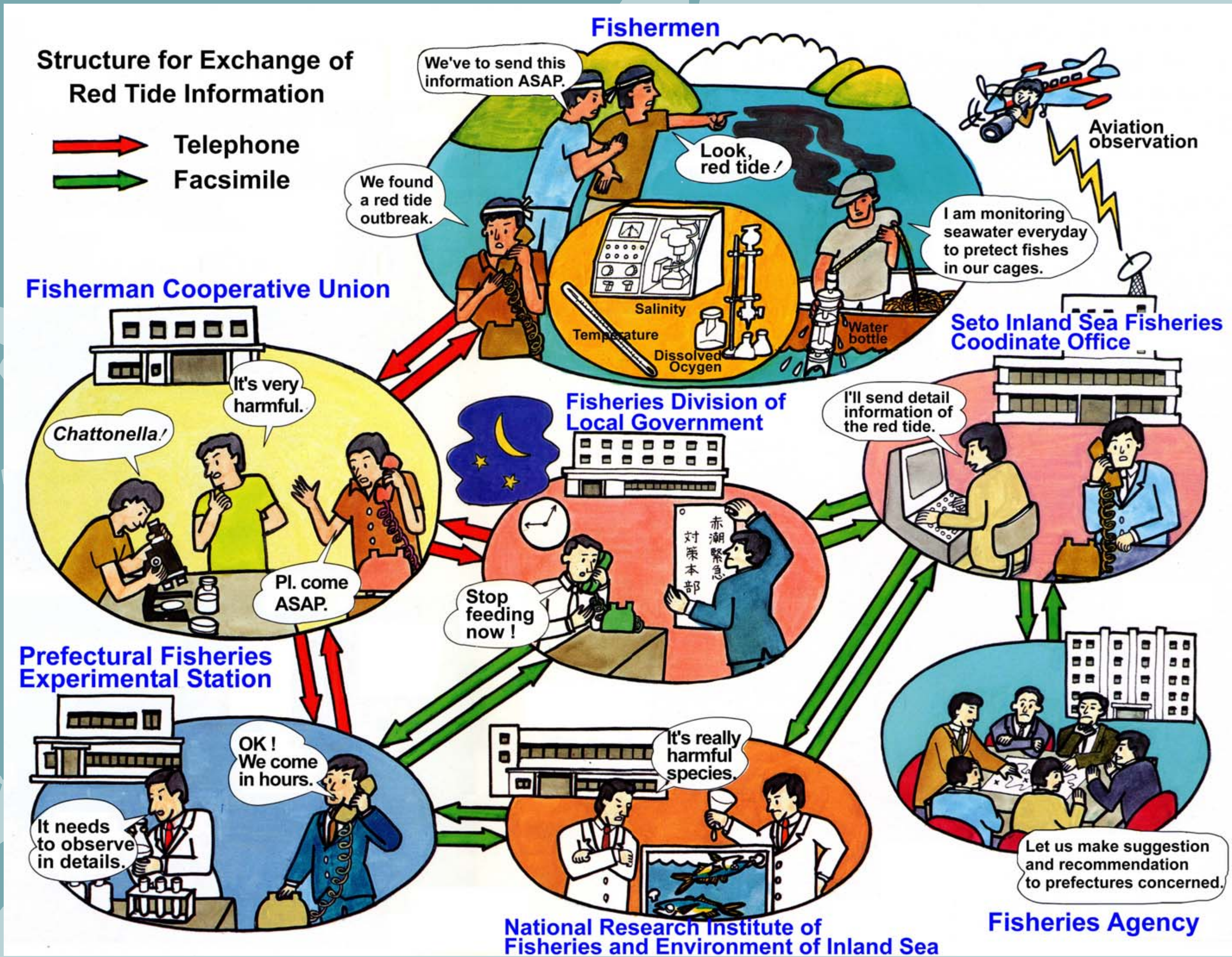
Some of the data are collected during occurrence of red tides including harmful ones, but most of them are taken at non-occurring time of red tide.

Questions: Should we input all the data to the PICES database? , and who do the work? by what budget?

In addition to the regular monitoring, there are many cases of emergency red tide survey. These are really red tide events monitoring, but only 10% of them are harmful events, *i.e*. HAEs.

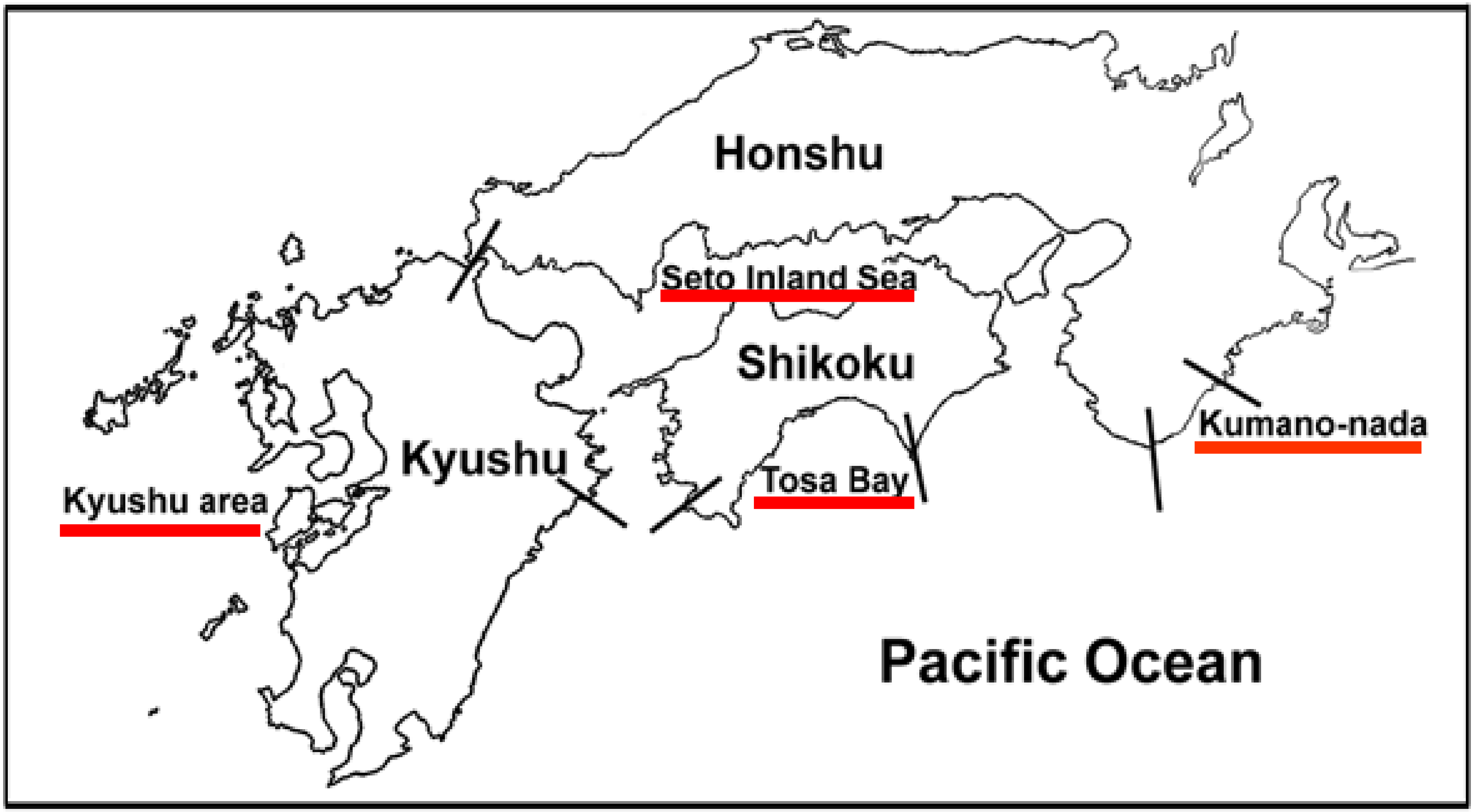
Data of monitoring on these HAEs are not consistent in terms of sampling stations, depth, items etc. Moreover many of the data are not properly published.

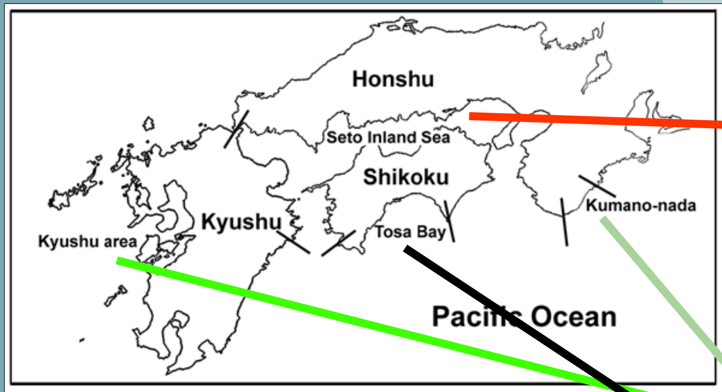
Some of them can be seen in summarized format in publication and also homepages of prefecutures.

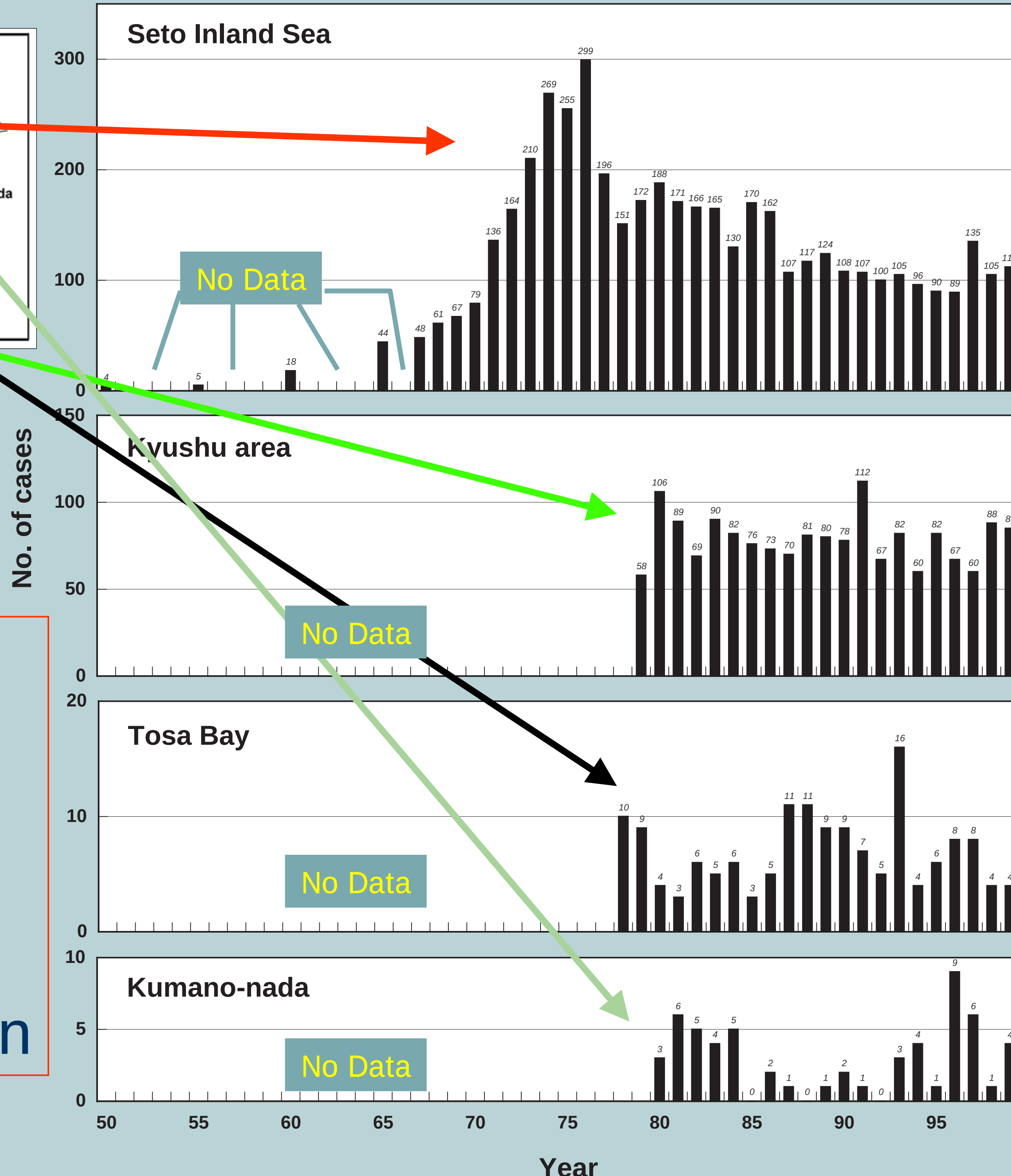


Structure for Exchange of Red Tide Information
Telephone
Facsimile
Fishermen
We've to send this information ASAP.
Look, red tide!
We found a red tide outbreak.
I am monitoring seawater everyday to pretect fishes in our cages.
Salinity
Temperature
Dissolved Ocygen
Water bottle
Aviation observation
Fisherman Cooperative Union
It's very harmful.
Chattonella!
Pl. come ASAP.
Fisheries Division of Local Government
赤潮緊急対策本部
Stop feeding now !
Seto Inland Sea Fisheries Coodinate Office
I'll send detail information of the red tide.
Prefectural Fisheries Experimental Station
OK ! We come in hours.
It needs to observe in details.
It's really harmful species.
National Research Institute of Fisheries and Environment of Inland Sea
Let us make suggestion and recommendation to prefectures concerned.
Fisheries Agency

