

# Update of the Chinese ocean color satellite mission

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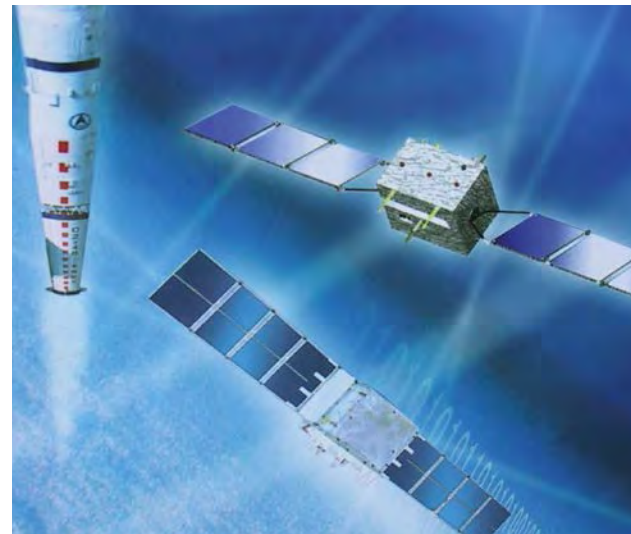


# Contents

- The past missions (HY-1A/1B)
- The coming missions (HY-1C/1D)
- The data processing system for HY-1C/1D

# First Ocean color Satellite (HY-1A)

- China launched the first ocean satellite HY-1A on 15 May, 2002, together with meteorological satellite FY-1D using same rocket
- HY-1A was an experimental ocean color satellite in China, and successfully operated for about two year (2002.5-2004.4)



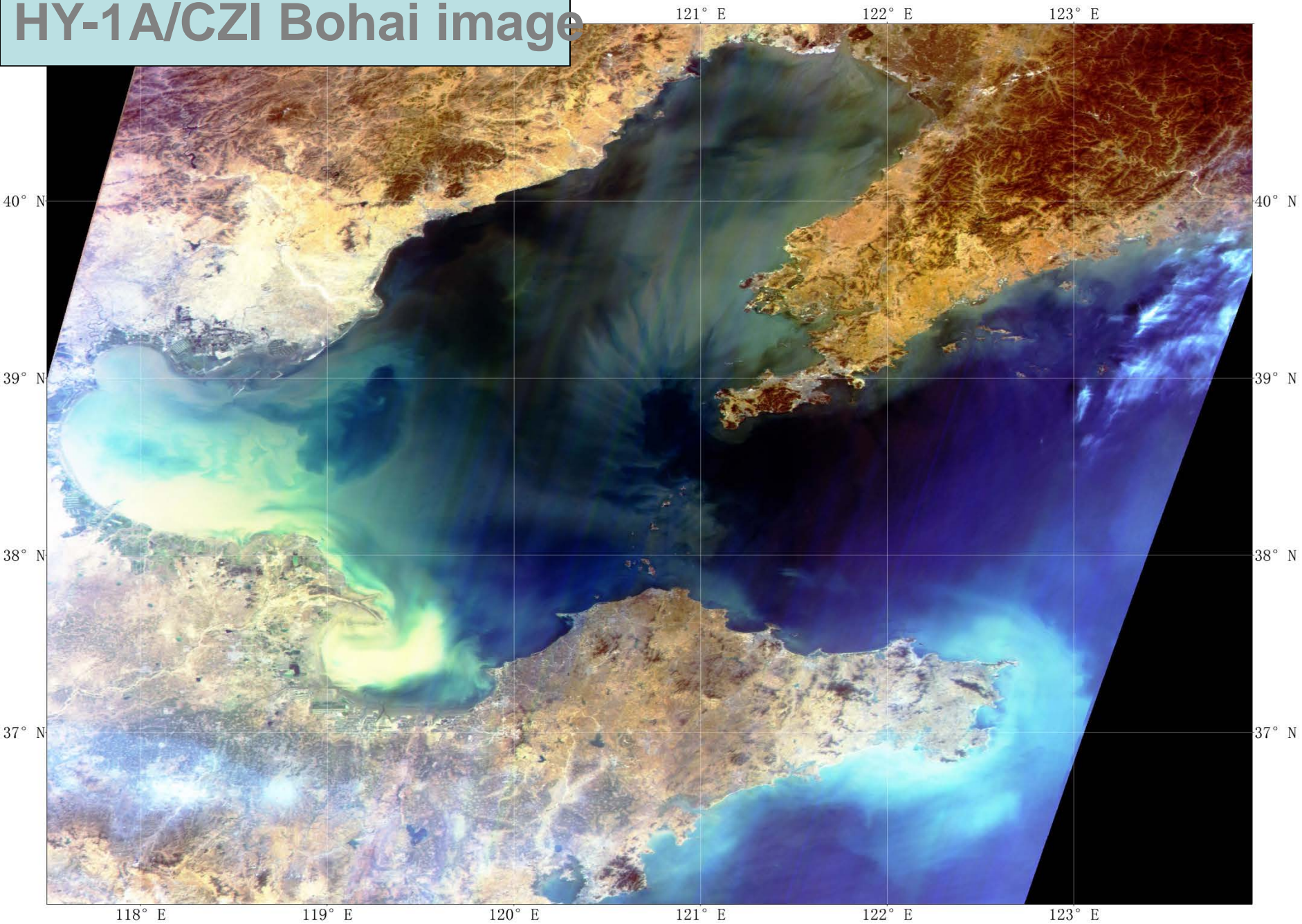
# HY-1A satellites

1. **COCTS**- Chinese Ocean Color and Temperature Scanner (Ten bands)
2. **CZI**- Coastal Zone Imager (4 bands CCD Camera)

# COCTS bands and detecting object

<b>Band ( micro m )</b>	<b>Main detecting object</b>
<b>0.402~0.422</b>	<b>Yellow substance、 water pollution</b>
<b>0.433~0.453</b>	<b>Chlorophyll absorption</b>
<b>0.480~0.500</b>	<b>Chlorophyll、 sea ice、 pollutant</b>
<b>0.510~0.530</b>	<b>Chlorophyll、 water depth、 pollutant、 suspended sediment</b>
<b>0.555~0.575</b>	<b>Chlorophyll、 vegetation、 sand</b>
<b>0.660~0.680</b>	<b>Fluorescence、 suspended sediment、 atmospheric correction、 aerosol</b>
<b>0.740~0.760</b> <b>0.730~0.770</b>	<b>Suspended sediment、 atmospheric correction、 vegetation</b>
<b>0.845~0.885</b>	<b>Atmospheric correction、 water vapor</b>
<b>10.30~11.40</b>	<b>Surface temperature</b>
<b>11.40~12.50</b>	<b>Surface temperature</b>

# HY-1A/CZI Bohai image



Images courtesy of Dr.

