



Topics!

Fisheries in 2015 (2015年の日本漁業)

• Pacific Saury(さんま)

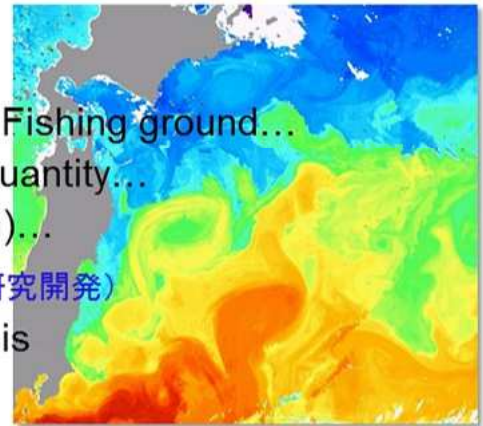
- We love pacific saury! but landed quantity was very small! (非常に悪い! 80年以降最低)
- Global warming?(温暖化?)
- Overfishing?(乱獲?)
- Fishing in the high-seas (公海での操業は問題となった)
- The attention matters in 2016(今年の動向は注目)







- **Affiliated organization of Japan fisheries agency**
  - Profit and Non-profit business (公益事業と収益事業を行う)
- **Information service (情報サービス)**
  - Ocean environment information
  - Fishing ground information
  - Market information
- **Database (データベース管理)**
  - Satellite, Ocean environment, Fishing ground...
  - Landed quantity, Price, Import quantity...
  - VMS, TAC (Total allowable catch)...
- **Research and Development (研究開発)**
  - Fishing ground formation analysis
  - Fish resource analysis



- Is the big catch right? - (「大漁は正義」が通用しない現在の日本漁業)





## Present status of Japan Fisheries

-Resource management fisheries- (資源管理型漁業へのシフト)

- The necessary things for management fishing, EEZ fishing (資源管理漁業・EEZ時代に必要なもの)

- Planned fishing, Efficient fishing (計画的・効率的漁業)

- Introduction of new technology (新しい技術の導入)

- Fisheries device・・・Ecology engine, fishing gear, LED-fishlight etc.

- IT・・・Satellite data, GIS, Offshore internet etc

**MSDI is a important items for efficient fisheries**

**Experiment is important, but, information is too.**

MSDIは効率的計画的操業に必要。経験も重要だが情報の重要性も。

- Trend of coastal fishing (沿岸漁業の再評価・回帰)

- Decline of far sea fisheries (other countries EEZ) 遠洋漁業の衰退

**Coastal environment is complex (spatial and time)**

**High resolution data set and near real time data set**

沿岸漁業の重要性高まる。しかし沿岸環境は時空間変動が大きく難しい→MSDIへ期待



## Application field of the MSDI for fisheries (漁業分野でのMSDI

の具体的な利用範囲)