Areas with intensive observation of red tide occurrences

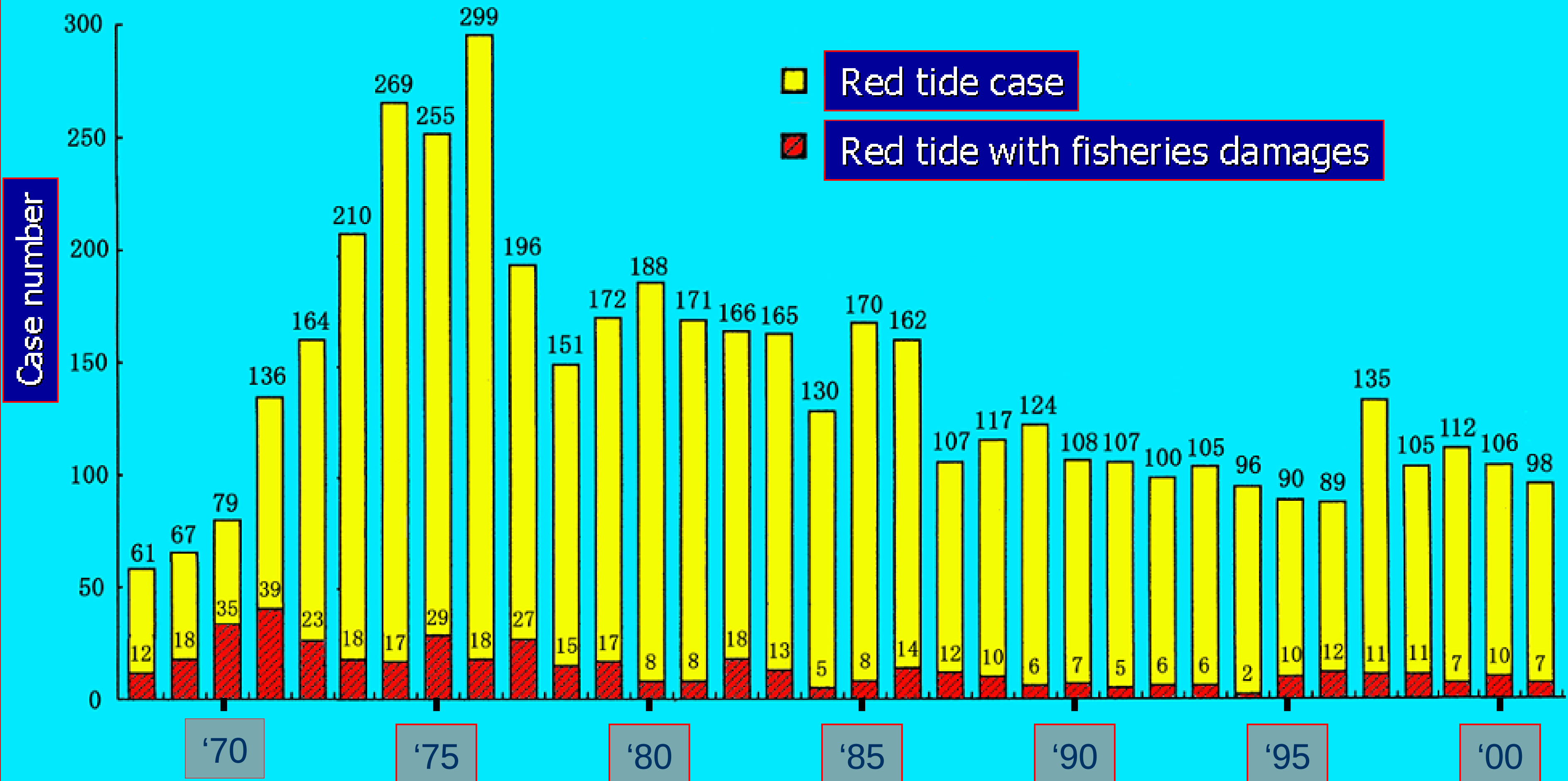






In total about 200 red tide cases are observed annually in the last decade in the four areas of the western Japan

Red tide case number in Seto Inland Sea, Japan



Recently ca. 10% of red tides are harmful. Others are harmless to fisheries industry,

平成4年　（千円）（個/ml）（Km²）

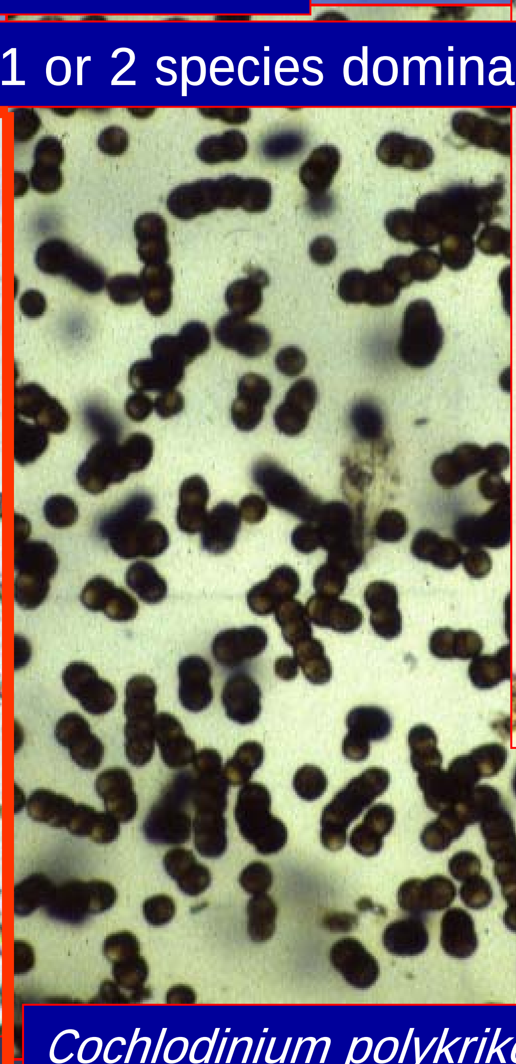
番号	灘名	府県名	発生	収束	期間	赤潮種1	赤潮種2	赤潮種3	被害	被害金額（千円）	最高細胞数（個/ml）	最大面積（Km²）
1	紀伊水道	高知県	1992.04.17	1992.04.17	1	Noc.sp.			無		1,260	0.600
2	紀伊水道	徳島県	1992.05.06	1992.05.08	3	Noc.s			無			1.000
3	紀伊水道	徳島県	1992.05.14	1992.05.16	3	Gym.sa			無			1.000
4	紀伊水道	徳島県	1992.05.18	1992.05.18	1	Het.a			無		50	1.000
5	紀伊水道	徳島県	1992.05.23	1992.05.25	3	Het.a			有		147,150	1.000
6	紀伊水道	徳島県	1992.05.26	1992.05.27	2	Het.a			無		298,000	1.000
7	紀伊水道	徳島県	1992.06.01	1992.06.01	1	Het.a			無		15,000	1.000
8	紀伊水道	徳島県	1992.06.02	1992.06.02	1	Het.a	Pr.d		無		3,750	10.000
9	紀伊水道	徳島県	1992.06.10	1992.06.10	1	Het.a			無		63,725	20.000
10	紀伊水道	徳島県	1992.07.01	1992.07.04	4	Het.a			無			1.000
11	紀伊水道	徳島県	1992.07.03	1992.07.04	2	Gym.sp.	Prm.sp.	Pr.mic	無		42,100	1.000

How many species can we find in red tide water ?

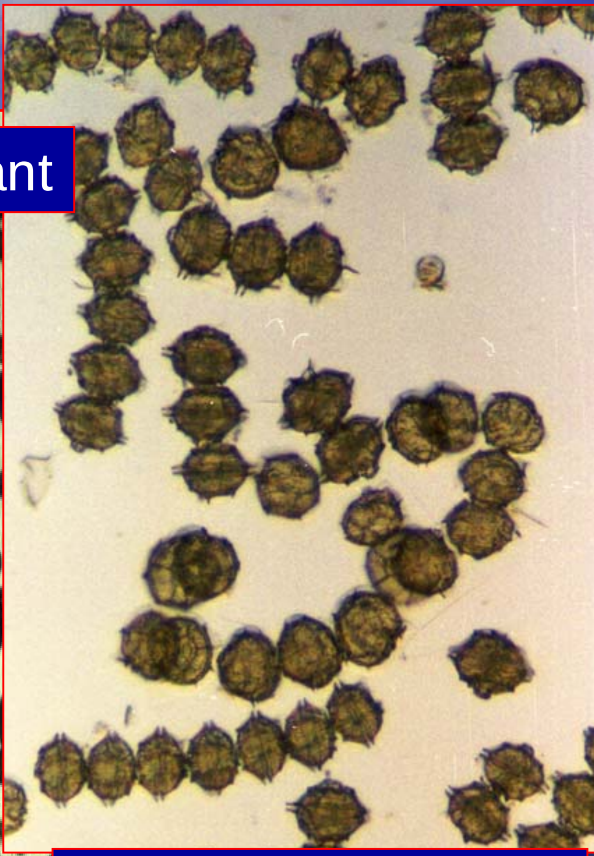
Usually more than 50 different species can be found

Red Tide

1 or 2 species dominant



Cochlodinium polykrikoides



Pyrodinium bahamense

Number of causative species of red tides

Among 140 cases of red tides in 1964-1970

Dominance (>95%) by one species: 97 cases (69%)

Two species

One species 95-75%, the other 25-1%: 25 cases

Each species occupied 75-25%: 18 cases

(Adachi 1972)

Among 1020 cases of red tides in 1992-2000

Dominance by one species: 803 cases (79%)

Dominance by two species: 165 cases (16%)

Dominance by three species: 52 cases (5%)

(Seto Inland Sea Fisheries Coordination Office, 1993-2001)

One species forms red tides in most of cases, but plural species sometimes form them.

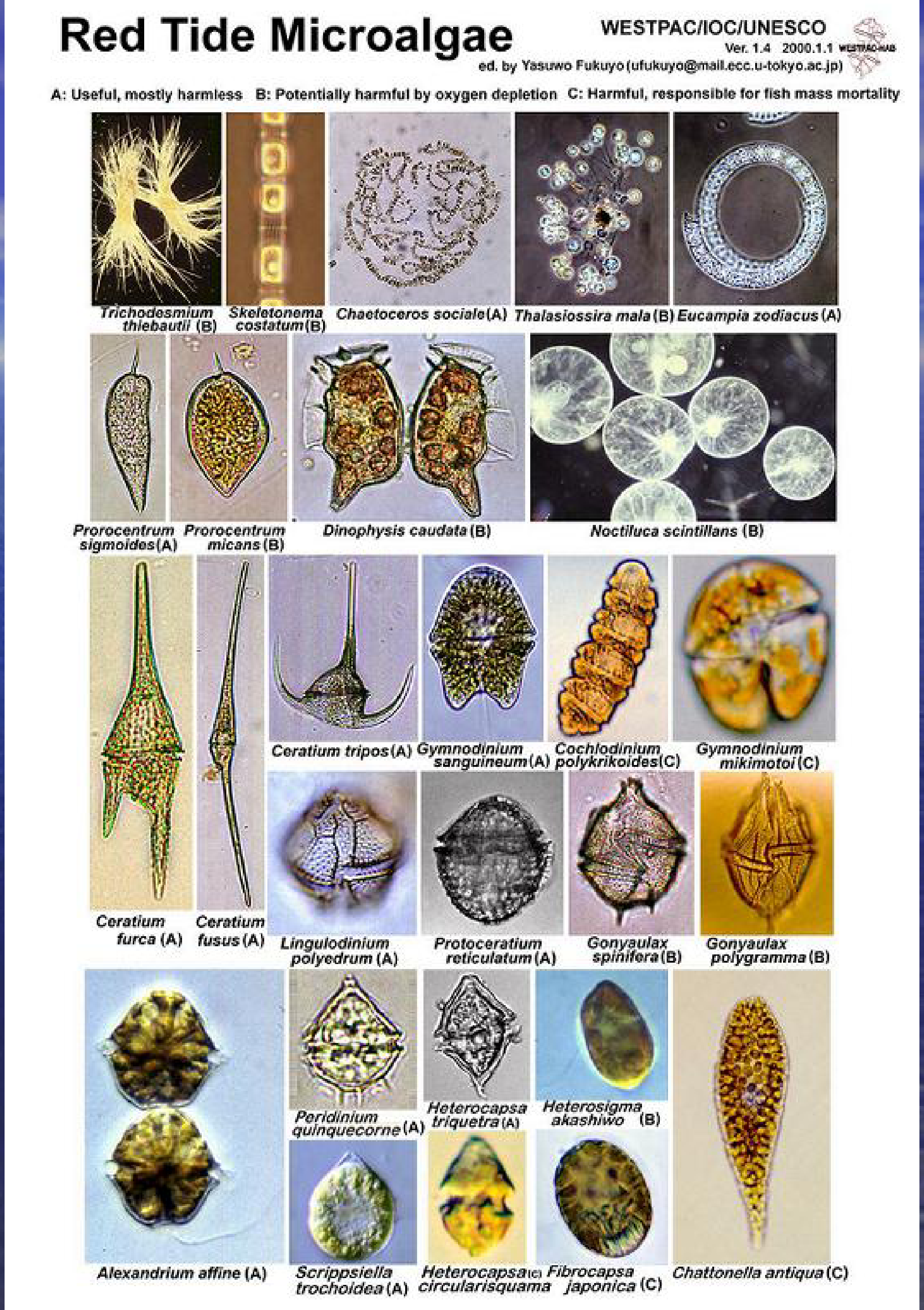
How many causative species can we count ?

Adachi 1972: 41 species

Seto Inland Sea
Coordination Office
1992-2000: 46 spec

Fukuyo 1992: 48 species
of dinoflagellates

Number of causative species must be more than 80.



Frequent causative organisms (genus) and red tide case number in western Japan in 1992-2000

Genus names	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total
Noctiluca	31	39	25	18	25	30	24	16	29	237
Gymnodinium	17	10	15	23	32	23	6	8	18	152
Heterosigma	22	22	19	14	12	17	16	15	14	151
Mesodinium	3	6	4	6	3	29	11	18	6	86
Skeletonema	5	10	6	10	8	8	13	9	10	79
Prorocentrum	8	8	5	7	4	13	4	16	9	74
Gonyaulax	0	7	4	3	0	1	15	2	1	33
Chaetoceros	1	3	4	2	4	4	4	2	6	30
Chattonella	3	3	1	3	0	5	2	7	3	27
Thalassiosira	2	0	6	1	2	0	1	6	4	22
Heterocapsa	1	1	0	1	1	4	4	5	1	18
Alexandrium	2	0	2	3	0	2	0	5	0	14
Leptocylindrus	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	4	14
Pseudo-Nitzschia	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	0	13
Ceratium	1	1	0	1	6	3	0	0	0	12

dinoflagellates 562/1011

Higher and smaller cell number (cells/ml) in a red tide water (among 762 cases)

Het.a: Heterosigma akashiwo
Pr.d: Prorocentrum "dentatum"
Kar.m: Karenia mikimotoi
Gon.ma: Gonyaulax polygramma

Ak. sa: Akashiwo sanguinea
Noc. s: Noctiluca scintillans
C.a: Chattonella amtiqua
Cos. sp.: *Coscinodiscus* sp.