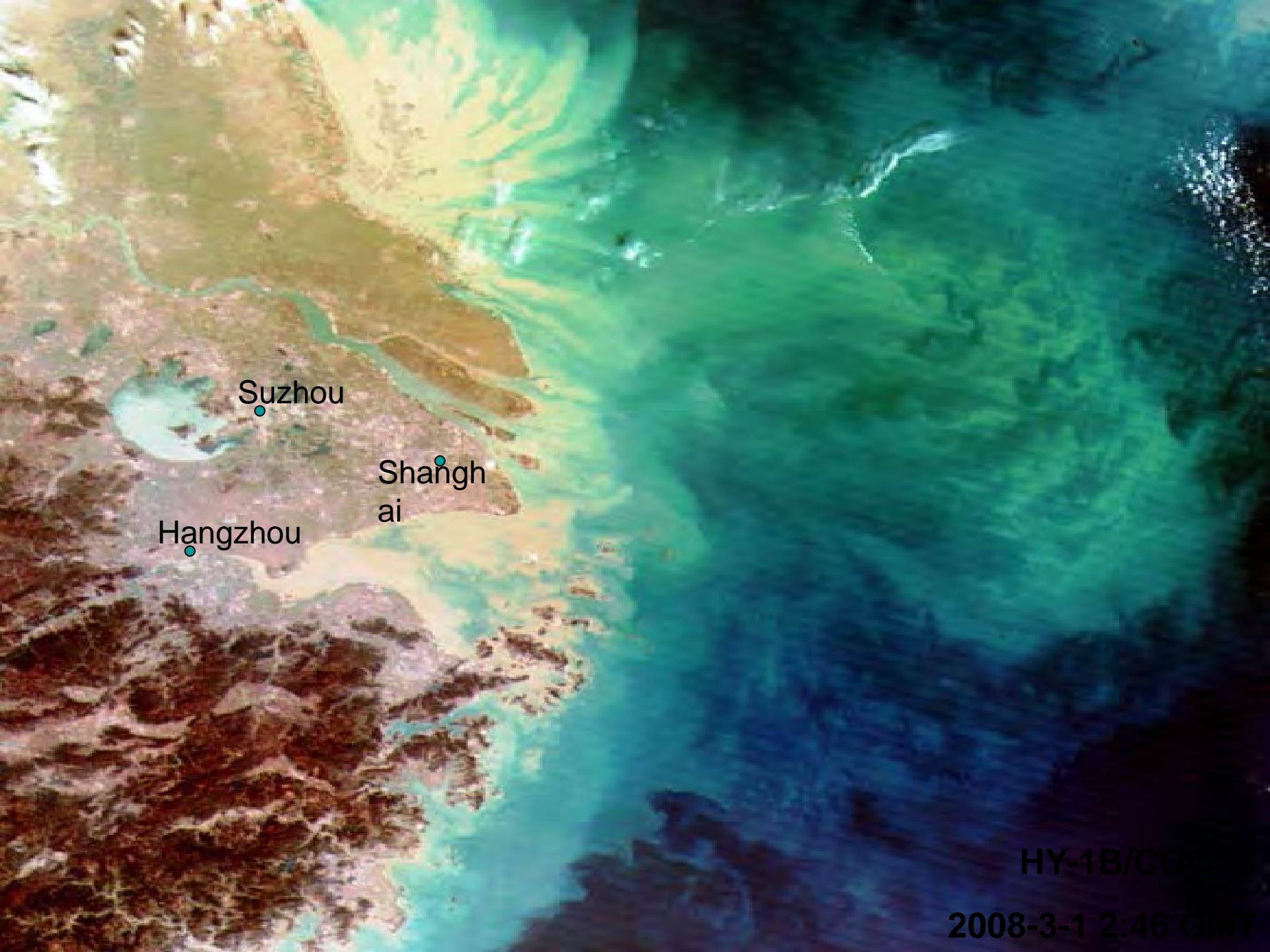


# HY-1B satellite

**Second** ocean color satellite of China, **HY-1B** was launched by Long March rocket, in April, 2007.

**Sponsored by:** State Oceanic Administration, (SOA) **Manufacturer:** the Chinese Academy of Space Technology (CAST)





Suzhou

Shanghai

Hangzhou

HY-1B/CODRIS

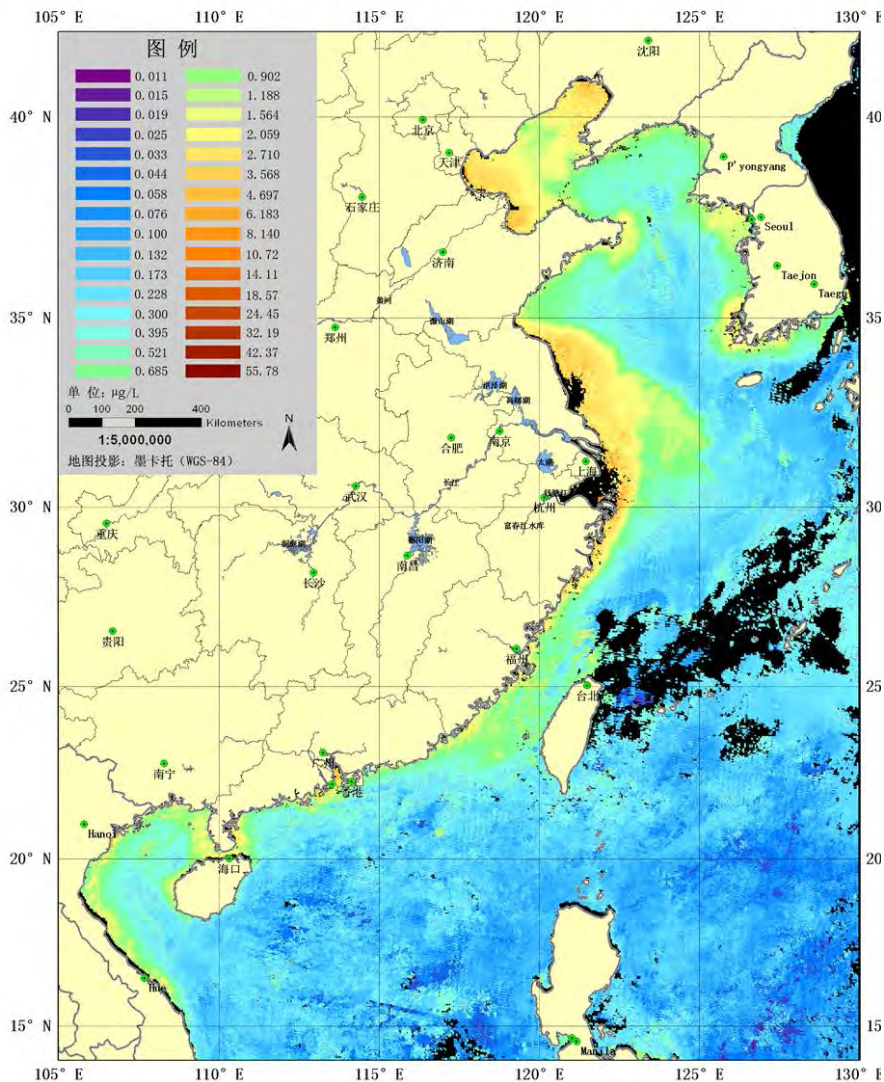
2008-3-1 2:46 GMT



# Comparing of HY-1B/COCTS and Aqua/MODIS (Chl\_a)

卫星遥感水体叶绿素浓度专题图

(资料时间: 年 月 日- 年 月 日)