### The MSDI is utilized in various fields.

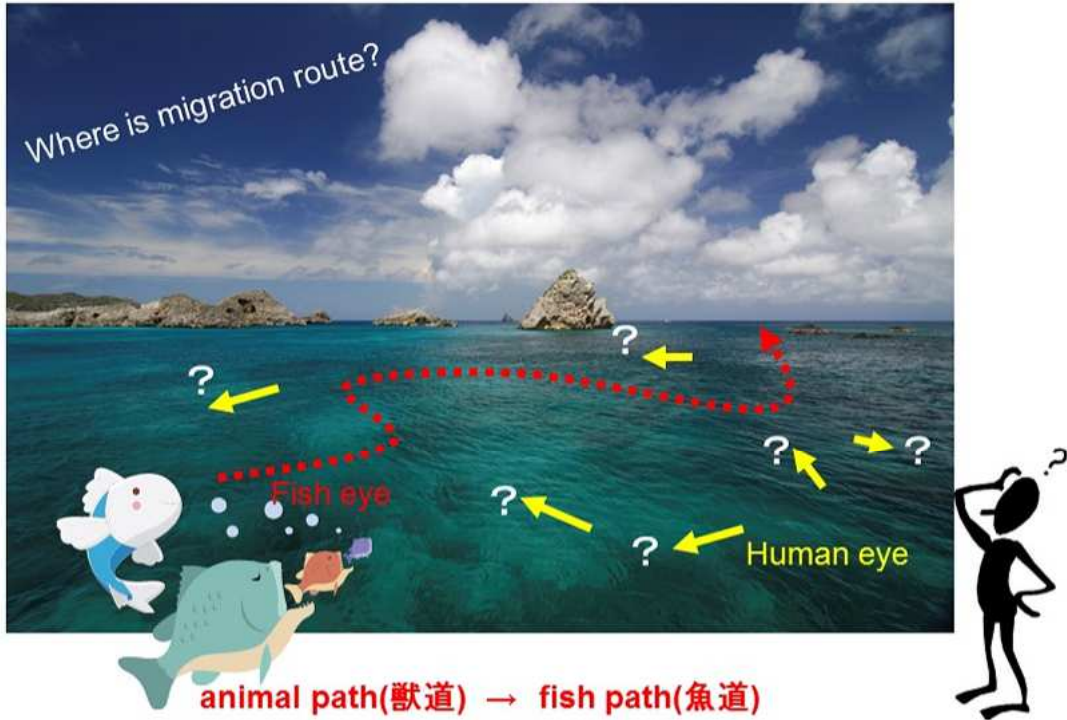
(MSDIはすでに漁業のいろいろなフィールドで活用されている)

- Ocean environment monitoring (海洋監視)
- **Fishing ground** (漁場探査は最も分かりやすい応用分野)
- Fisheries management (漁業管理・資源管理)
- Fisheries damage.(漁業被害)
- VMS, AIS(位置情報管理)
- Ship operation management.(安全運行コース選択)
- Illegal ship detection (不審船対策) etc.



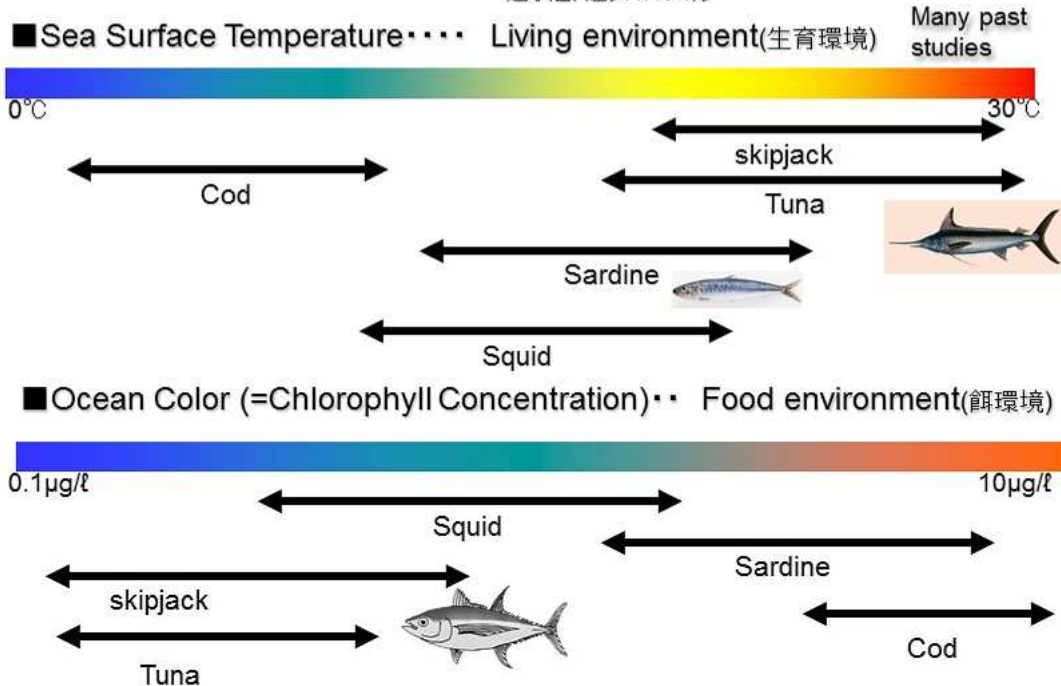


For fishing ground...