High number

Het.a	476,700
Het.a	390,000
Het.a	300,000
Het.a	298,000
Het.a	298,000
Het.a	258,000
diatom	240,000
Pr.d	209,000
Kar.m	160,000
Gon.ma	158,500
Het.a	153,000
Het.a	147,150
Het.a	135,000
Het.a	130,000
Het.a	128,000
Het.a	120,000

Lower number

Ak.sa	112
Noc.s	100
Noc.s	100
Noc.s	100
Noc.s	100
Noc.s	100
C.a	95
Noc.s	75
Noc.s	75
Noc.s	75
Het.a	50
Noc.s	50
C.a	50
Coc. sp.	26
Noc.s	24
Noc.s	20
Noc.s	10

coverage of area (km^2) of red tide (among 455 cases)

>1,000 km^2:	4 cases
> 800	: 3
> 600	: 14
> 400	: 18
> 200	: 53
> 100	: 43

> 50 :	33
> 10 :	64
> 5 :	36
> 1 :	104
< 1 :	83

A half of RTs is <10 km^2

Ske. c: Skeletonema costatum
Noc. s: Noctiluca scintillans
Lep. d: Leptocylindrus danicus
Gon.ma: Gonyaulax polygramma
Kar. m: Karenia mikimotoi

Mes. r: Mesodinium rubeum
Noc. s: Noctiluca scintillans
C. m: Chattonella marina
Per. q.: Peridinium quinquecorne

Larger RT		Smaller RT	
Ske.c	1,360.0000	*Mes.r*	0.0300
Ske.c	1,288.0000	*Noc.s*	0.0300
Ske.c	1,040.0000	*Noc.s*	0.0200
Ske.c	1,040.0000	*Noc.s*	0.0200
Noc.s	900.0000	*Per.q*	0.0200
Ske.c	890.0000	*Noc.s*	0.0190
Lep.d	828.0000	*Noc.s*	0.0160
Lep.m	750.0000	*Noc.s*	0.0100
Gon.ma	750.0000	*Noc.s*	0.0100
Ske.c	720.0000	*Mes.r*	0.0100
Ske.c	675.0000	*Pr.d*	0.0050
Ske.c	672.0000	*Noc.s*	0.0050
Kar.m	660.0000	*Kar.m*	0.0040
Het.a	650.0000	*Noc.s*	0.0020
Ske.c	644.0000	*C.m*	0.0020
Ske.c	640.0000	*Noc.s*	0.0005

Frequency of red tide duration (among 1020 cases)

A half of Ts is <4 days

RT Days	Case number	Total
1	276	
2	111	
3	74	
4	56	517
5	51	
6	34	
7	40	642
8	49	
9	23	
10	14	728
11	23	
12	16	
13	16	
14	15	
15	25	823

16	13
17	13
18	12
19	14
20	8
21	7
22	20
23	3
24	3
25	6
26	1
27	7
28	3
29	7
30	9

31	3
32	5
33	2
34	1
35	1
36	5
37	3
38	2
39	0
40	4
41	0
42	1
43	2
44	1
45	2

46	1
47	1
48	1
49	1
50	4
51	0
52	2
53	1
54	1
55	1
56	0
57	1
58	2
59	0
60	1

64	1
65	2
69	1
71	1
72	3
76	1
80	1
81	1
85	1
87	1
94	1
97	1
99	1
106	1
Total	5

In order to develop the monitoring technology, biological oceanographers must pass necessary correct information of red tides to scientists working on satellite image analysis.

What is the definition of “red tide” ? water discoloration

What is the color of red tides ? variable

How many species can we find in red tide water ? 1

How many causative species (genus) can we count ? 80

How many red tide number can we observe? 200

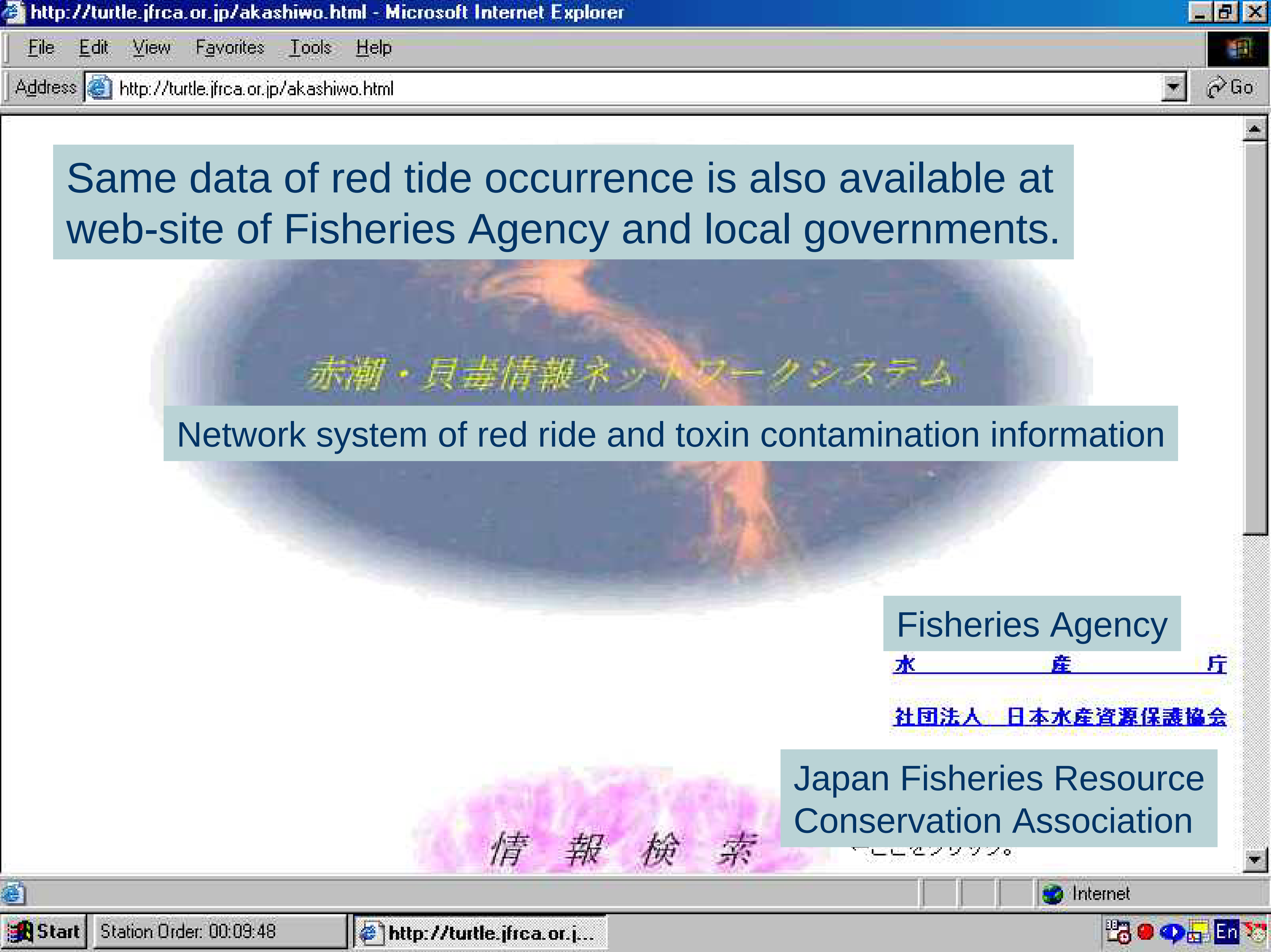
What is the highest cell number in red tide water ?

10 – 47,670 cells/ml

How much area did red tides cover ? 0.0005 – 1,36 km^2

How many days did red tides last ? 1-106 days

Red tide is easy to define, but its actual condition is so variable and difficult to draw typical figure.



http://turtle.jfrca.or.jp/akashiwo.html - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://turtle.jfrca.or.jp/akashiwo.html
Go
Same data of red tide occurrence is also available at web-site of Fisheries Agency and local governments.
赤潮・貝毒情報ネットワークシステム
Network system of red ride and toxin contamination information
Fisheries Agency
水産庁
社団法人　日本水産資源保護協会
Japan Fisheries Resource Conservation Association
情報検索
Internet
Start
Station Order: 00:09:48
http://turtle.jfrca.or.j...

http://turtle.jfrca.or.jp/akashiwo.html - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://turtle.jfrca.or.jp/akashiwo.html

社団法人　日本水産資源保護協会

情　報　検　索　←ここをクリック。

What's New

赤潮・貝毒情報ネットワークとは？
更新履歴

トピックス

新型赤潮生物ヘテロカプサについて（瀬戸内水研のＨＰへのリンク）

都道府県による速報

赤潮発生に関する速報
貝毒による出荷規制に関する速報

Red tide

Toxic plankton bloom

プランクトン図鑑

渦鞭毛藻図鑑（東京大学 アジア生物資源環境研究センター）
藻類画像データ（筑波大学 生物科学系 植物系統・分類研究室）

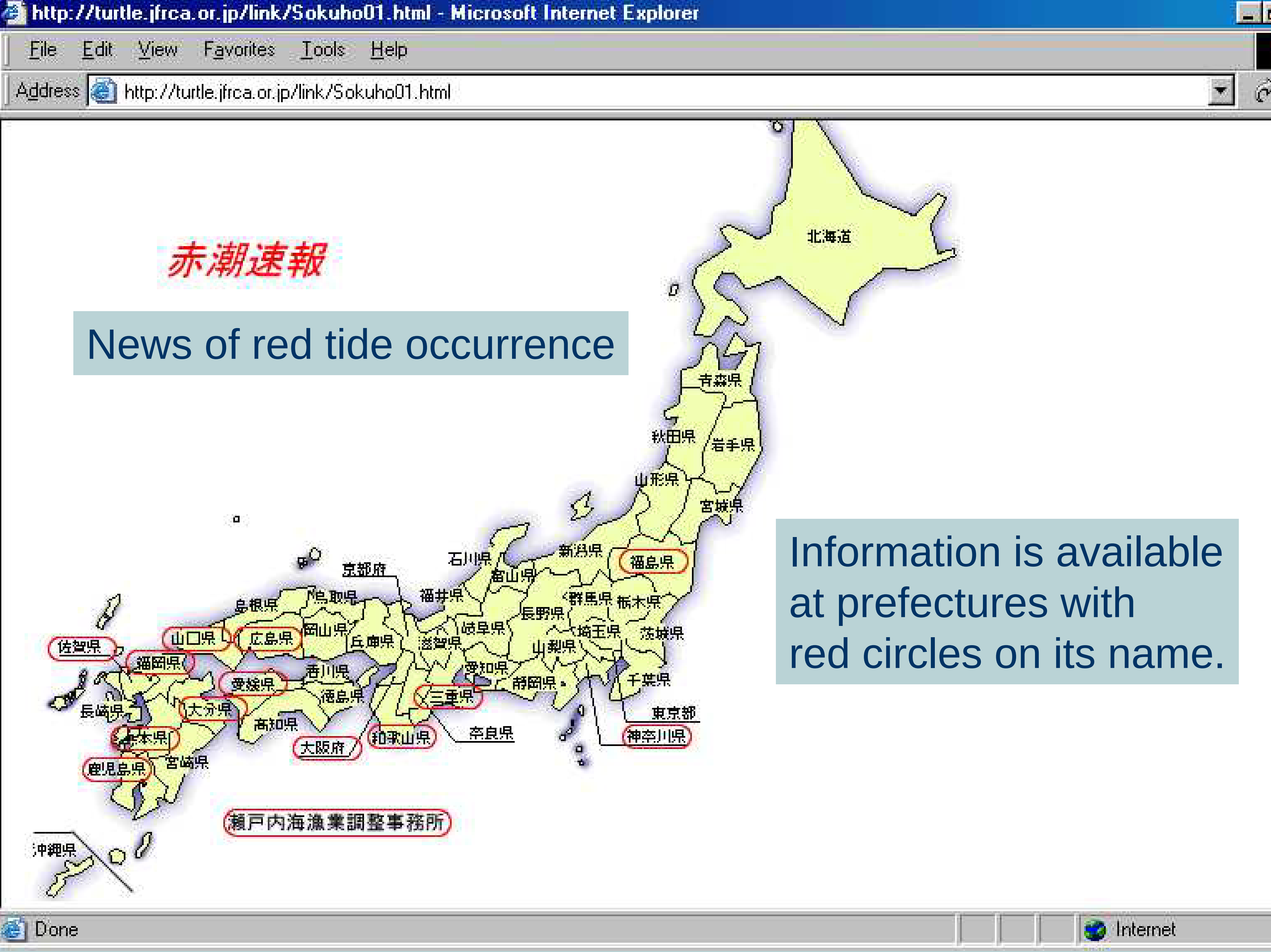
関連情報の提供

海洋観測情報（日本海洋データセンター）
人工衛星観測情報（宇宙開発事業団　地球観測センター）
気象観測情報（気象業務支援センター）
環境情報（国立環境研究所　環境情報センター）

関係機関へのリンク

ご意見・ご感想はこちらまで
（社）日本水産資源保護協会

Internet



News of red tide occurrence

Information is available at prefectures with red circles on its name.

Red tides monitored by Osaka Prefecture in May 2003

fisheries damage

赤潮発生状況（平成15年5月）　発生　8件　（漁業被害なし）

番号	発生期間(日間)	灘　名	県　名	発　生　水　域	赤潮構成プランクトン	最高細胞数(個/ml)	最大面積(Km²)	漁業被害
1	4/21 ～ 5/19 ###	大阪湾	大阪府	神戸市から堺市にかけての沿岸および沖合域	*Skeletonema costatum*	157,000	270	無
2	5/6 (1)	大阪湾	大阪府	西宮市から泉大津市にかけての沿岸域	*Prorocentrum minimum*	39,400	190	無
3	5/7 ～ 5/14 (8)	土佐湾	高知県	野見湾内	*Heterosigma akashiwo*	10,300	不明	無
4	5/19 (1)	大阪湾	大阪府	神戸市から西宮市にかけての沿岸域	*Pseudo-nitzchia sp.* *Skeletonema costatum*	3,130	140	無
5	5/19 ～ 5/27 (9)	播磨灘	香川県	播磨灘南西部海域	*Noctiluca scintillans*	不明	不明	無
6	5/22 ～ 5/23 (2)	熊野灘	和歌山県	串本漁港～大島漁港	*Noctiluca scintillans*	2,420	不明	無
7	5/22 ～ 5/27 (6)	豊後水道	大分県	猪串湾猪串地先	*Prorocentrum triestinum*	275	不明	無
8	5/26 ～ 5/27 (2)	紀伊水道	和歌山県	湯浅湾鷹島地先	*Noctiluca scintillans*	240	不明	無

date of occurrence

location

causative species

size of area

max cell nos.

http://www.suiken.pref.kumamoto.jp/kan/akasio.htm - Microsoft Internet Explorer

Address http://www.suiken.pref.kumamoto.jp/kan/akasio.htm

Information from Kumamoto Prefecture

ーーー 漁場環境研究部 ーーー

漁業者・漁協からの情報や、当センターの各種調査、定期調査時に赤潮を発見した場合、関係機関と協力して、赤潮の種類や分布範囲、細胞数などを調査し、それらの情報を養殖業者や漁協等に情報発信しています。

最新の情報

Alarm was issued, because of high concentration of harmful species

レベル	番号	調査日	海区	海域	種類	細胞数 cells/ml	備考
警報	10	H15.6.23	八代海	御所浦町長浦	ｺｯｸﾛﾃﾞｨﾆｳﾑ ﾎﾟﾘｸﾘｺｲﾃﾞｽ	1,350	御所浦町水産研究ｾﾝﾀｰ調べ
	11 (続報)	H15.6.24	八代海	御所浦町長浦 倉岳町棚底湾	ｺｯｸﾛﾃﾞｨﾆｳﾑ ﾎﾟﾘｸﾘｺｲﾃﾞｽ	400 495	下浦湾 15 栖本町 22 御所浦町元浦 25 龍ヶ岳町大道 9 龍ヶ岳町樋島 44 田浦町 0 福浦湾 0 津奈木町合串 14
	13	H15.6.30	八代海	御所浦町周辺 河浦町船津	シャットネラ アンティカ	15 18	松島町 1 龍ヶ岳町樋島 2 龍ヶ岳町大道 6 倉岳町棚底 1 栖本町 2 本渡市楠浦 3