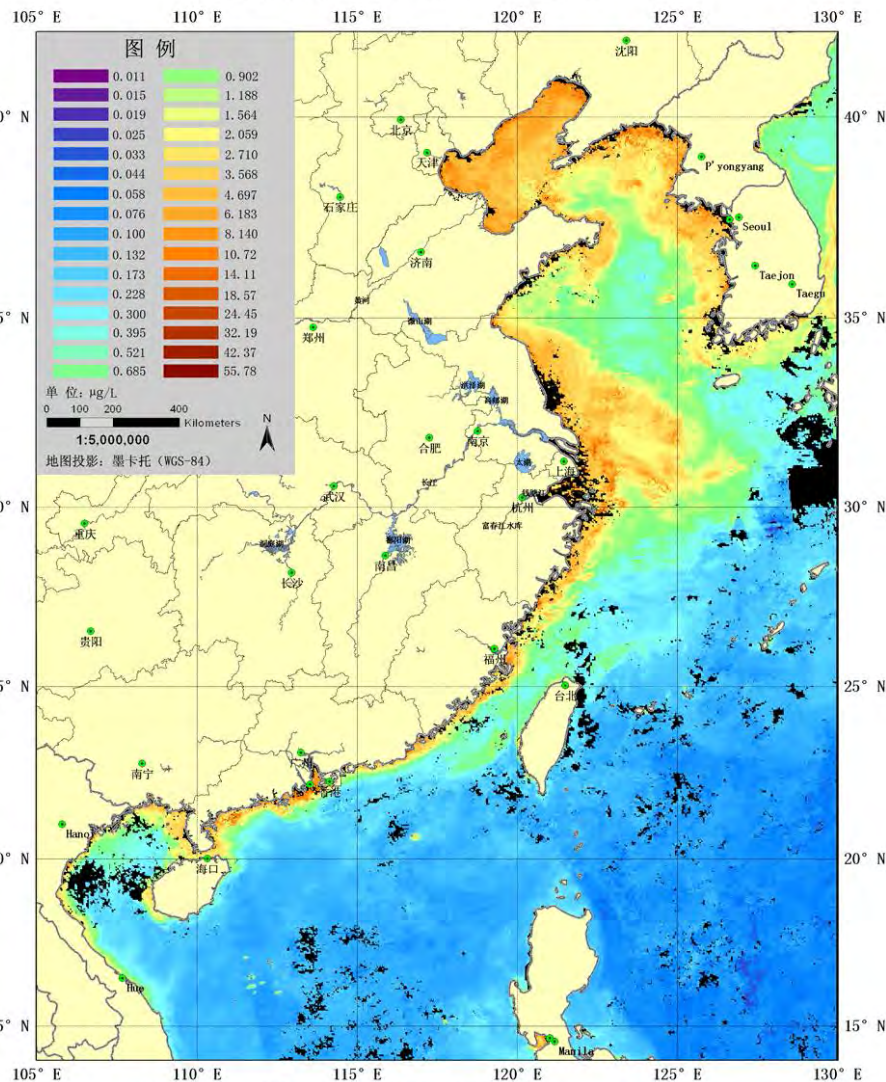


制作时间: 年 月 日 制作单位: 国家海洋局第二海洋研究所

May, HY-1B/COCTS

卫星遥感水体叶绿素浓度专题图

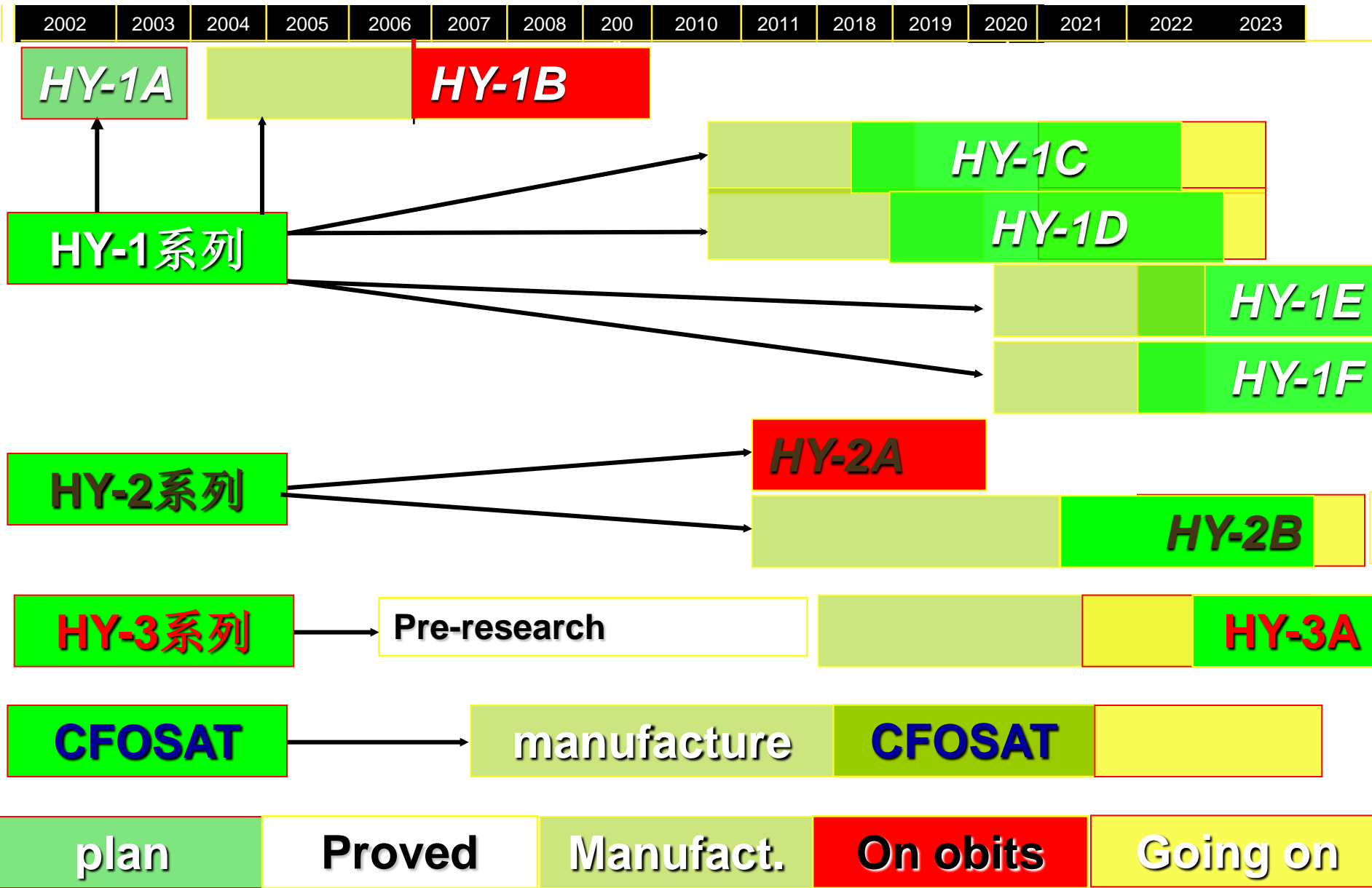
(资料时间: 年 月 日- 年 月 日)



制作时间: 年 月 日 制作单位: 国家海洋局第二海洋研究所

May, Aqua/MODIS

# HY ocean satellite missions



# HY-1C/1D satellites

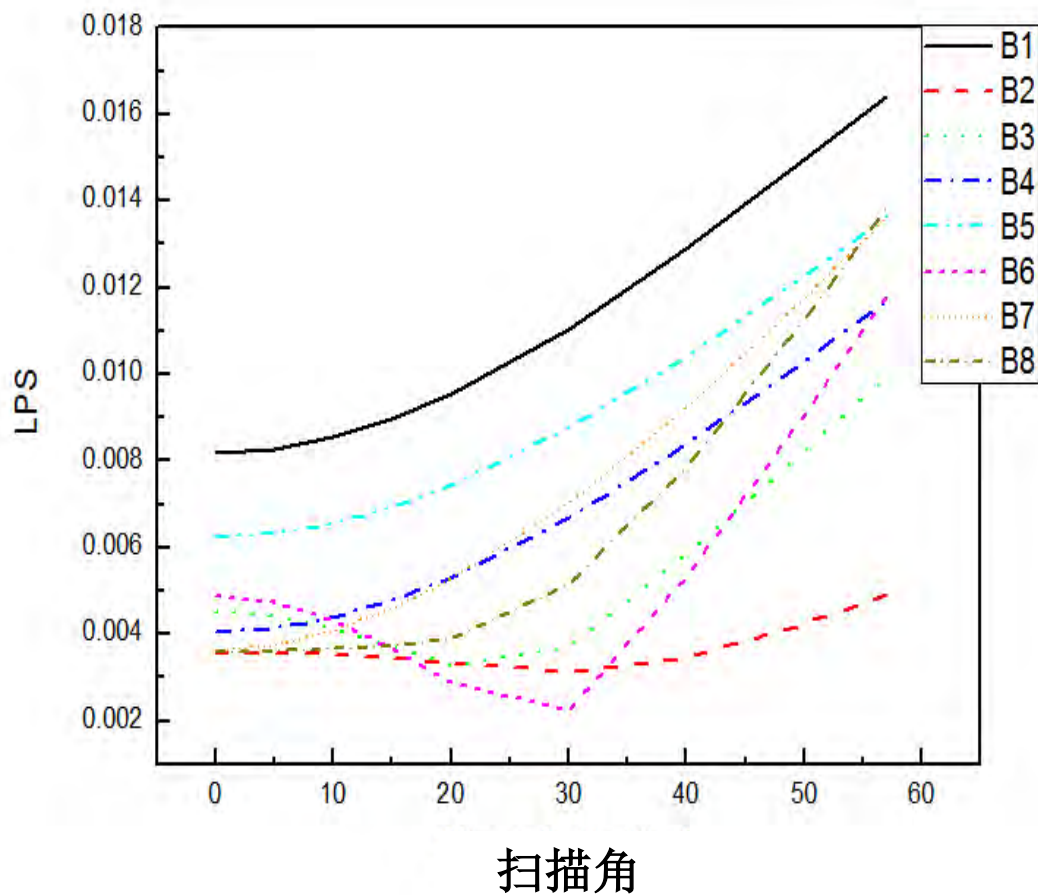
The morning-satellite (HY-1C ) and afternoon-satellite (HY-1D) will be launched in 2018.

1. COCTS- Chinese Ocean Color and Temperature Scanner (Ten bands)
2. CZI- Coastal Zone Imager (4 bands CCD Camera)
3. UV sensor (2 Ultraviolet bands)
4. An on-board calibration system