(漁場探索への応用の基礎知識)

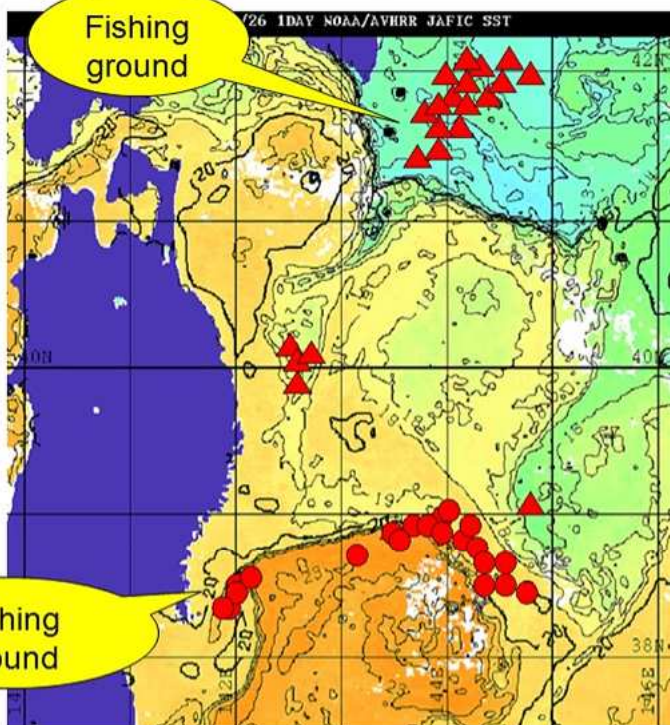
**Basic knowledge (Optimum temperature, Optimum chlorophyll)**  
適水温、適クロロフィル







## Sea Surface Temperature data for fisheries



■ SST is most important information for fisheries.  
(漁業において最も重要な情報)

■ Temperature directly related to living environment  
sardine 18-25°C  
skipjack 20-28°C...  
(魚の適水温を探すこと)

■ To search living environment, it is basis of SST application.

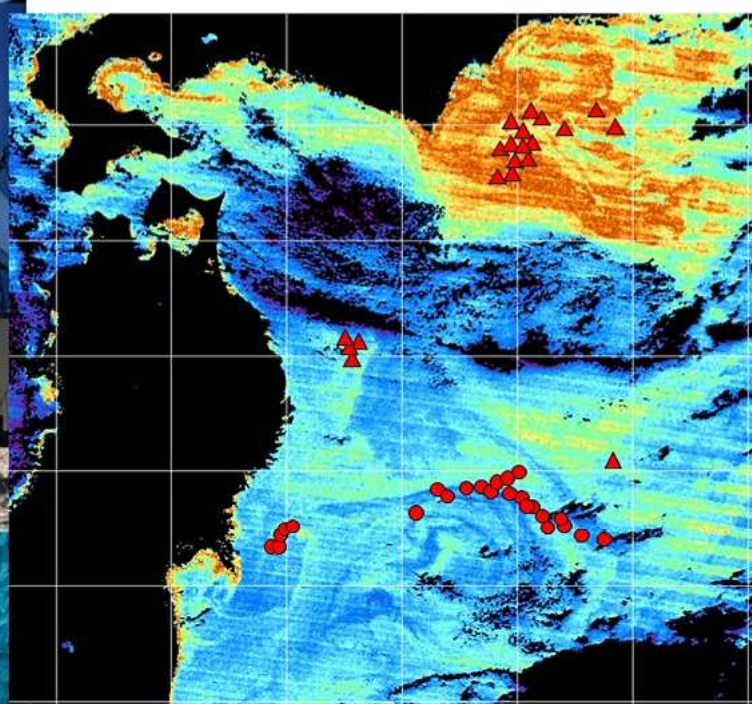
■ Match up satellite data and fishing ground  
(漁場データと衛星データの比較が重要)

2012/10/26 NOAA/AVHRR SST image and fishing ground (Blue - Red : cold - warm)

▲ : Saury fishing ground ● : Skipjack fishing ground



## Ocean color data for fisheries



■ Phytoplankton is related to food environment  
(プランクトンは魚のえさの指標)

■ Saury fishing ground were formed in high chlorophyll area, Skipjack were formed low chl-a area.