Done Internet

http://www.suiken.pref.kumamoto.jp/kan/akasio.htm - Microsoft Internet Explorer

Address http://www.suiken.pref.kumamoto.jp/kan/akasio.htm

H15.7.26	（その他）	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ		姫戸沖　5
H15.7.28	御所浦町周辺	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ	０	

・熊本県養殖漁業協同組合調べ

調査日	海域	種類	細胞数（cells/ml）	備考
H15.7.1	栖本町沖及び新和町沖	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ	３～５	
H15.7.2	栖本町沖及び新和町沖	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ	１～３	
H15.7.4	栖本町沖及び新和町沖	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ	３～２８	新和町中田　２[illegible]
H15.7.5（午前）	栖本町沖～牛深市沖	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ	０～３	新和町中田　[illegible]
H15.7.6(午後)	栖本町沖～牛深市沖	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ	０～３６	新和町中田　７ 久玉湾奥　３[illegible]
H15.7.7(午後)	栖本町沖～牛深市沖	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ	０～３２	新和町中田　[illegible] 久玉湾奥　３[illegible]
H15.7.10（午後）	栖本町沖～牛深市沖	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ	０～３	栖本町沖　６ 久玉湾奥　１８
H15.7.12(午後)	栖本町沖～牛深市沖	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ	０～２	栖本町沖　１ 新和町中田　[illegible] 久玉湾湾奥　１
H15.7.13（午後）	栖本町沖～牛深市沖	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ	０～６	栖本町沖　１ 新和町中田　１[illegible]
H15.7.14(午後)	栖本町沖～牛深市沖	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ	０～３３	栖本町沖　３[illegible]
H15.7.15(午後)	栖本町沖～牛深市沖	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ	０～１２	栖本町沖　１[illegible] 新和町中田　３４
H15.7.16(午後)	栖本町沖～牛深市沖	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ	０～１２	栖本町沖　１[illegible] 新和町中田　３４
				栖本町　[illegible]

data with low cell number are also in information of red tide

（１３時）				
H15.7.23	龍ヶ岳町大道沖	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ	０～８	
H15.7.24	龍ヶ岳町大道沖	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ	０～４０	高戸　１，０００（着色有り）
H15.7.25	龍ヶ岳町大道沖	ｼｬｯﾄﾈﾗ　ｱﾝﾃｨｰｶ	０	

赤潮情報リンク　都道府県による赤潮発生等に関する速報（社団法人　日本水産資源保護協会）

警報・注意報の基準（熊本県） criteria for issuing the two types of the alarm

species	注意報細胞数（細胞/ml）	警報細胞数（細胞/ml）	備　考
シャットネラ　アンティカ	５以上	１０以上	極めて有害
シャットネラ　マリーナ	１０以上	１００以上	極めて有害
ヘテロシグマ　アカシオ	１００以上	１，０００以上	
コックロディニウム　ポリクリコイデス	１００以上	５００以上	極めて有害
ギムノディニウム　ミキモトイ	１００以上	１，０００以上	
ギムノディニウム　sp.	１０以上	１００以上	極めて有害
ヘテロカプサ　サーキュラリスカーマ	５以上	５０以上	貝類のみ有害

cell number for caution

cell number for alarm

these cell numbers are set low, as to have time to prepare countermeasures

harmfulness

本基準は魚介類を養殖・畜養している漁業者に注意を促すためのものです。

急激なプランクトンの増殖に対応ができるよう、細胞数はやや低めに設定してあります。

ホームページへ戻る

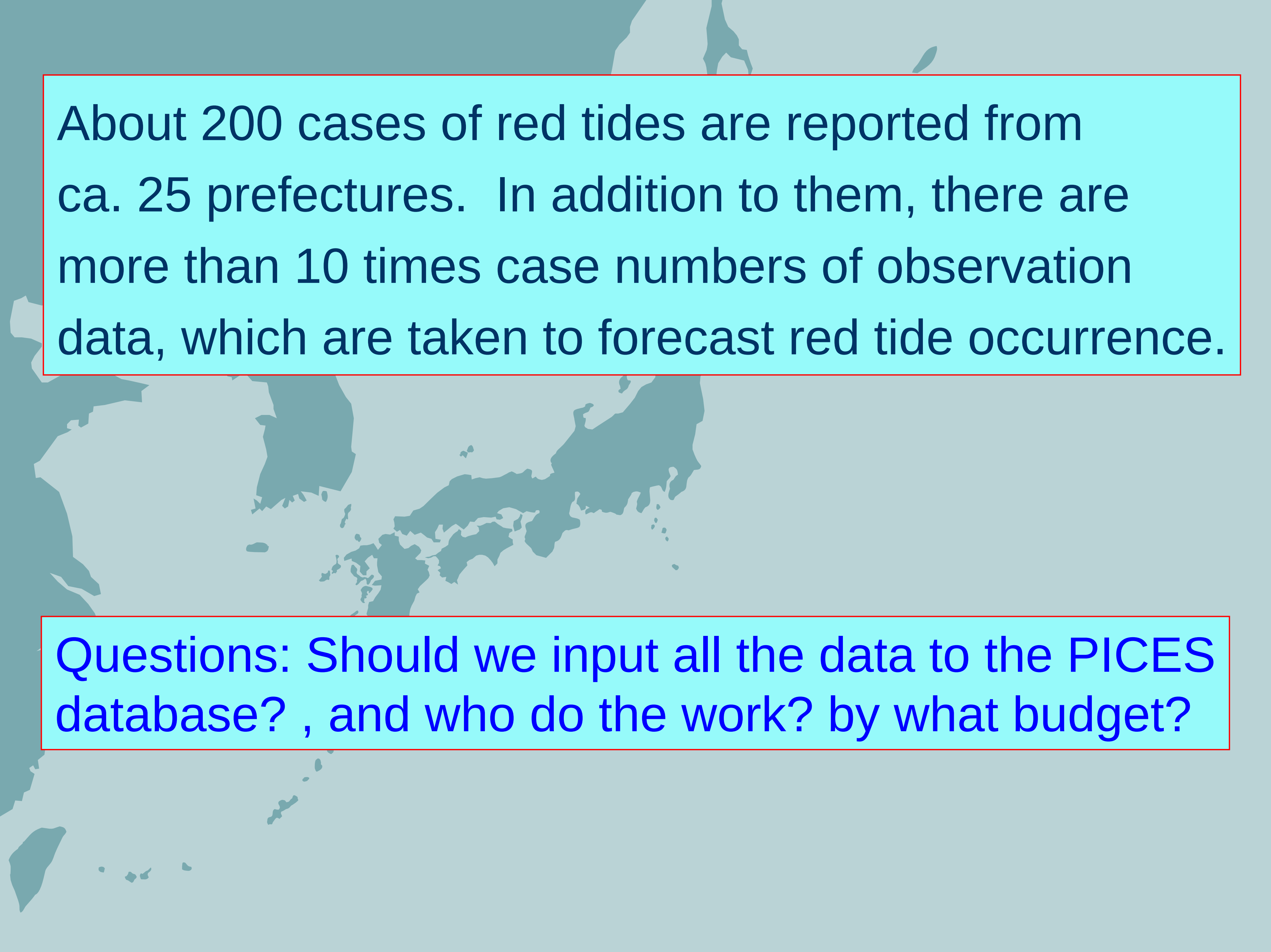
Fukushima Prefecture
No red tide now.

赤　潮　情　報

－現在、福島県沿岸では**赤潮が発生しておりません。**－

発生確認日時：平成15年4月18日
発生確認場所：いわき市沖　距岸3～5マイル
原因プランクトン：ノクチルカ *(Noctiluca)*

Red tide occurred a month before



About 200 cases of red tides are reported from ca. 25 prefectures. In addition to them, there are more than 10 times case numbers of observation data, which are taken to forecast red tide occurrence.

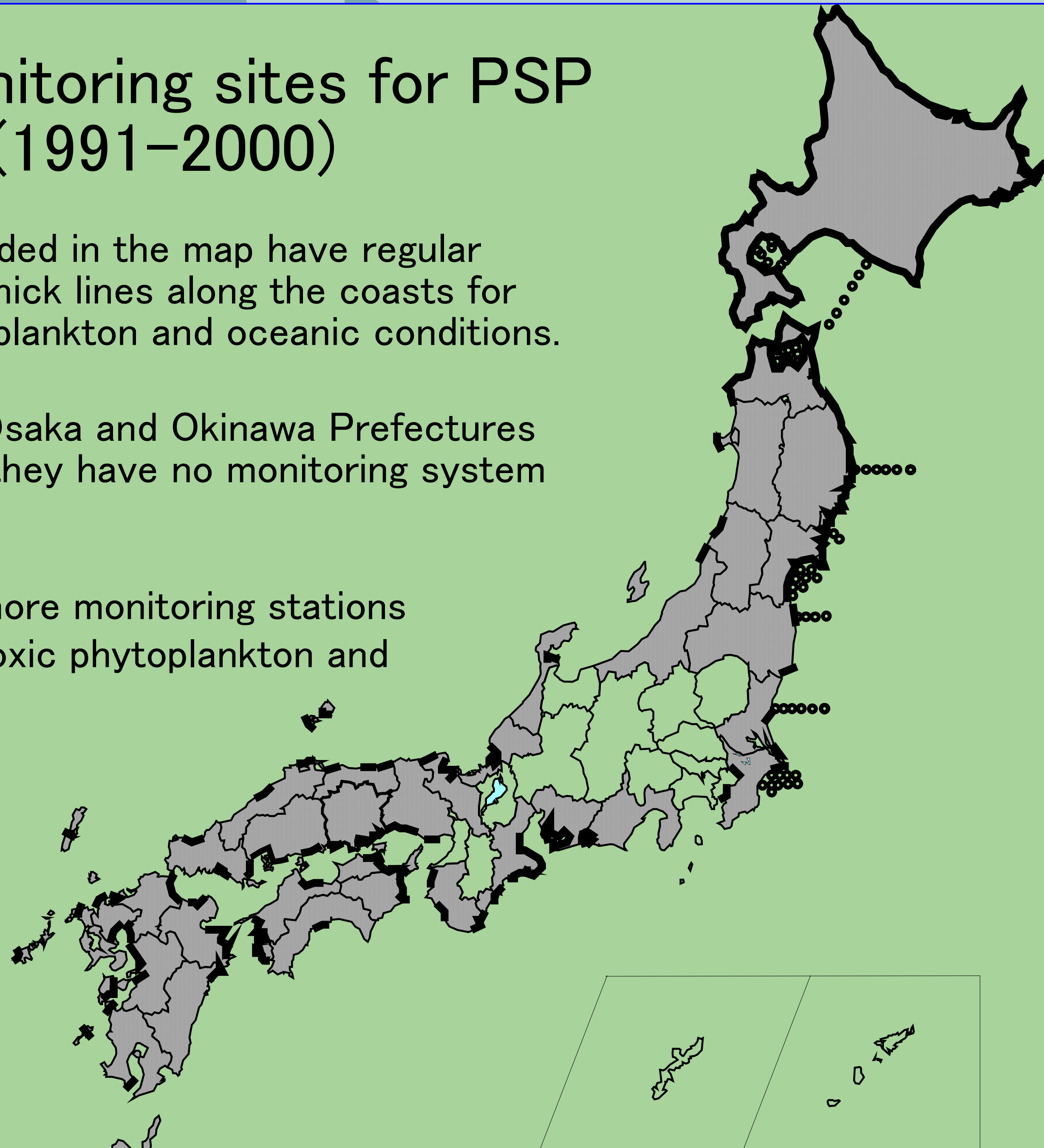
Questions: Should we input all the data to the PICES database? , and who do the work? by what budget?

Recent regular monitoring sites for PSP and DSP in Japan (1991–2000)

In Japan, 34 prefectures shaded in the map have regular monitoring sites showed with thick lines along the coasts for shellfish poisoning, toxic phytoplankton and oceanic conditions.

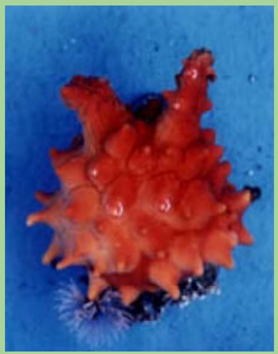
Tokyo, Kanagawa, Toyama, Osaka and Okinawa Prefectures have the coastlines, however, they have no monitoring system for shellfish poisonings.

Some prefectures have offshore monitoring stations showed with open circles for toxic phytoplankton and oceanic conditions.

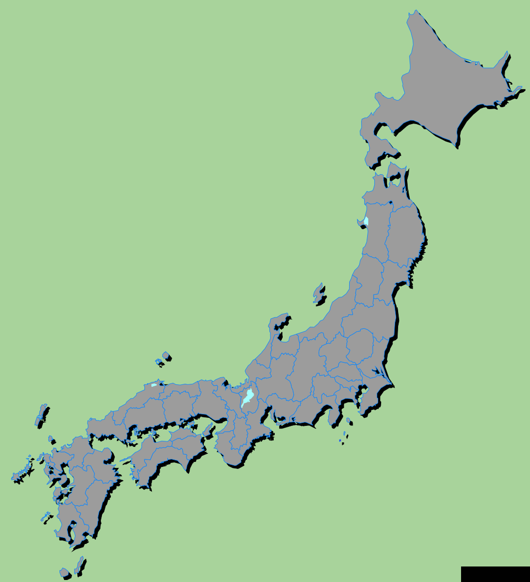


Common bivalve species and ascidian species for monitoring on the PSP and DSP in Japan.