# COCTS for HY-1C/1D



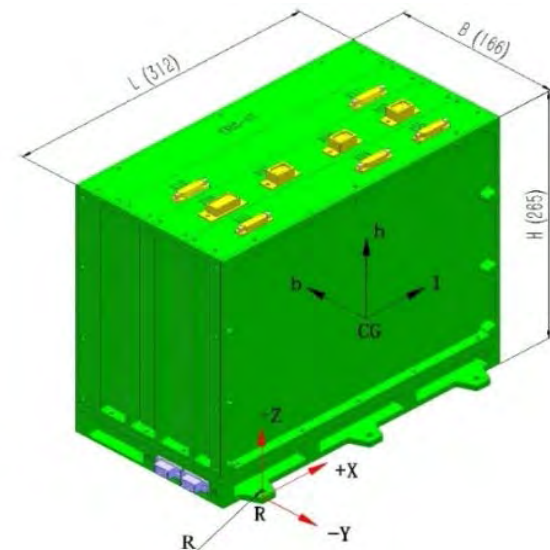
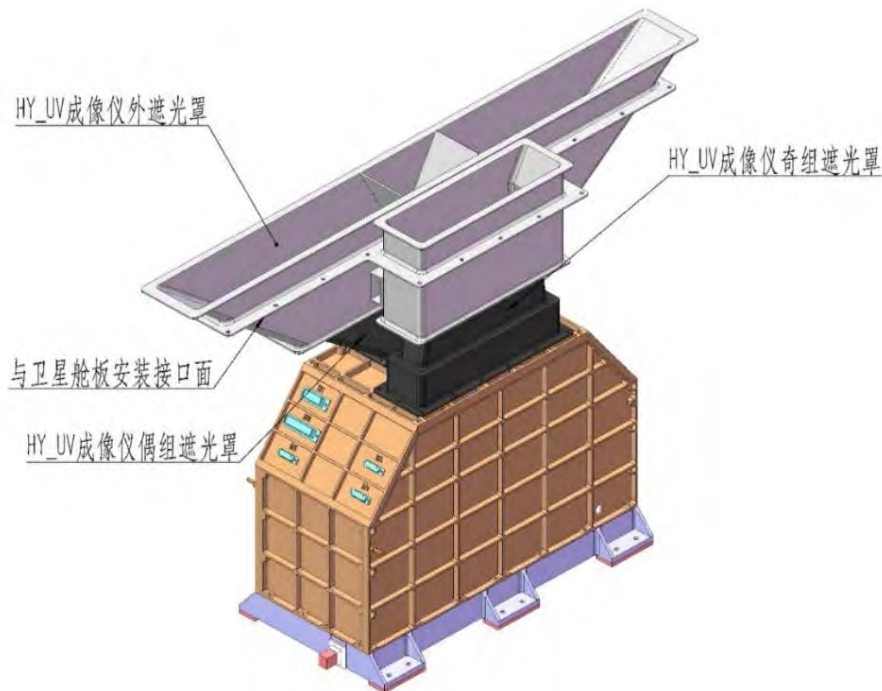
# LPS test results



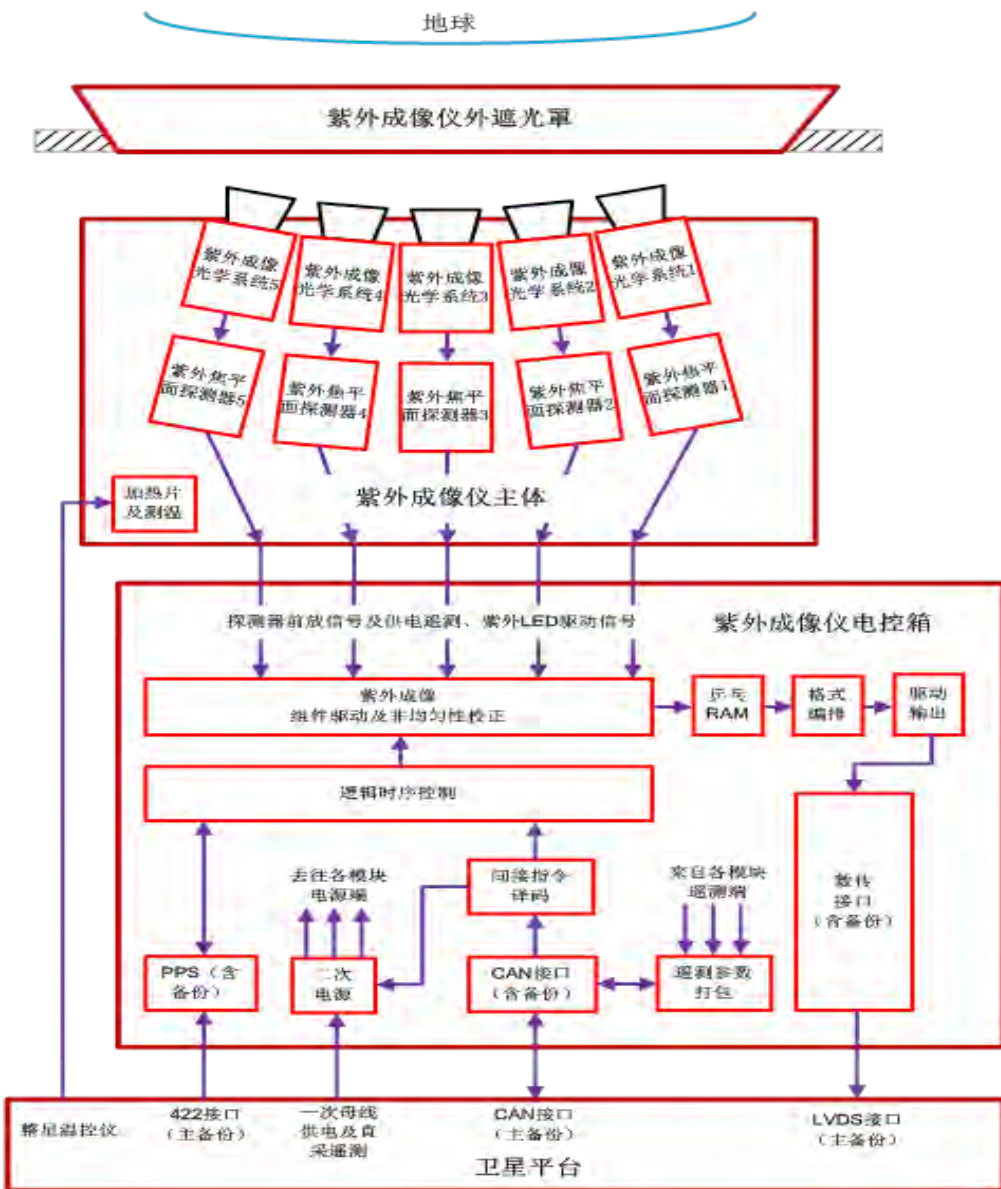
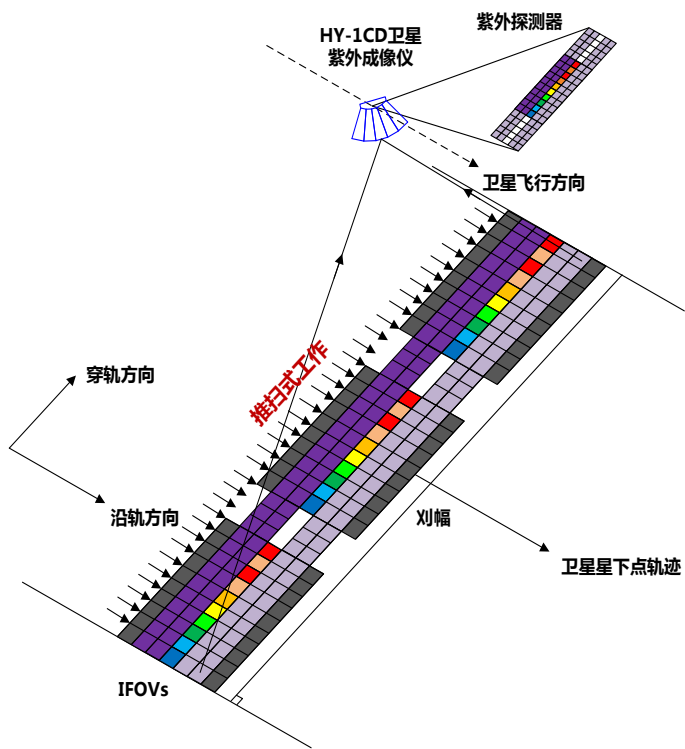
Band	LPS
<b>B1</b>	<b>1.54%</b>
<b>B2</b>	<b>1.35%</b>
<b>B3</b>	<b>1.37%</b>
<b>B4</b>	<b>1.74%</b>
<b>B5</b>	<b>1.66%</b>
<b>B6</b>	<b>1.56%</b>
<b>B7</b>	<b>1.30%</b>
<b>B8</b>	<b>1.32%</b>