■ Ocean color is very useful information (海色は極めて利用価値が高い)

Red tide(赤潮), Primary Production(基礎生産), SS (suspended solution), CDOM (colored dissolved material) (溶存物質など)...

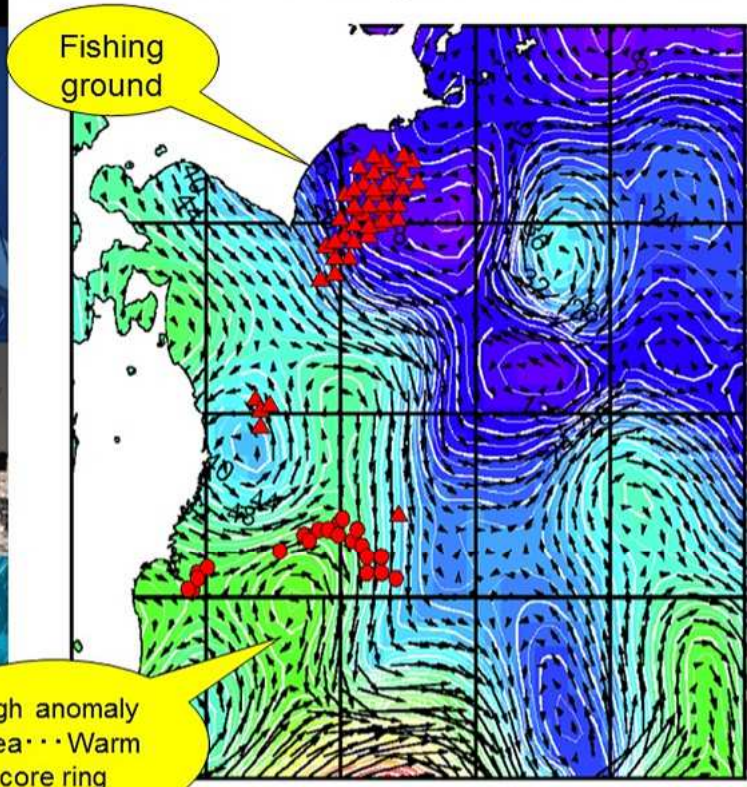
2012/10/26 TERA/MODIS Chlorophyll-a image and fishing ground

▲ : Saury fishing ground ● : Skipjack fishing ground (Blue - Red : High chl-a - Low chl-a)





# Sea Surface height data for fisheries



2012/10/26 Sea Surface height anomaly image and fishing ground (Skipjack and saury)

▲ : Saury fishing ground

● : Skipjack fishing ground

Skipjack fishing ground were formed around high anomaly area.

(カンオ漁場は偏差の高い場所に形成されてる)

Saury were formed in low anomaly area. (サンマは逆)