Yesso Sallop
Pactinopectein yessoensis

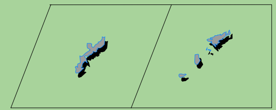


Sea squirt
Halocynthia roretzi



Japanese oyster
(Giant pacific oyster)
Crassostrea gigas

Noble Scallop
Chlamys nobilis



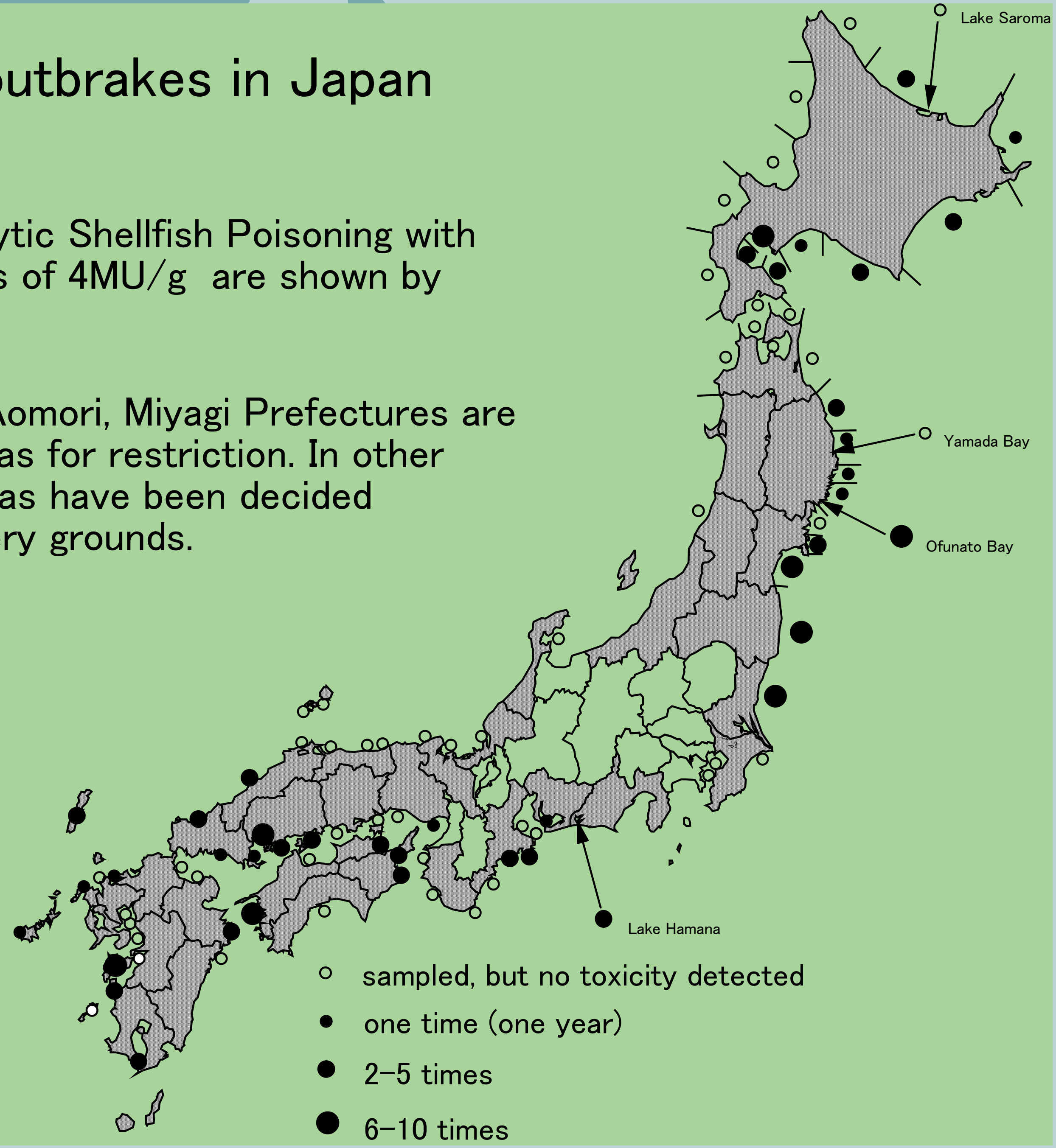
Blue Mussel
Mytilus edulis

Short-necked clam
Tapes philippinaris

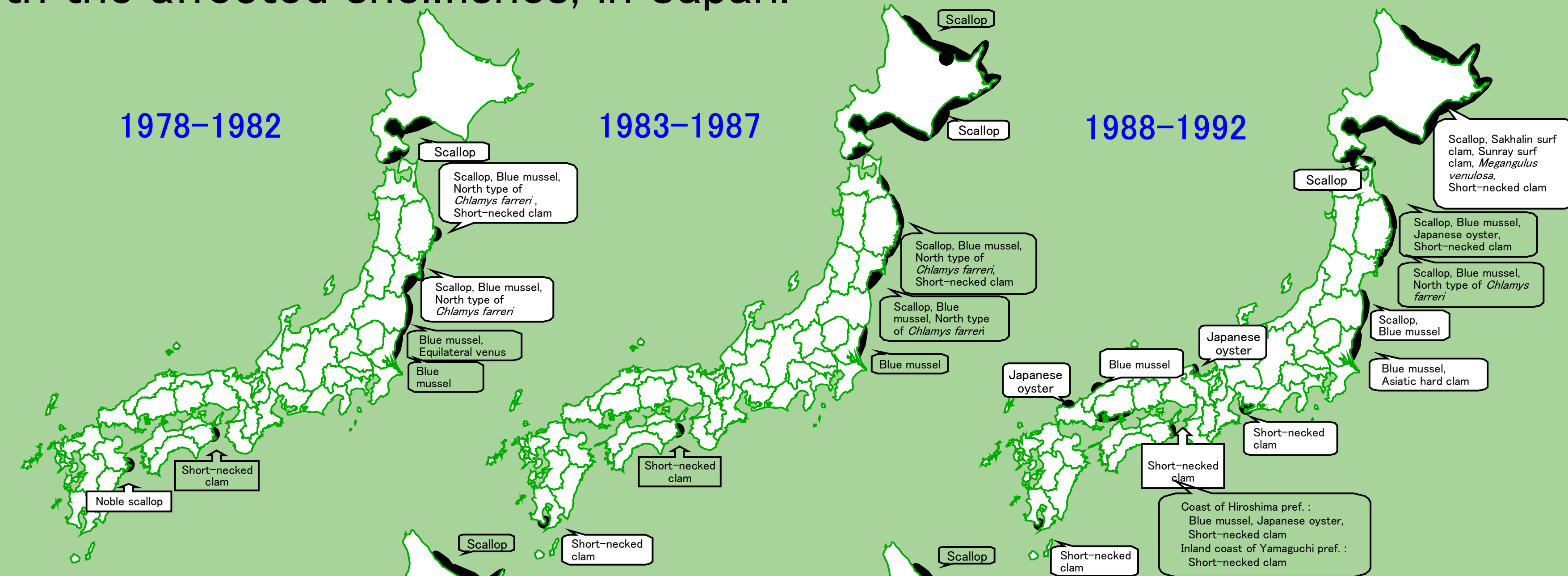
Decadal map of PSP outbrakes in Japan (1991–2000)

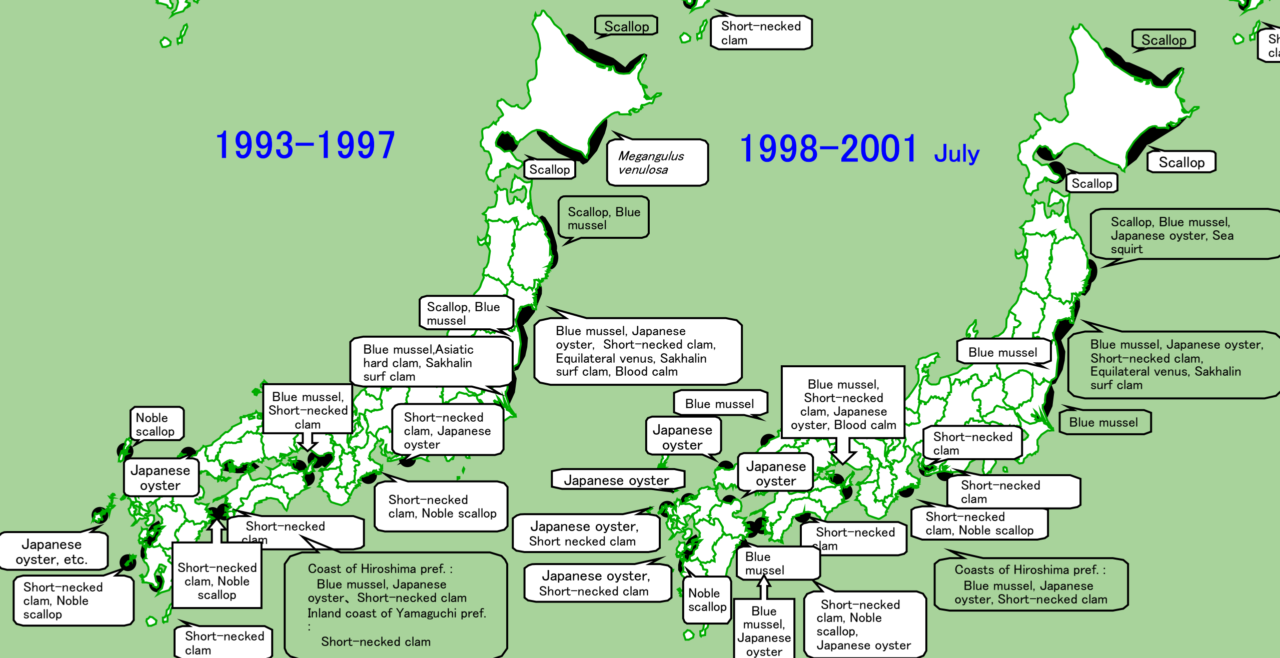
Sea areas affected by Paralytic Shellfish Poisoning with exceeding the quarantine limits of 4MU/g are shown by closed circles.

Coasts of Hokkaido, Iwate, Aomori, Miyagi Prefectures are officially divided into some areas for restriction. In other prefectures, the restricted areas have been decided according to the shellfish fishery grounds.



Sea areas exceeded the quarantine limit of PSP 4.0MU/g for each period, with the affected shellfishes, in Japan.





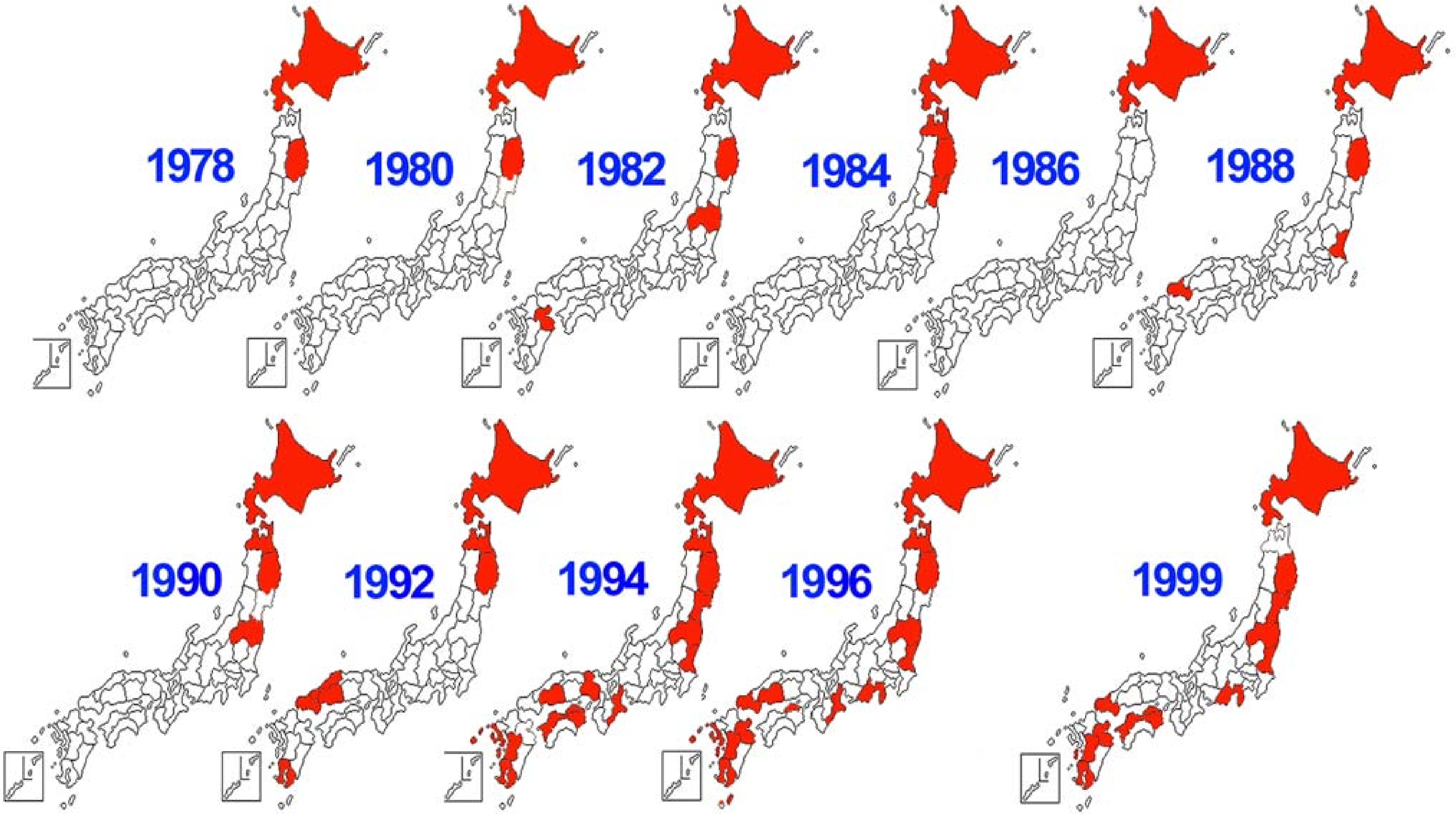
In Japan, PSP was first confirmed in 1948.

Initially, the problem involved in only cultured Yesso Sallop (*Patinopecten yessoensis*) .

However, the areas of PSP became to expand from northern to southwester waters.

And, the number of affected species by PSP has also increased.