# A UV sensor on HY-1C/D

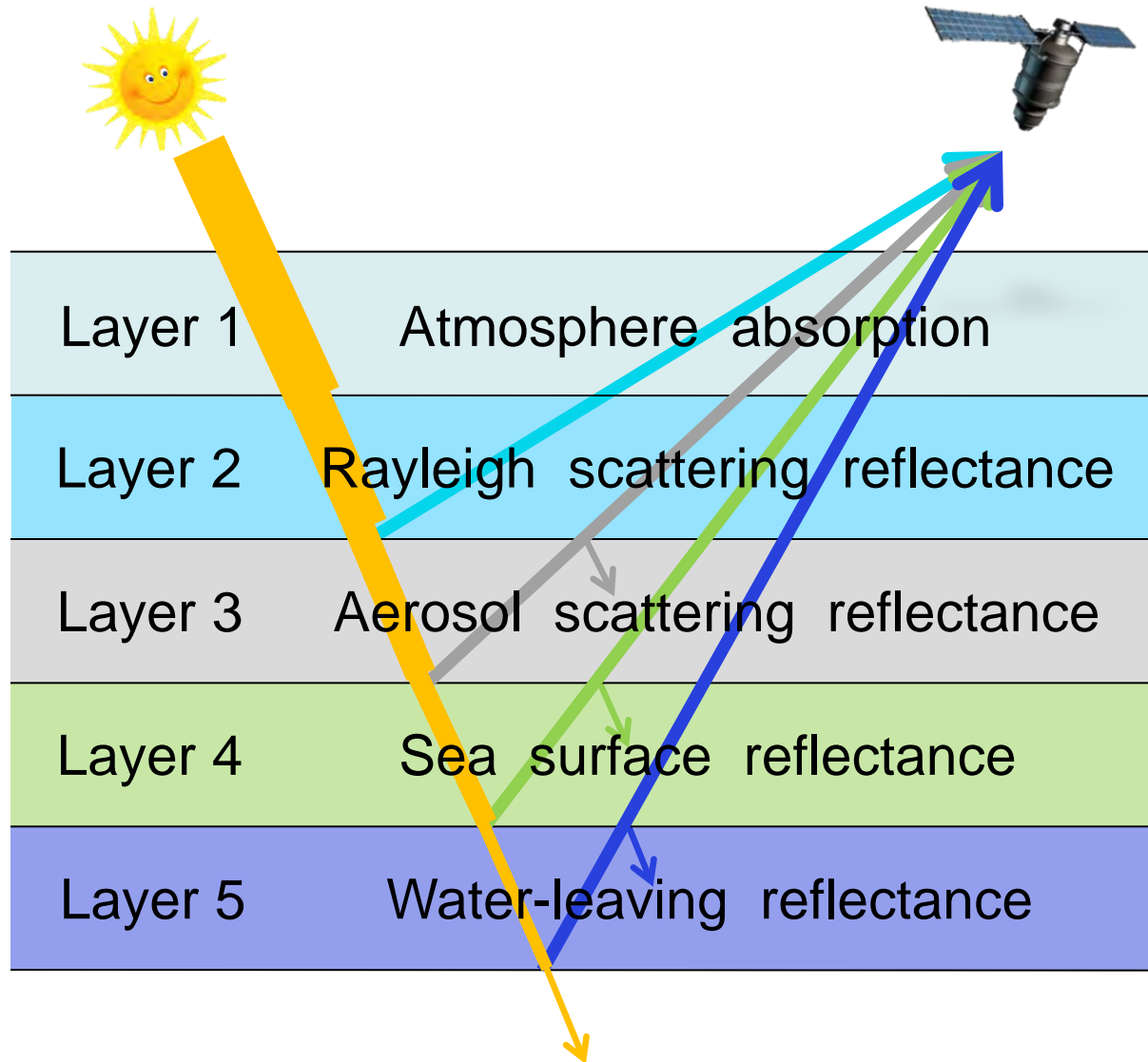
编号	中心波长 (um)	带宽 (um)	典型辐亮度 (mW/cm <sup>2</sup> umSr)	信噪比 (SNR)	最大辐亮度	应用对象
1	0.355	0.02	7.5	≥1000	35.6 /18.5	浑浊水体大气校正, 可溶性有机物
2	0.385	0.02	6.1	≥1000	38.1 /16.5	浑浊水体大气校正, 可溶性有机物, 海洋 溢油



# The structure of the UV sensor



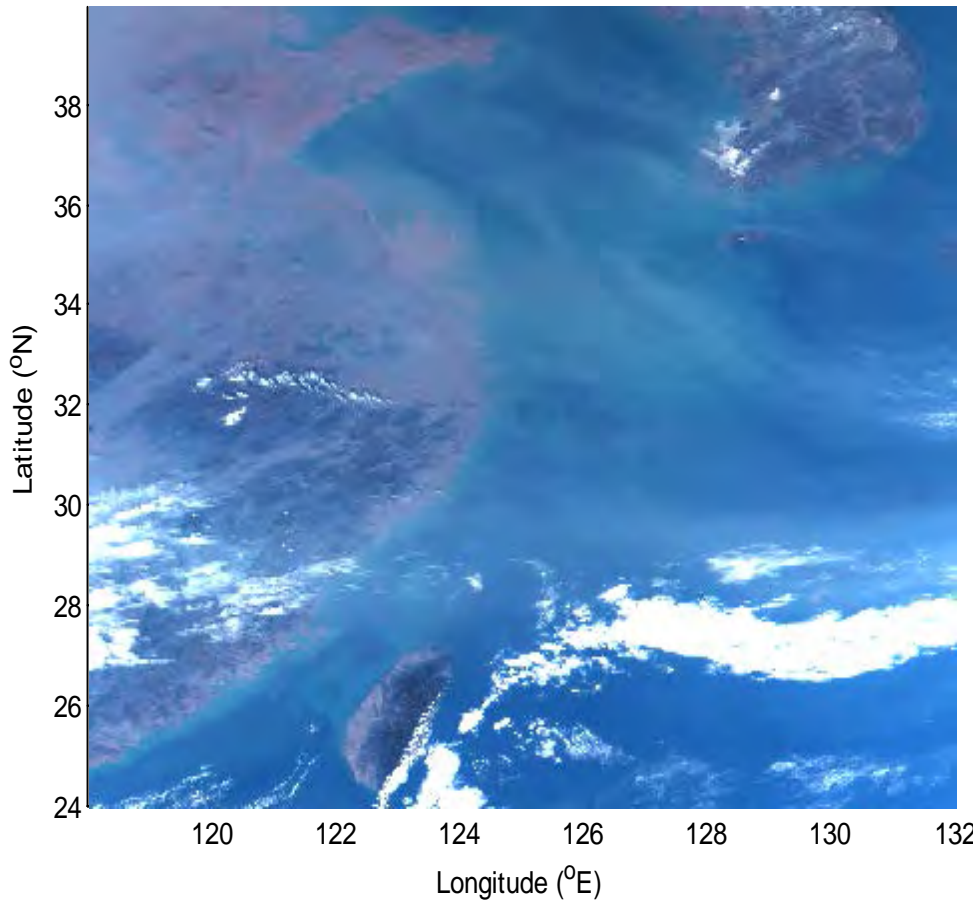
# A new data processing system for HY-1C/1D