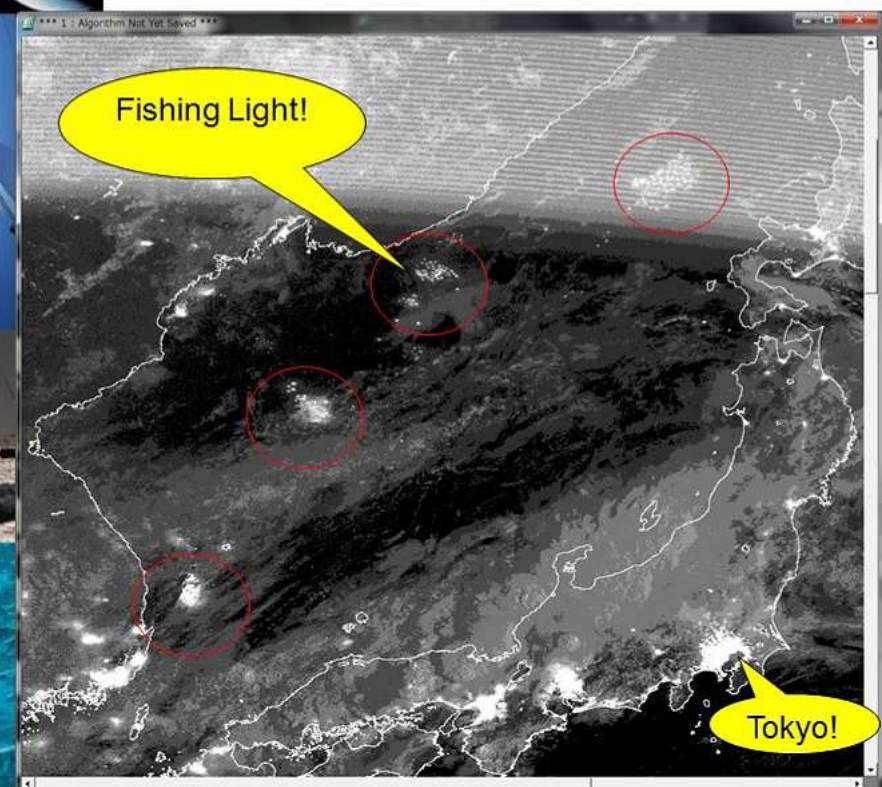
High anomaly area ≡ Warm core ring area

Direction is important too.

(Blue - Red : High SSH - Low SSH)



# Night light image (visible image)



## NPP/VIIRS DNB image (夜間可視画像)

2014/8/16

NPP/VIIRS observes night lights

Night light ...

City light

Forest fire

Fishing light

(夜の光といえば...街の灯りや森林火災や集魚灯)

Fisherman likes this image.

漁場の位置は秘密情報。でも他人がどこで操業しているか知りたい

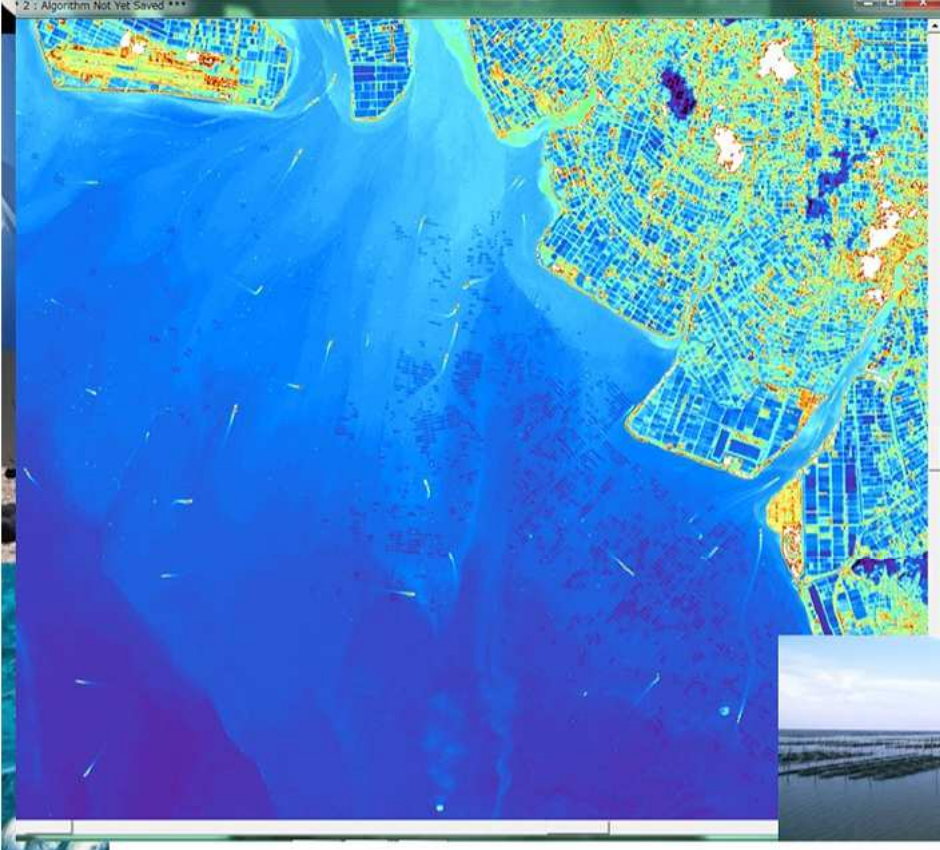
Illegal ship monitoring

不審船監視にも





### High resolution image for fisheries (Landsat8/OLIの利用)



LANDSAT8/OLI

Band8

15m resolution

2015/3/25

Ariake sea

(Yanagawa)

Floating cultivation  
(seaweed)

Ship

(海苔漁具や船が見える)

High resolution

data =

Became easily

available

(高解像度データは入手し  
やすくなった!)