Expansion of area affected by PSP toxin contamination in cultured shellfish in Japan

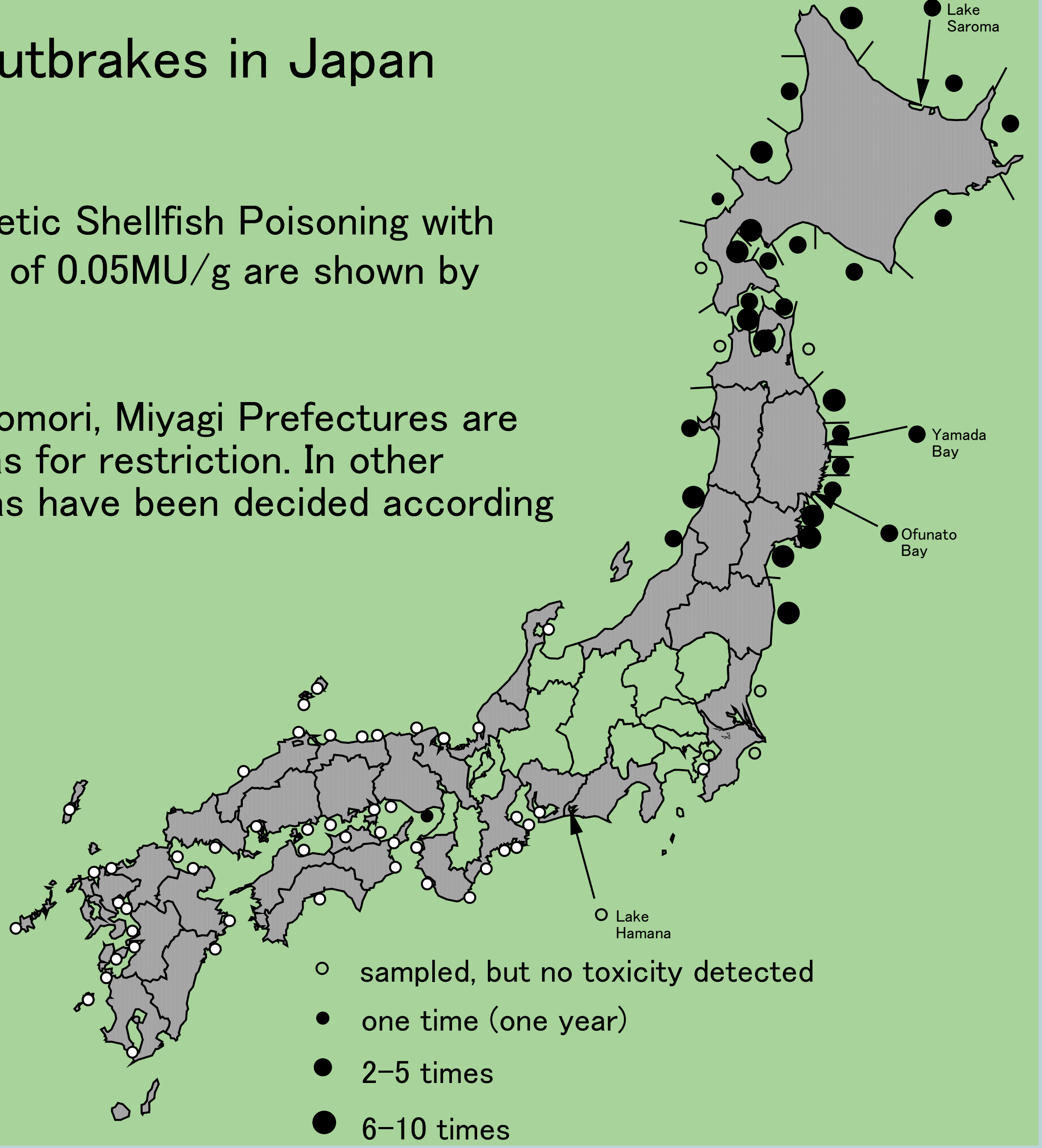


Serious economic loss, but no poisoning case

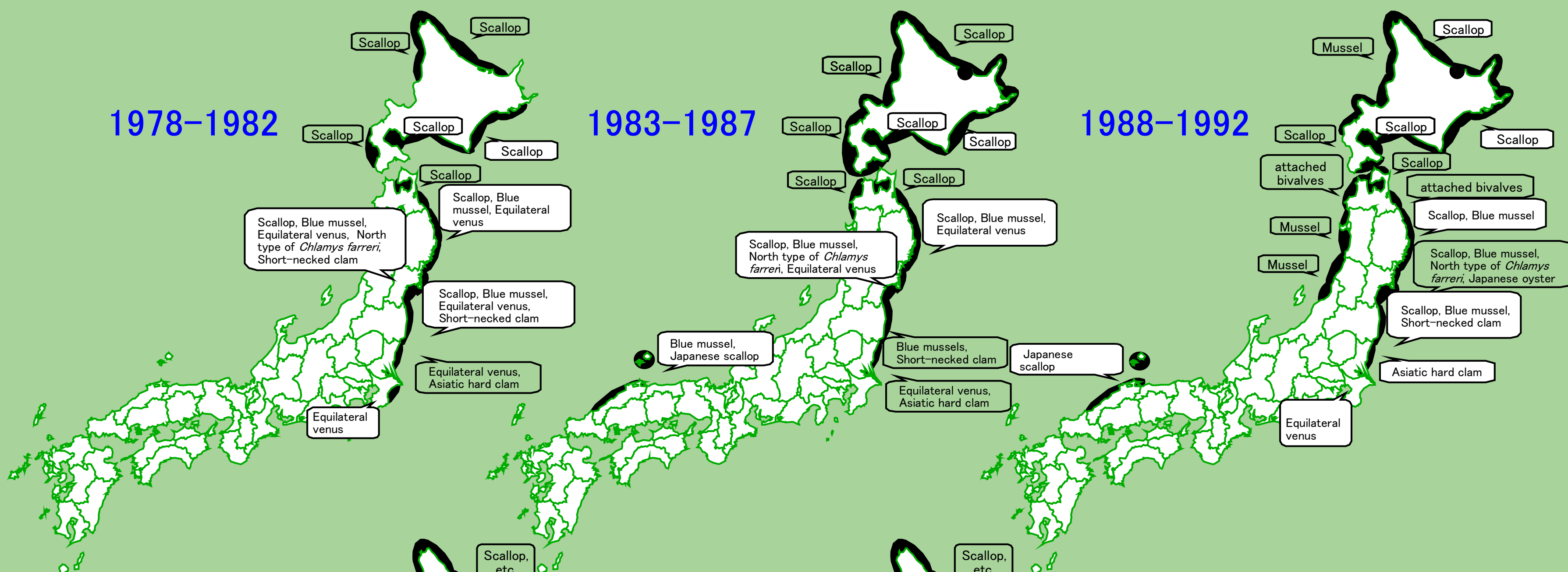
Decadal map of DSP outbrakes in Japan (1991–2000)

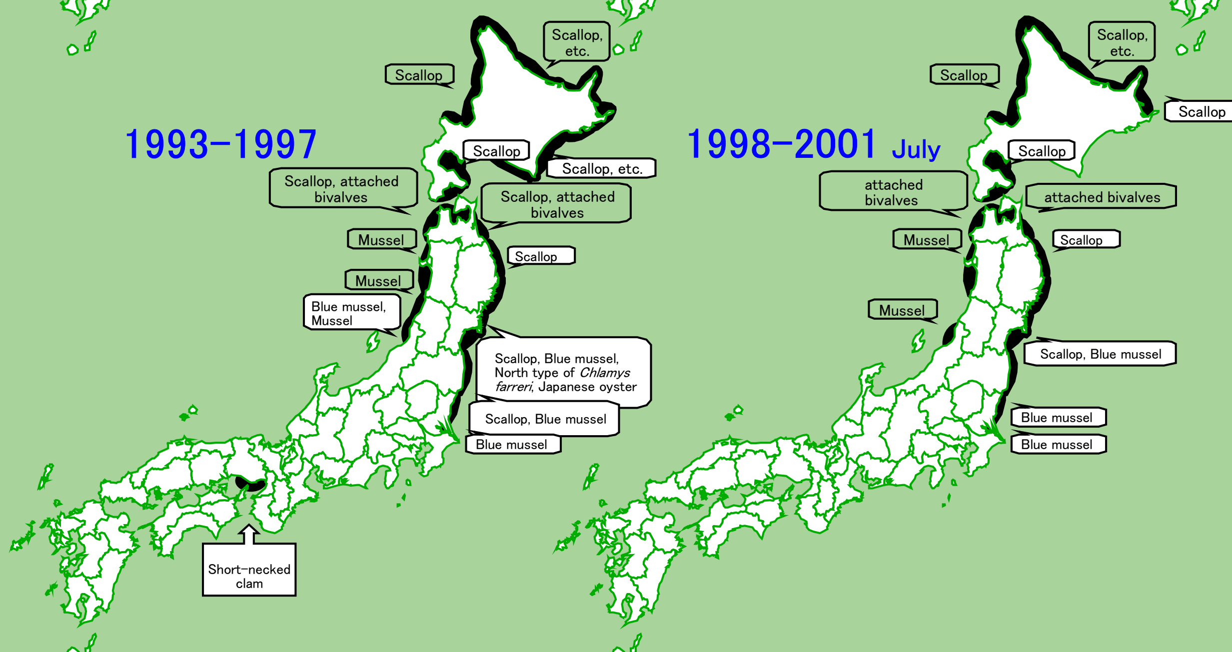
Sea areas affected by Diarrhetic Shellfish Poisoning with exceeding the quarantine limits of 0.05MU/g are shown by closed circles.

Coasts of Hokkaido, Iwate, Aomori, Miyagi Prefectures are officially divided into some areas for restriction. In other prefectures, the restricted areas have been decided according to the shellfish fishery grounds.



Sea areas exceeded the quarantine limit of DSP 0.05MU/g for each period, with the affected shellfishes, in Japan.



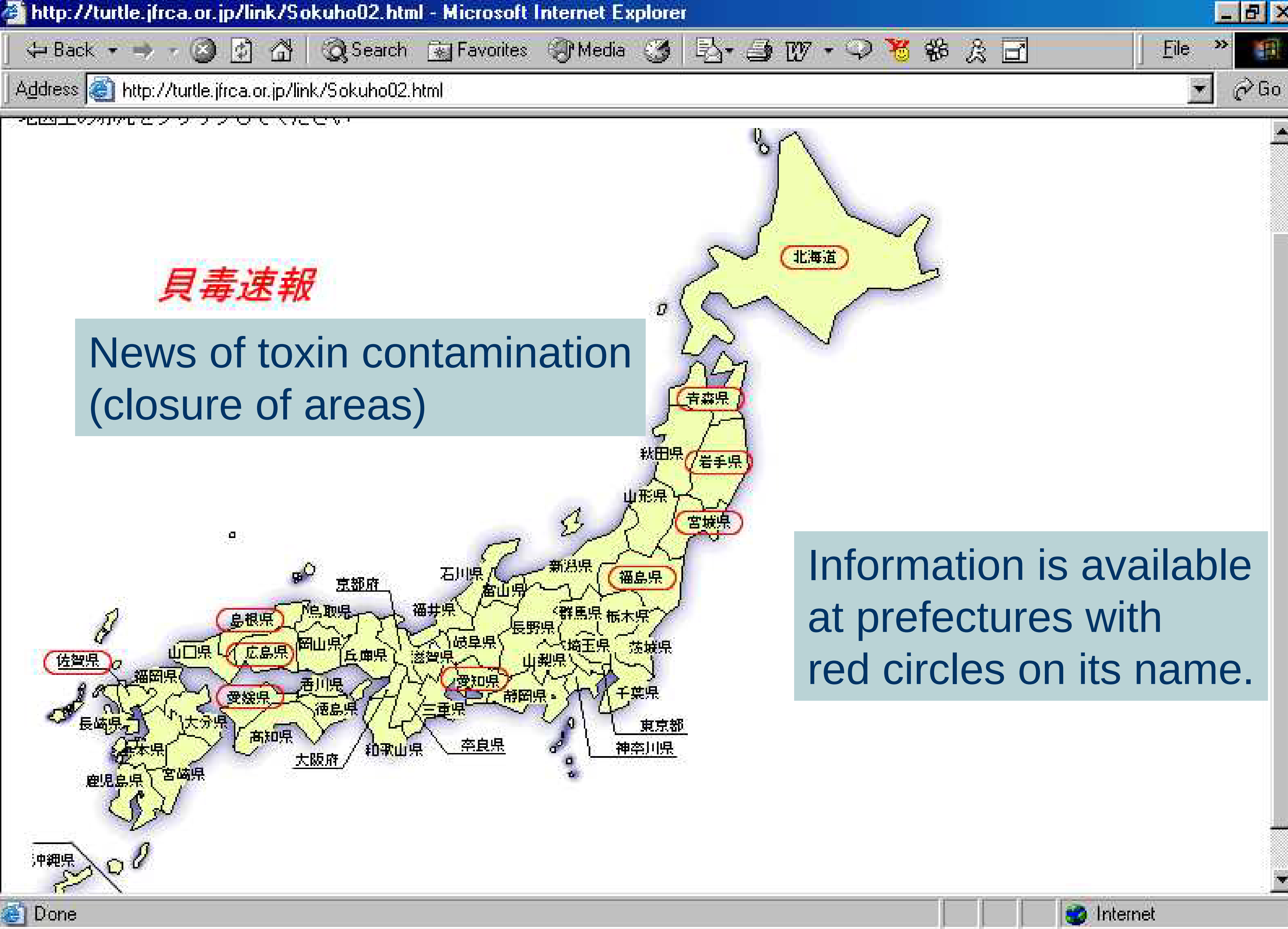


With respect to DSP, the first case in 1976 was reported in northern Japan.

In 1977–1978, shellfish poisonings in cultured Yesso Sallop (*Patinopecten yessoensis*) became a serious problem in northern Japan.

Initially, the problem involved in only scallops, but the number of affected species by DSP has increased rapidly.

Although, the areas of DSP have been not so expanding to southwestern waters ever since.



News of toxin contamination (closure of areas)

Information is available at prefectures with red circles on its name.

貝　毒　情　報

現在、福島県内でプランクトンによる貝毒での規制はありません。

－平成15年3月13日より出荷自主規制となっていましたムラサキイガイは、**5月30日付けで規制が解除されました。**－

（平成15年3月13日からの出荷自主規制に関する詳細はこちらをご覧ください）

2001（平成13）年以降の貝毒発生による出荷自主規制状況

出荷規制期間	対象種	貝毒種類	規制海域
2003（平成15）年3月13日～5月30日	ムラサキイガイ（シュウリガイ）	麻痺性貝毒	福島県海域全域
2001（平成13）年3月15日～5月24日	ムラサキイガイ（シュウリガイ）	麻痺性貝毒	福島県海域全域

貝毒って何ですか？？

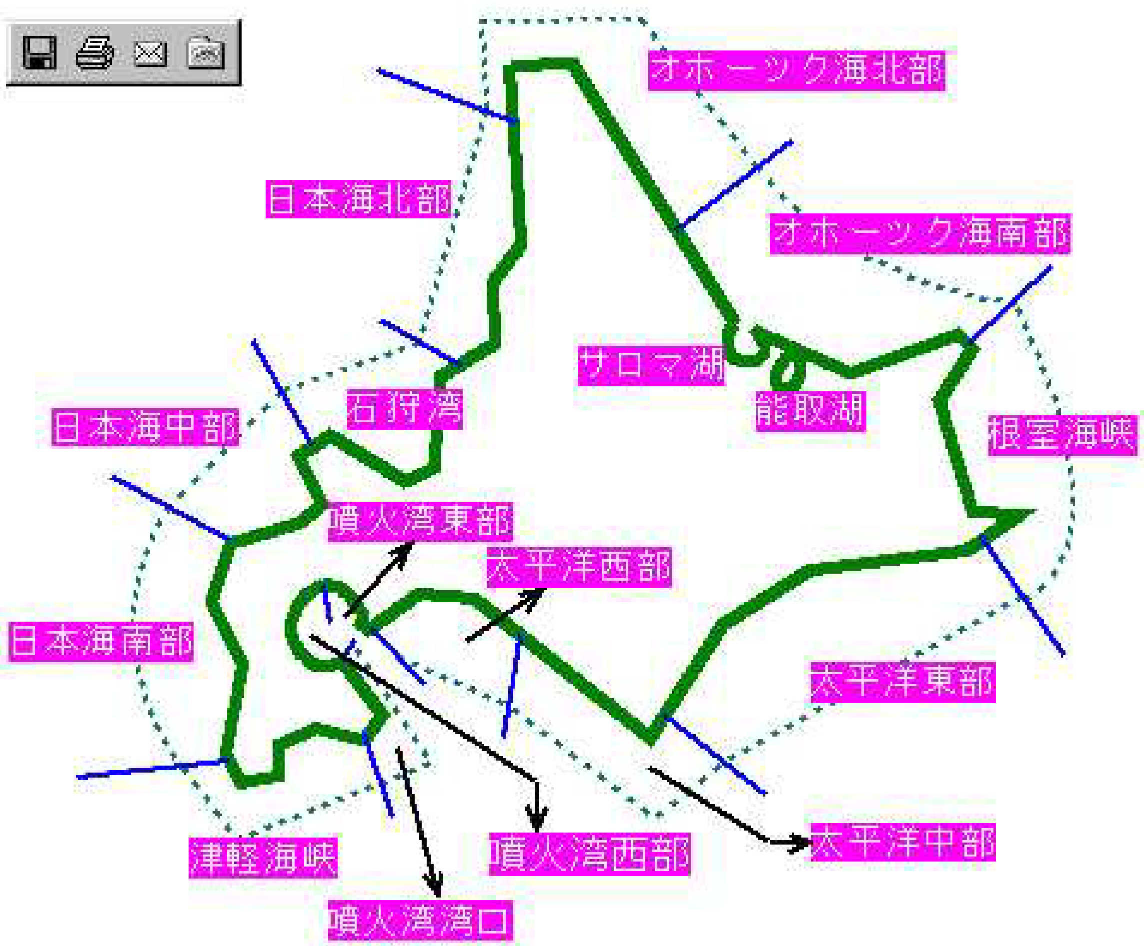
貝毒は、中毒の症状から、麻痺性貝毒と下痢性貝毒に分けられます。いずれも海水中に繁殖した有毒プランクトンを二枚貝等が摂食し、貝の体内に毒を蓄積することにより発生します。主にホタテガイ、アサリ、カキ、ムラサキイガイ等が毒化します。毒成分は、熱に強いので、加熱調理しても毒性は変化しません。