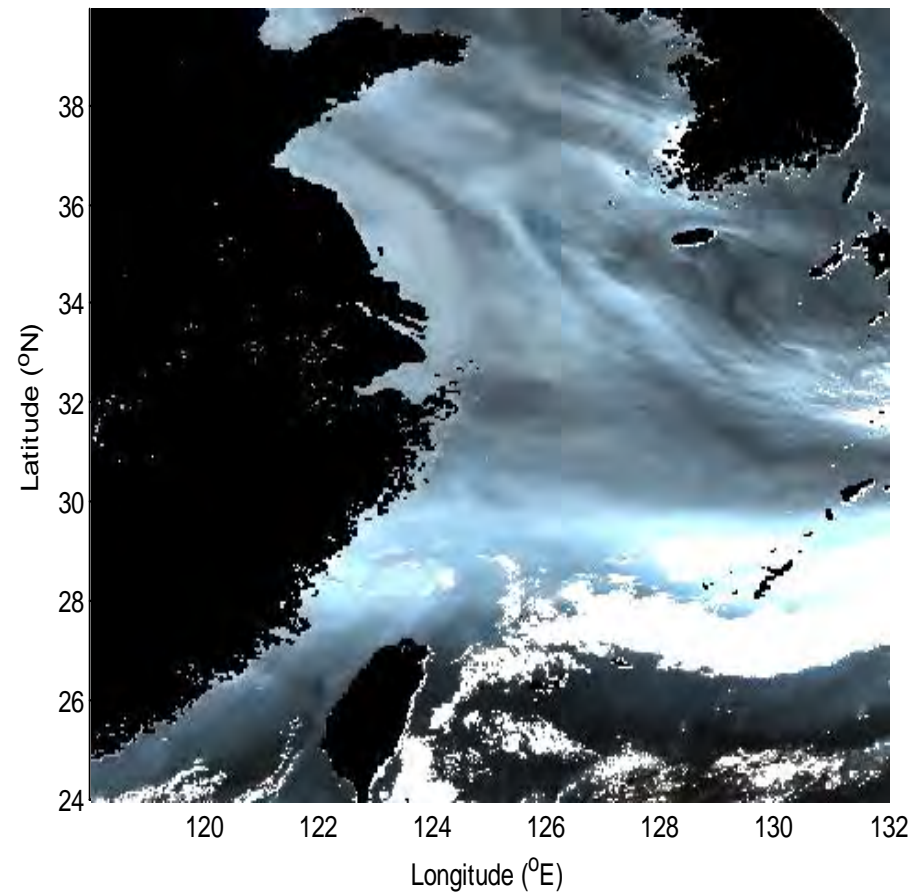


# A test of the system

Original

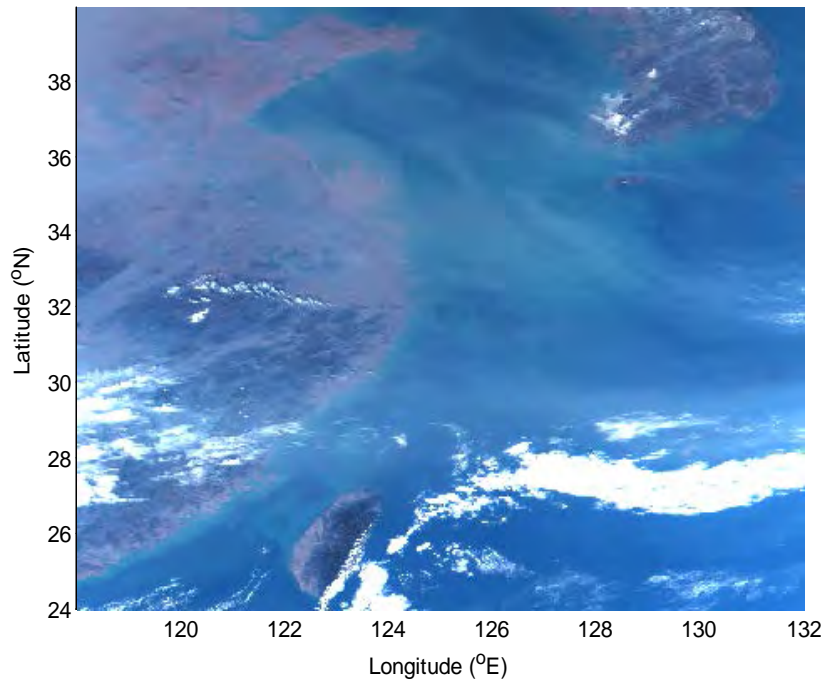


Aerosols

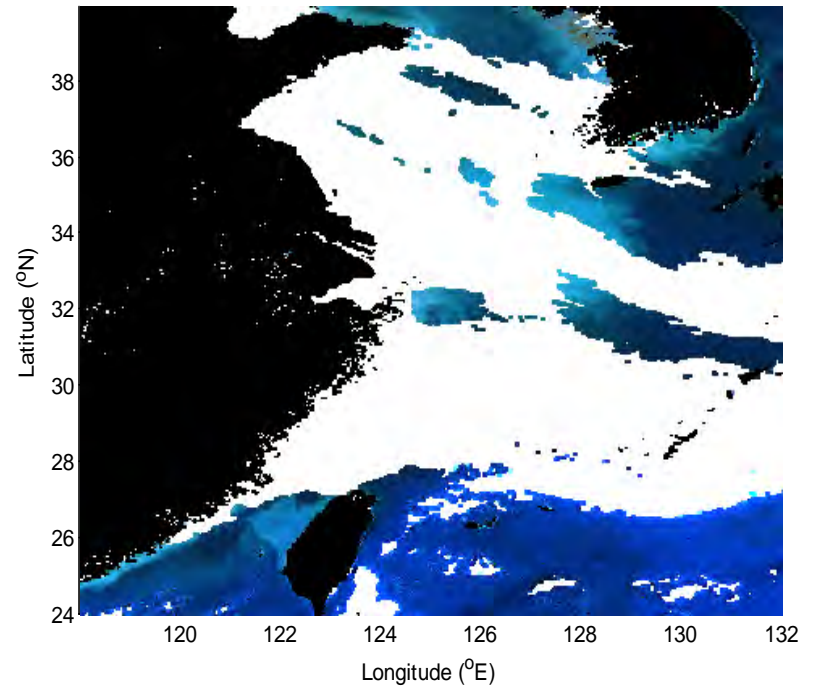


# The standard products

original

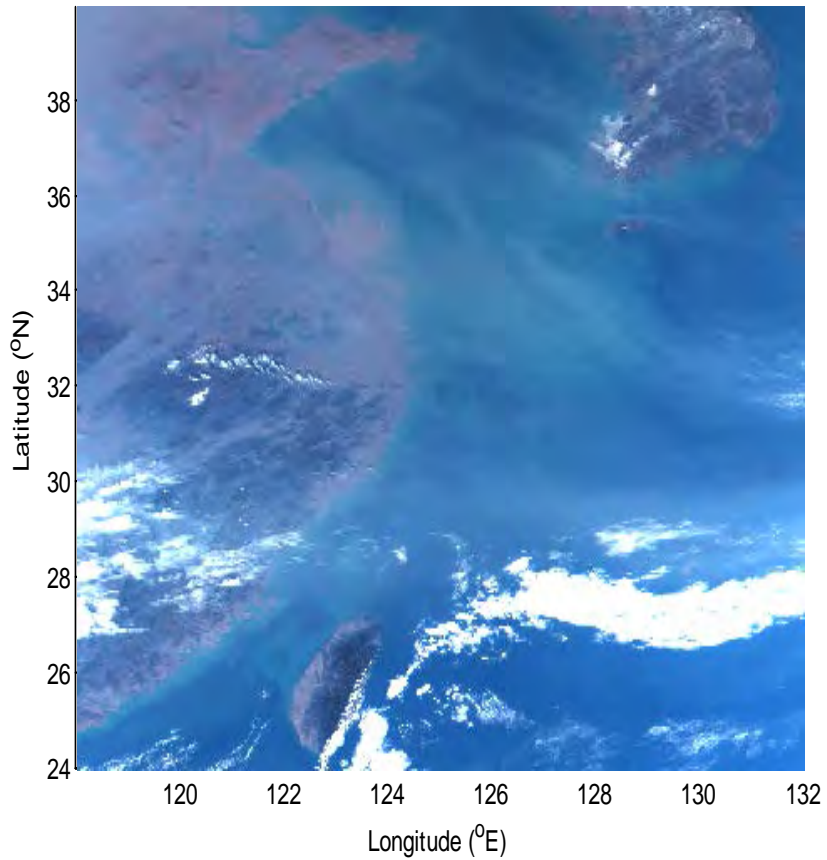


Water-leaving

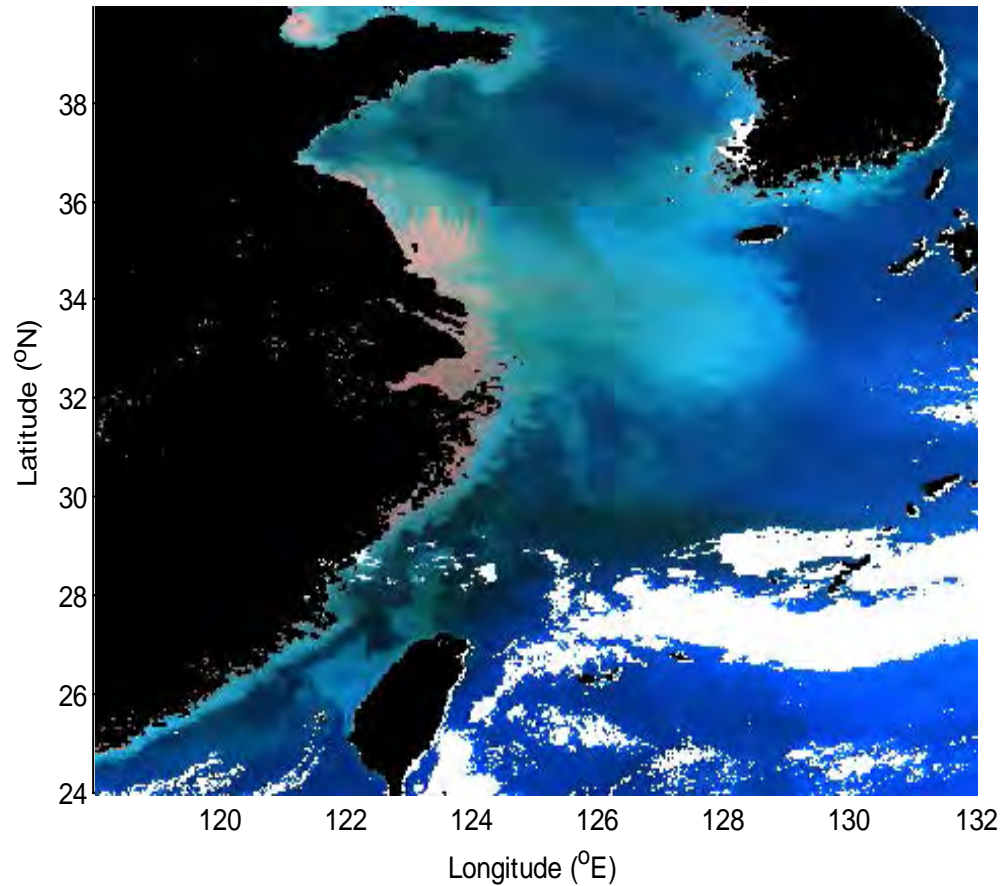


# Result of the system

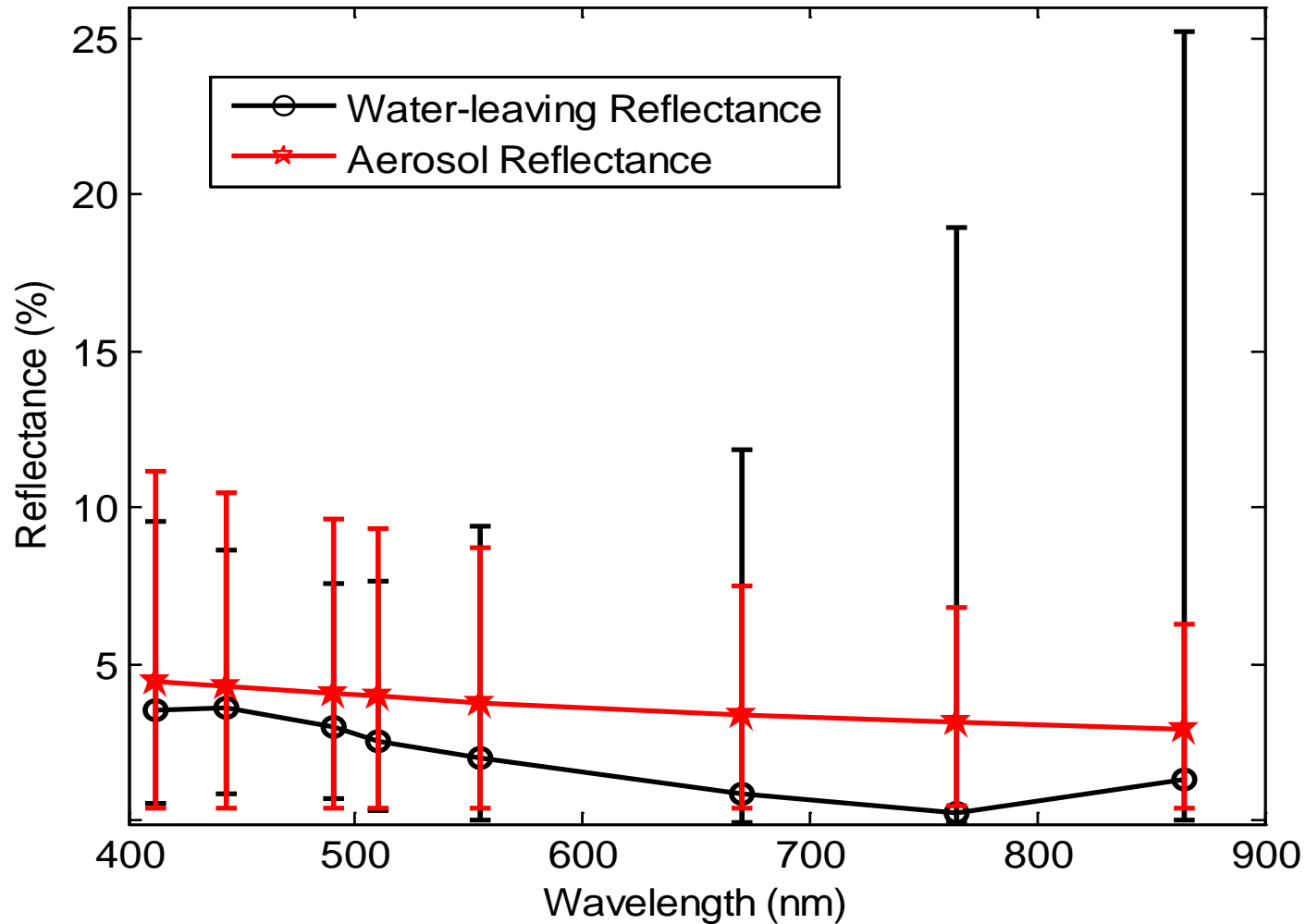
Original



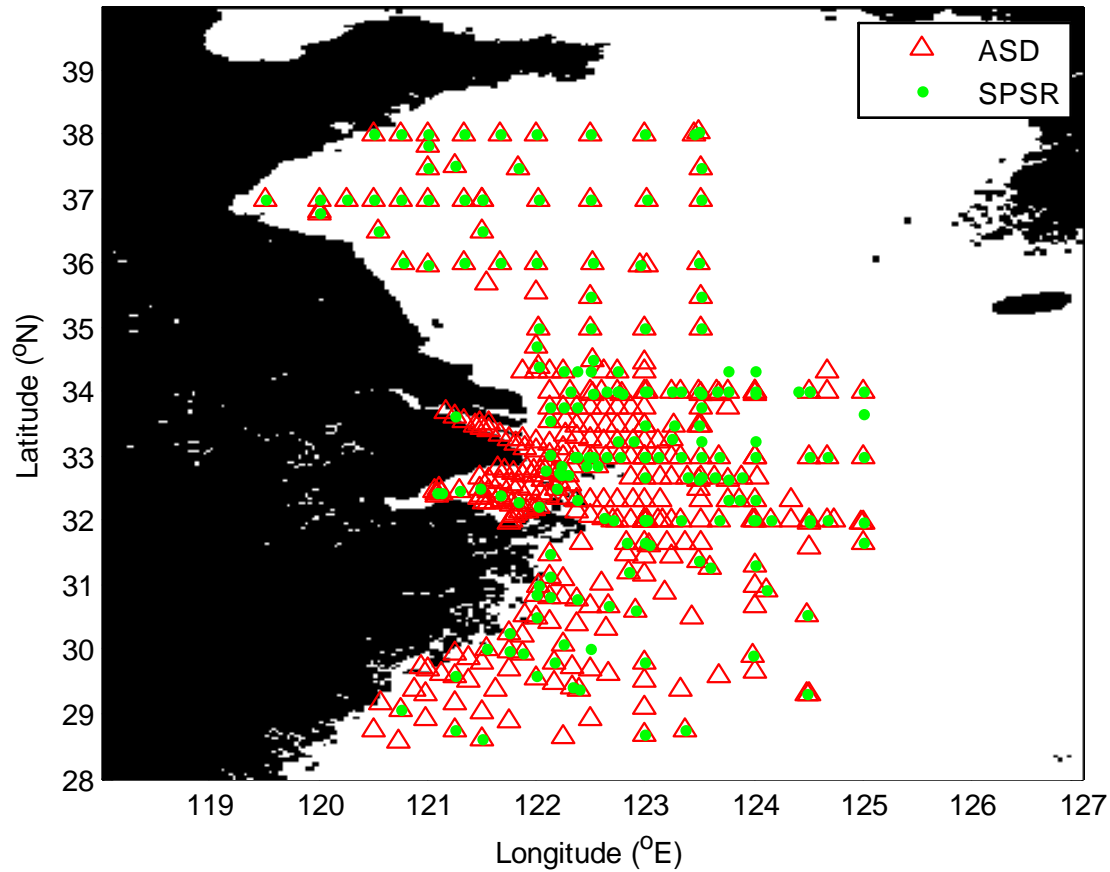
Water-leaving



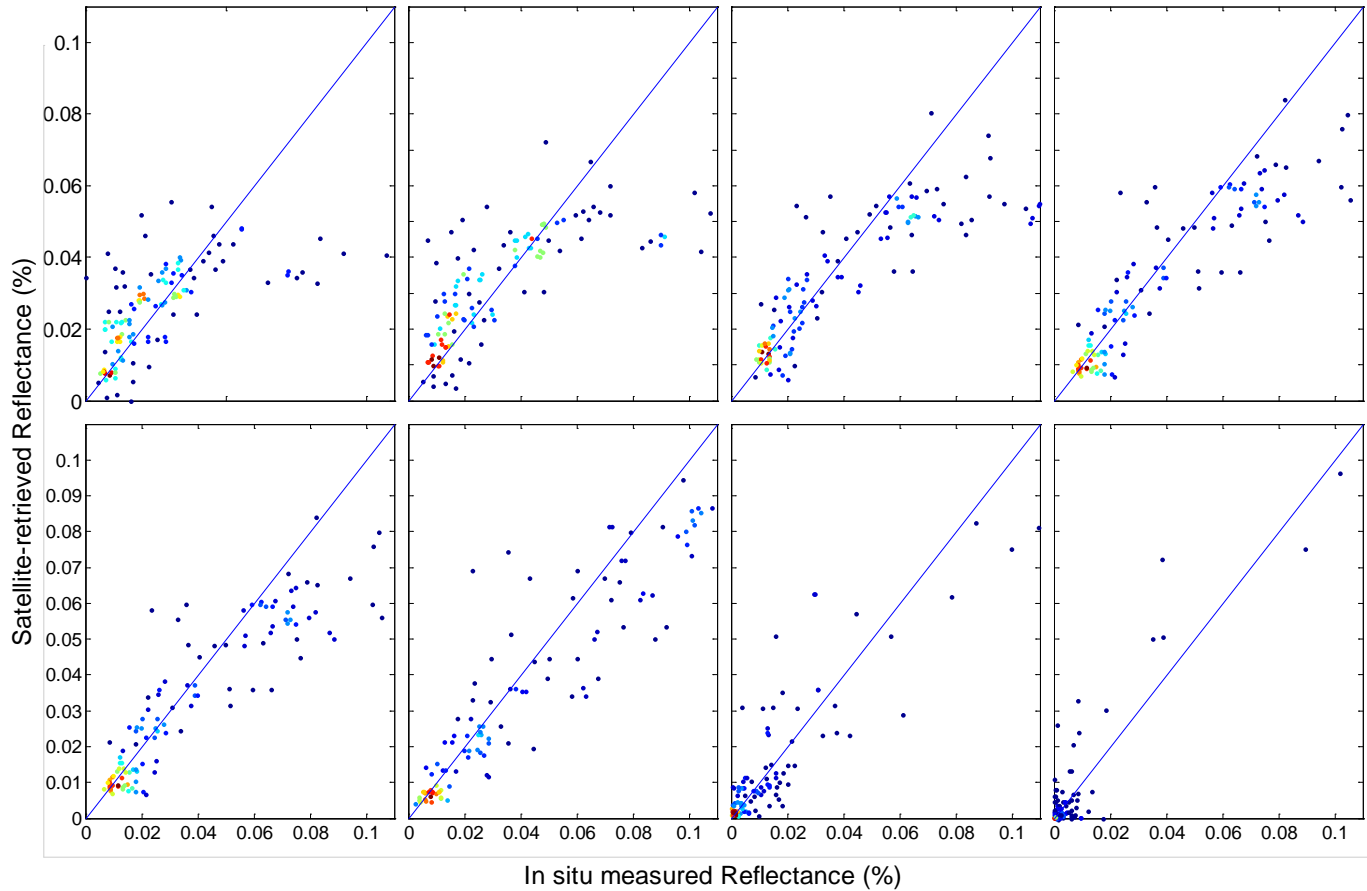
# Comparison between aerosol and water-leaving reflectance



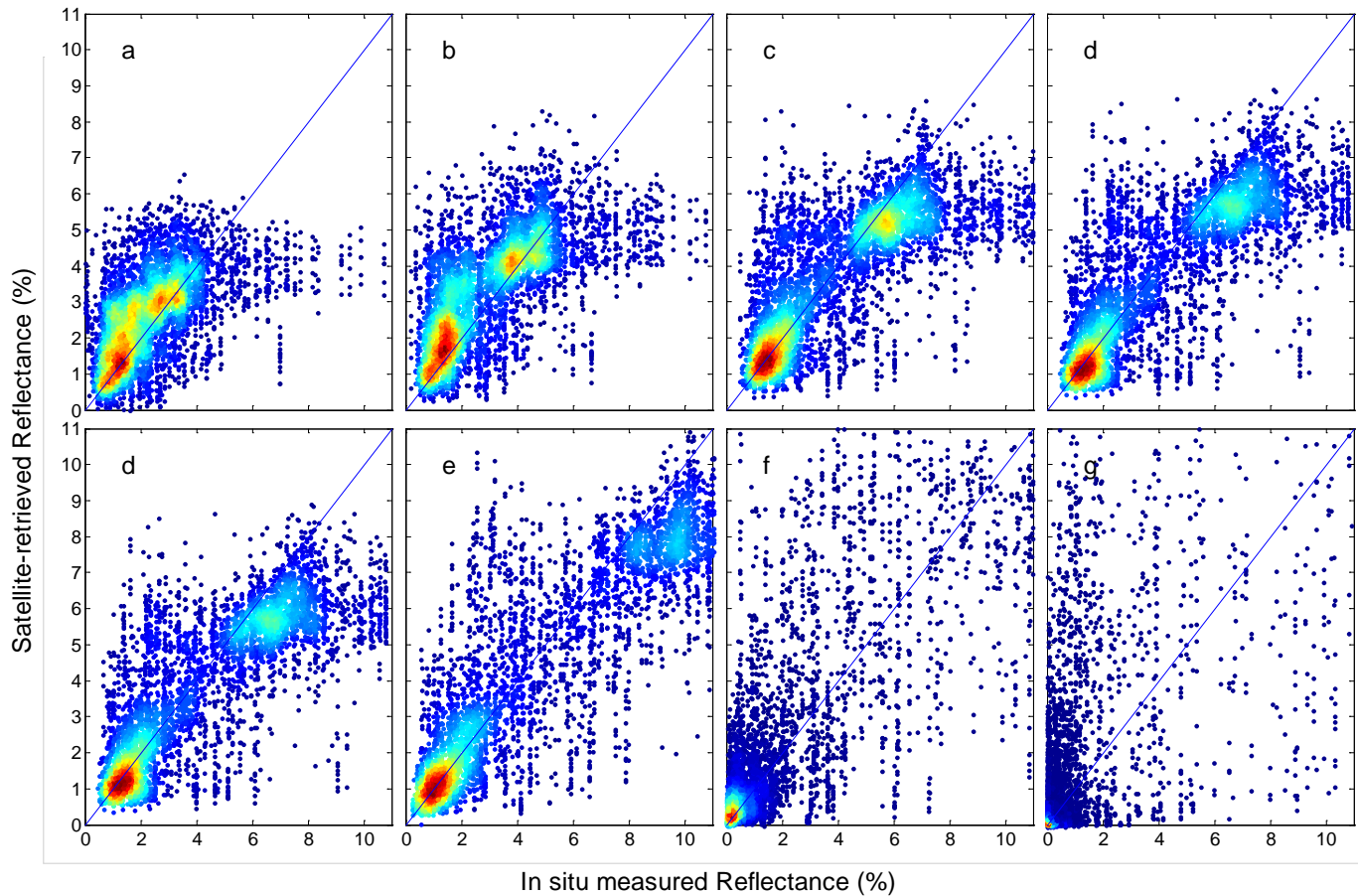