### The MSDI for fisheries damages

(環境分野にも応用されるMSDI・・・漁業被害対策)

**The MSDI is used in marine environment monitoring.**

(MSDIは漁場ばかりではなく、環境モニタリングにも活用される)

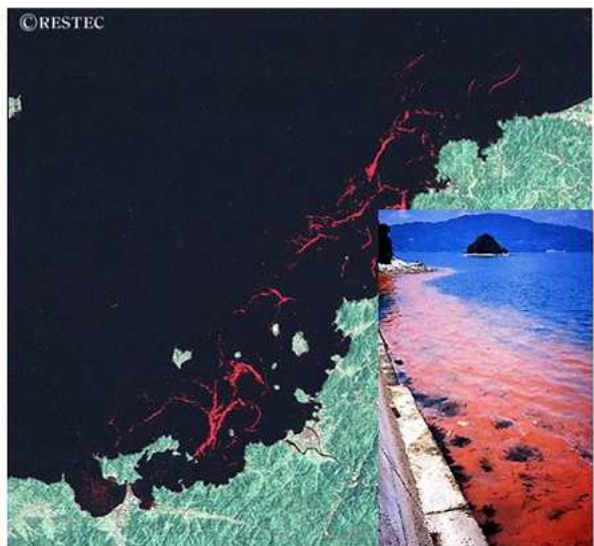
Fishery damage caused by red tide and jellyfish is serious in Japan.

The MSDI is essential to monitoring and mitigation fishery damage.

(赤潮やクラゲは漁業被害を引き起こすが、これらの監視にもMSDIは重要)

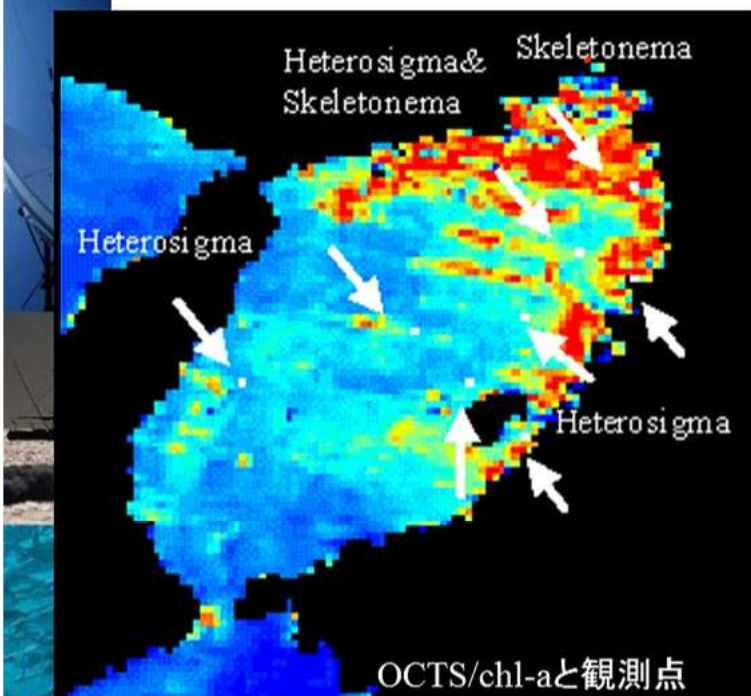


Giant jellyfish(2009, Iwate)