　麻痺性貝毒とは、その名の通り食べると麻痺性の中毒を起こし、呼吸麻痺により死亡することもある非常に怖い毒です。この毒に対する効果的な治療薬はなく、毒成分はサリン、VXガス同様、化学兵器として登録され、製造や使用が厳しく規制されています。日本でも、過去に中毒による死者が出ています。原因生物は、渦鞭毛藻の一種、アレキサンドリウム属等の有毒プランクトンです。

　下痢性貝毒とは、その名の通り食べると下痢、吐き気、腹痛等胃腸障害を起こす毒ですが、死亡例はなく、回復も比較的早く、後遺症もないため、生命に対する危険度は、麻痺性貝毒より低いと考えられます。原因プランクトンは、渦鞭毛藻の一種、ディノフィシス属等の有毒プランクトンです。

http://www.pref.hokkaido.jp/srinmu/sr-skeie/contents/kaidoku.htm - Microsoft Internet Explorer

ホタテガイ生産海域の区分



トップページに戻る→ Home

Done Internet

Data harmonization:

A. Data related to red tide including HABs

1. Data collected by mandatory organization
   - 1-1. Data collected by regular monitoring
     - . mostly not HAB events
     - . useful for oceanographic analysis
   - 1-2. Data collected at red tide occurrence
     - . HABs are ca. 10% of red tides
     - . most of cases w/ oceanographic data
2. Data collected by research organization
   - . maybe some data available after publication

B. Data related to toxic plankton blooms

- . date of harvest closure
- . toxicity and oceanographic data incl. plankton are available

Too many data (data selection problem)
Problem of translation (cost vs. benefit problem)
Data ownership (possible to negotiate partially)

付表１　環境調査及び採水プランクトン中の渦鞭毛藻類査定結果

調査年月日(時刻)	天気	雲量	風向	風力	波浪	うねり	水色	透明度(m)	調査水深(m)	水温(℃)	塩分	渦鞭毛藻出現数 (cells/L) Ceratium属			Dinophysis属									Proro-centrum属		Alexand-rium属		Protoperidi-nium属		Gymnodi-nium属	分裂細胞 Dinophysis属			
												C.a	C.b	C.f	D.f	D.a	D.m	D.c	D.i	D.rd	D.rg	D.n	D.t	P.c	P.m	A.c	A.t	P.c	P.d	G.c	D.f	D.a	D.m	D.c
96.05.27	c	9		0	0	0	5	9.0	0	12.7	32.599			65	5	825												35	10					
(11:05-)									5	10.4	32.848		20	210	70	40				5									10					
									10	10.1	32.942		15	235	115	20													5					
									20	9.9	33.114		20	85	40	5													5					
									30	9.6	33.112		15	60	60	5																		
									33	8.8	33.237		15	75	35	5																		
96.06.03	c	10	SSW	3	2	1	5	12.0	0	13.9	32.609			30		75												20	5					
(09:11-)									5	13.5	32.744		5	30						5									20					
									10	11.7	33.001		10	75	15	5													10					
									20	9.7	33.112		15	130	65	5													5					
									30	9.2	33.225		20	215	75	10													10					
									33	8.3	33.290		10	150	225	20												5						
96.06.10	bc	8	NE	2	2	0	5	12.0	0	14.2	32.929					35												5						
(10:30-)									5	13.8	32.933			5		15												5	5					
									10	13.4	32.952		5	5		20												5	20					
									20	10.1	33.105			5	75	20													35					
									30	9.7	33.155		15	70	50	5													20					
									33	9.4	33.242		15	220	115																			
96.06.17	c	9	ENE	2	2	1	5	11.5	0	15.9	32.704		5	50	15	40				5														
(10:27-)									5	15.2	32.790		5	10	5	15						5												
									10	13.8	32.969		15	10	5	5																		
									20	11.9	32.981			5		10																		
									30	10.1	33.172		135	105	285	15						5							5					
									33	10.3	33.221	5	125	165	2035														10					
96.06.24	c	10	ESE	3	2	0	5	10.0	0	14.4	32.616		10	10	35	10																		
(10:18-)									5	14.4	32.686		5		20	40			5															
									10	13.8	32.842		60	10	35	35																		
									20	9.9	33.163		145	15	260	10				5		5							60					
									30	9.1	33.466																							
									33	9.1	33.471																							
96.07.02	b	2	NE	1	1	0	5	8.0	0	17.0	32.405																	10						
(10:07-)									5	16.1	32.424			20														10						
									10	14.4	32.726			25	15	30												5						
									20	12.4	33.200		55	30	880														5					
									30	12.5	33.645		1220	35	130														5					
									33	11.8	33.528		370	5	195													5						
96.07.08	c	10	ESE	4	3	1	5	9.5	0	15.7	32.447		10	10	5				5															
(09:12-)									5	15.6	32.435		15	20	20																			
									10	14.1	32.813		505	30	275	50													5					
									20	12.8	33.094	10	455	30	1125	10													5					
									30	13.1	33.511	5	320	5	90														10					
									33	12.6	33.522	20	1045	25	370														25					

Data collection has been made by prefectural fisheries experimental stations which are mandated to monitor plankton, shellfish toxicity and environmental parameters, in order to protect fisheries industry, public health and the environment from harmful algal blooms (HABs).

Two types of HABs, i.e. red tides and toxin contamination in shellfish, have been known in Japan.

Accordingly two different monitoring systems have been implemented independently by many prefectures having aquaculture activities in their coastal waters.

Data sets of red tide case and of toxin contamination case are different.

Items and quality of the data are decided by mandatory monitoring organizations.

Data owners are prefectural government.

Red Tide Watcher: Red tide monitoring using satellite images

Facts of Red Tides

Yasuwo Fukuyo

Asian Natural Environmental Science Center

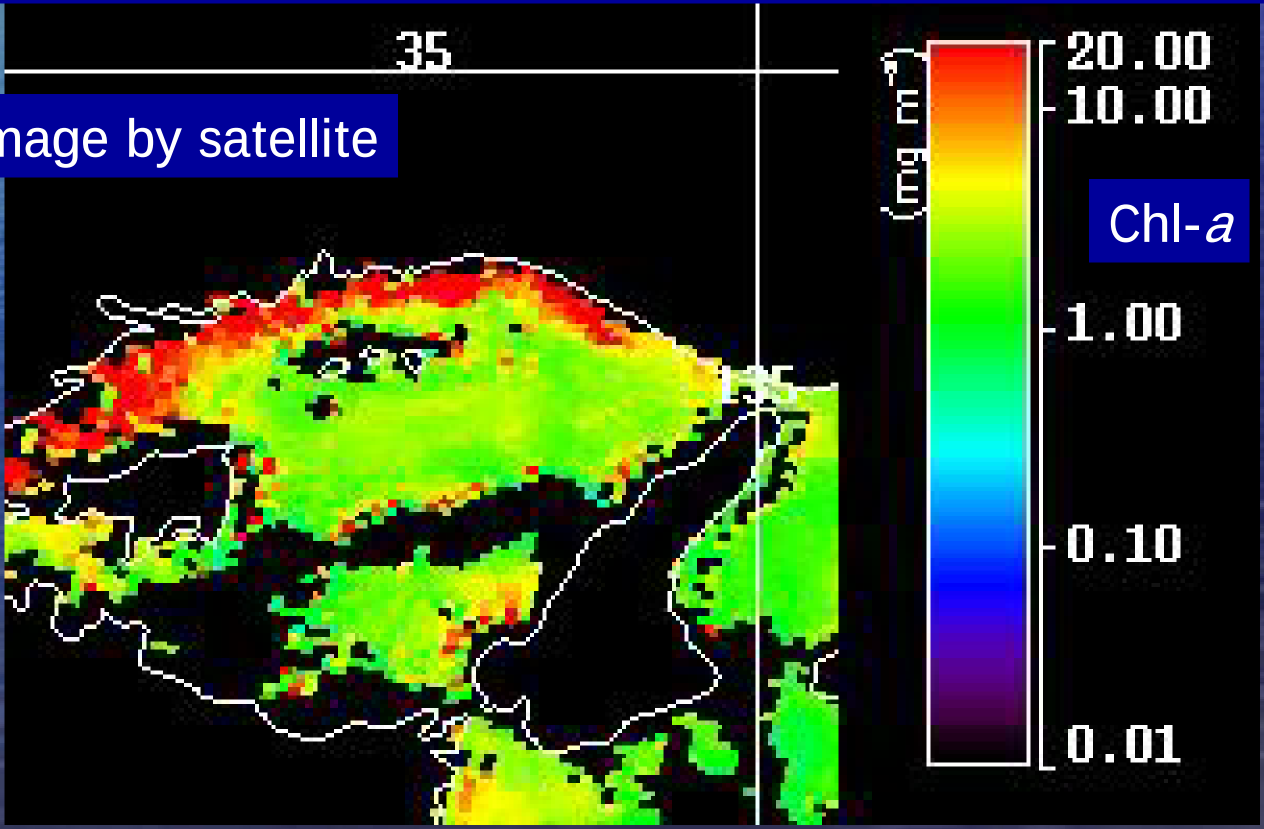
University of Tokyo

Red Tide Watcher

Detection of red tides in their early stage of development using real-time satellite image monitoring in order to prevent negative impacts on fisheries resources, marine ecosystems and human health.

(details will be explained by Omura and Furuya later today)

Red tide image by satellite



In order to develop the monitoring technology, biological oceanographers must pass necessary correct information of red tides to scientists working on satellite image analysis.

What is correct information of red tides ?

What is the **definition** of “red tide” ?

What is the **color** of red tides ?

How many **species** can we find in red tide water ?

How many **causative species** (genus) can we count ?

How many **red tide number** can we observe?

What is the **highest cell number** in red tide water ?

How much **area** did red tides cover ?

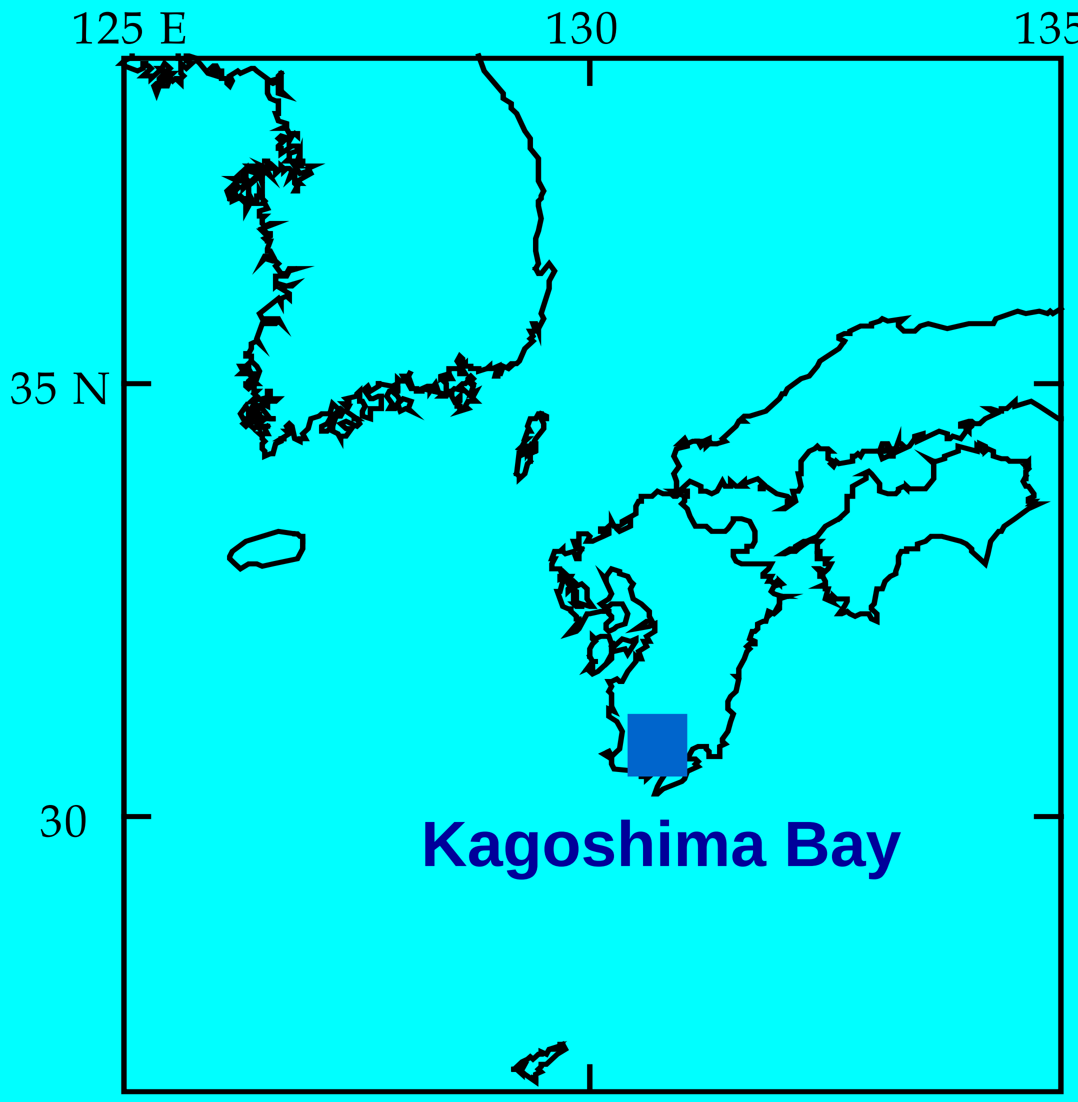
How many **days** did red tides last ?