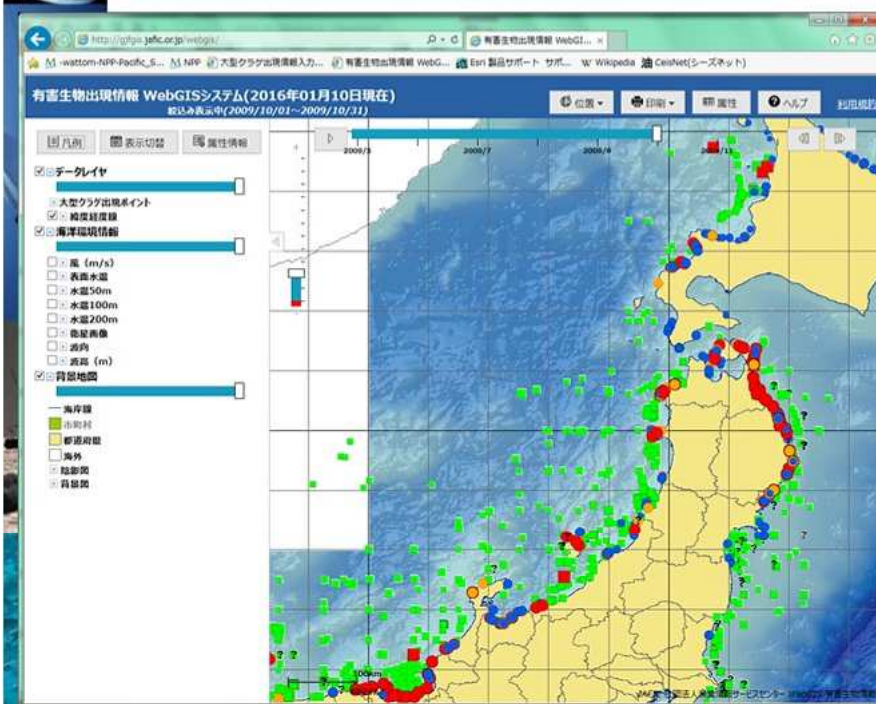
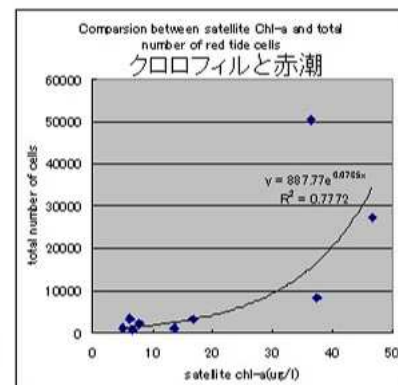
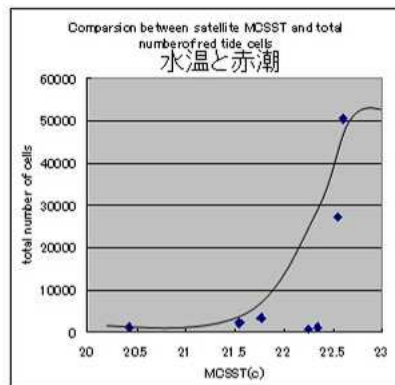


Red tide





Chlorophyll-a image and Red tide distribution in Osaka bay (大阪湾の赤潮と海洋環境)



Giant jelly fish Web-GIS・・・2009map(Outbreak year)  
 (大型クラゲ情報配信Web-GIS)

Total environment system (総合的なシステムとして開発)

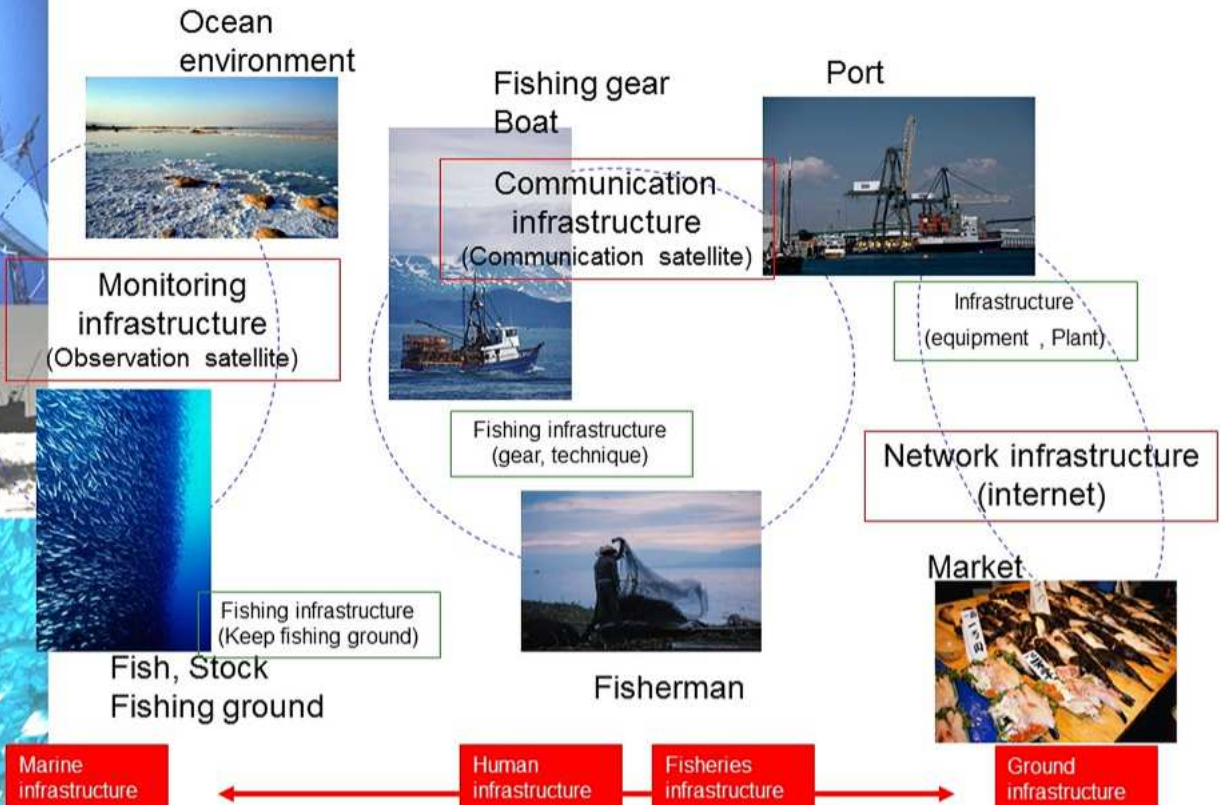
- Species(種類)
  - Jelly fish
  - Red tide
  - Shark ...etc.
- Environment(環境)
  - Temperature
  - Ocean Color
  - Weather data
  - Bathymetry data
- Web-GIS
  - Online data
  - Local data
  - オンライン化を想定



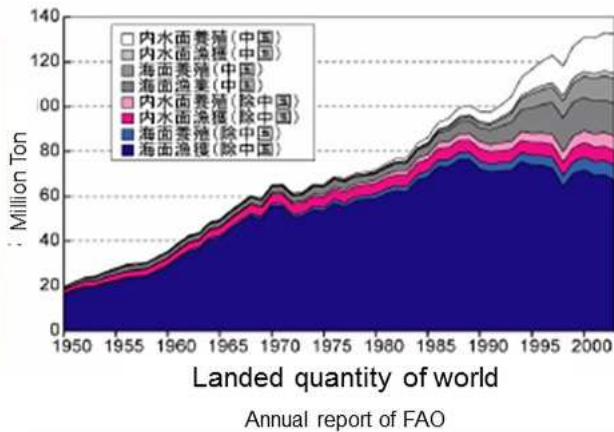


IHO MSDI Industry Demonstration Workshop and Open Forum  
**Infrastructure improvement for fisheries**

(漁業のための基盤整備は多岐に渡る)



IHO MSDI Industry Demonstration Workshop and Open Forum  
**Conclusion and Discussion** (終わりに)



Fisheries production of the world is increasing.  
 Especially, developing countries.  
 世界の漁業生産は増加傾向、途上国が漁獲を増やしている  
 食料問題を考える上でも漁業は重要

- **Fisheries is important for food problem in the 21C**
  - In Japan, fisheries is base industry. (漁業は日本の基盤産業)
  - The MSDI supports Japan fisheries. (MSDIは漁業を支える)
- **The MSDI is related with national interest**
  - Japan's EEZ, which is the world's sixth largest in area.
  - For EEZ monitoring, the MSDI is essential (more quick and accurate)  
 (世界第6位のEEZを抱える日本、EEZの監視にMSDIは必須、それは国益に直結する)