Most of data in this presentation are from the Annual Report on Red Tides issued by Seto Inland Sea Fisheries Coordination Office in 1993-2001

Definition of “red tide”

“Red tide” is defined as a discoloration of seawater caused by a high biomass of unicellular phytoplankton and zooplankton.

Difficulty in recognizing a red tide case: a case occurred in Kagoshima Bay



Difficulty in recognizing one red tide case

Case number: 1 or many ?

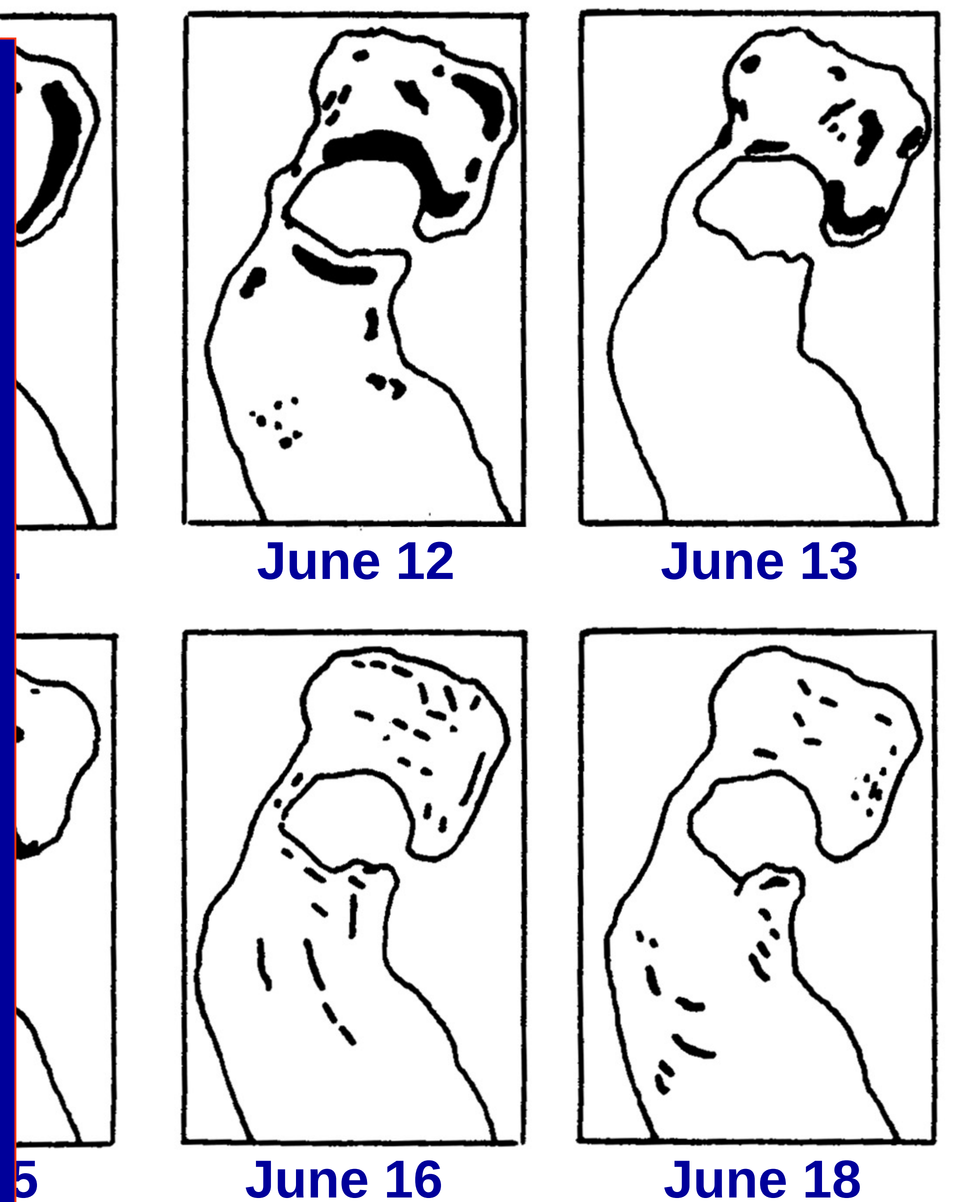
Color: slightly different by area

Causative species: composition different by area

Cell density: different by area

Size of area covered: Whole area or total of parts ?

Duration of red tides: Whole area or parts?



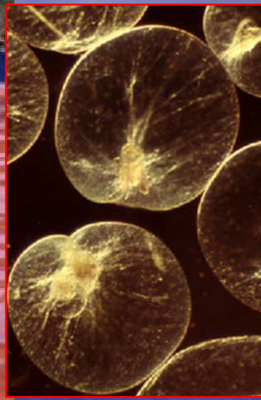
Dark parts: Red tide areas of *Chattonella marina*

What is the color of red tides ? Is it red ?

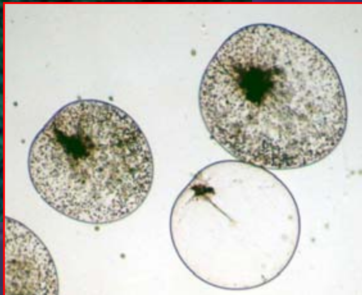
Red Tide caused by *Noctiluca scintillans*
occurred in Seto Inland Sea, Japan (May 6, 1976)

What is the color of red tide ?   Is it pink or green ?

Japan, *Noctiluca*

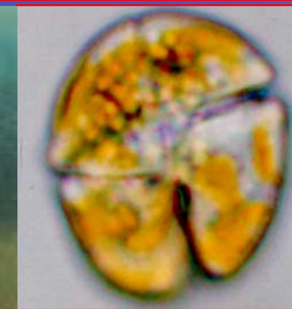


Australia, *Noctiluca*



Thailand, *Noctiluca*

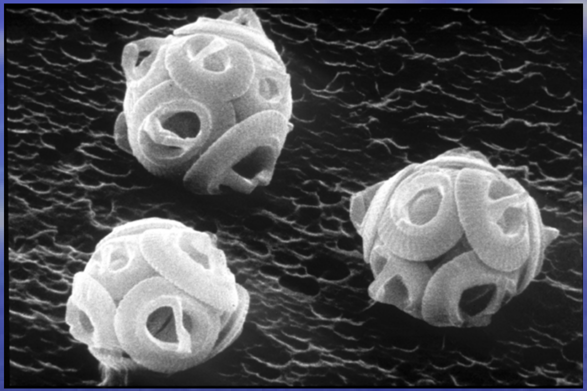
What is the color of red tides ?   Is it brown or grey ?



Japan, *Karenia*

Germany, *Nodularia*

What is the color of red tides ? Is it white ?

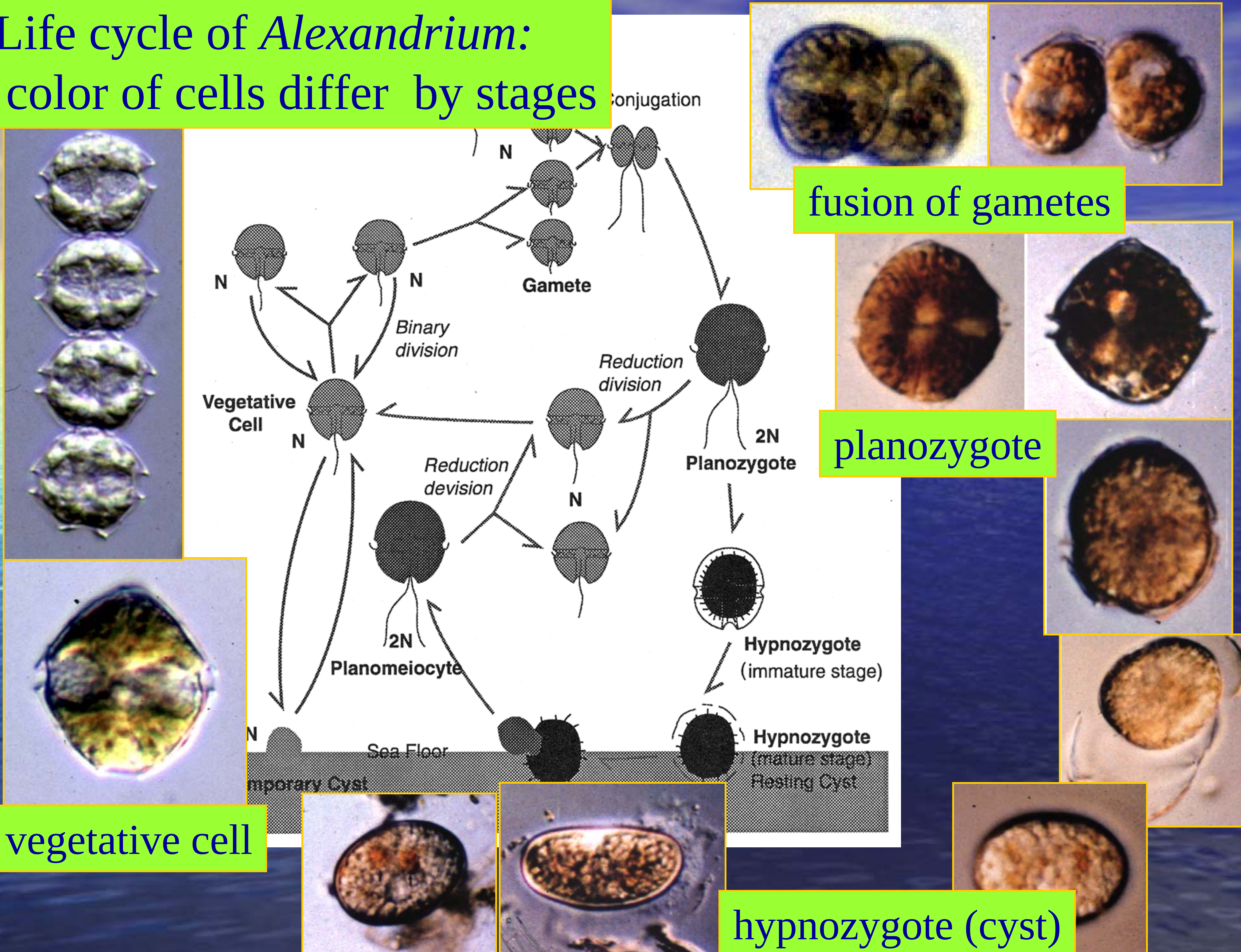


Australia, *Gephyrocapsa*

Color of red tide can be classified in Reddish (incl. dark red, red, pink, yellow red), Brownish (incl. reddish brown, yellow brown, grayish brown), Yellowish (incl. reddish yellow, brownish yellow), Greenish (incl. yellow green), and others (white and grey).

The color varies depending on growth stage algae.

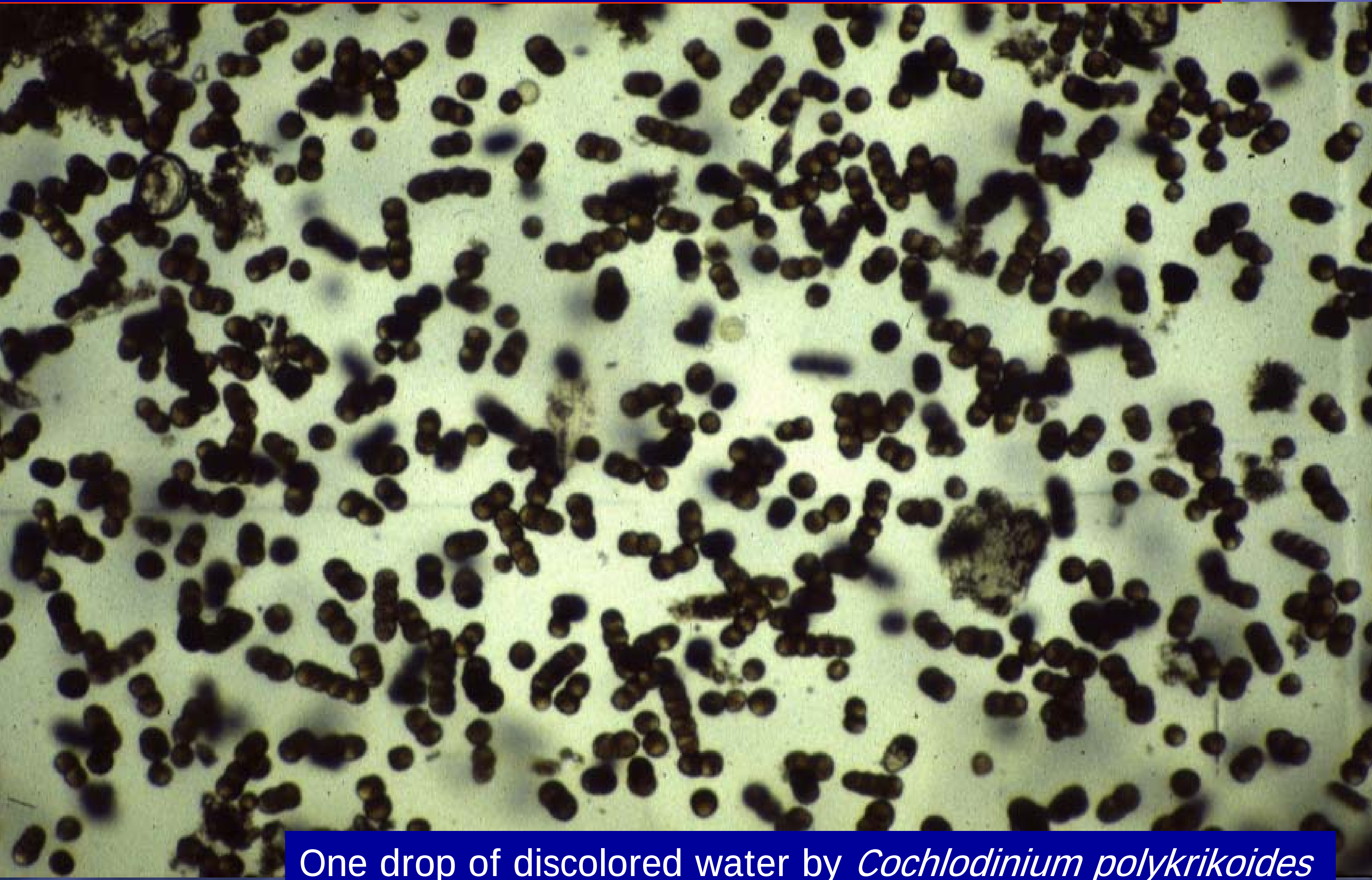
Life cycle of *Alexandrium:* color of cells differ by stages



The color and appearance change by nature of red tide.

Subsurface red tide by *Chattonella antiqua* detected by change of color made by propeller of fishing boats running at red tide area

How many species can we find in red tide water ?



One drop of discolored water by *Cochlodinium polykrikoides* in the Gulf of Thailand