# In situ measurements (865 stations)



# Validation (122 pairs, 3-h)



# Validation (3751 pairs, 15-day)



# Access HY-1/HY-2 data

The screenshot shows the website interface for the National Satellite Ocean Application Service. The header includes the logo and the text "国家卫星海洋应用中心 National Satellite Ocean Application Service". A navigation menu at the top lists: 首页, 中心简介, 新闻中心, 卫星工程, 定向服务, 专项工程, 应急监测, 学术动态, 留言板. The main content area is titled "数据分发流程" (Data Distribution Process) and contains the following text:

国家卫星海洋应用中心业务处负责组织中心对外的卫星数据分发业务。用户根据自己的需求，向业务处提出申请，经业务处审核并报中心领导批准后，与用户签订协议。业务处根据用户的需求向中心各业务部门下达任务单。任务完成后，由业务处通知用户办理取货手续。具体步骤如下：

1. 数据查询。查询方式有两种：第一，用户登录到国家卫星海洋应用中心网站（www.nsoas.gov.cn），查询有关产品数据信息，确定自己的数据需求；第二，用户直接到国家卫星海洋应用中心来查询需求数据。
2. 订单提交。用户根据需求，填写《卫星数据分发申请表》（该表可在中心网站上获取），向中心业务处提出申请，经中心业务处审核并报中心领导批准后办理相关收费手续。
3. 任务下达。中心业务处向各业务部门下达任务。承担任务部门根据订单要求安排人员进行产品制作。
4. 数据分发。承担部门完成任务后即通知业务处，最后由中心业务处与用户联系，将数据交付到用户手中。

Below the text is a flowchart illustrating the process:

```
graph TD; User([用户]); Center[国家卫星海洋应用中心业务处]; Dept[国家卫星海洋应用中心各业务承担部门]; User -- 提交订单 --> Center; Center -- 下达任务 --> Dept; Dept -- 任务完成 --> Center; Center -- 数据分发 --> User;
```

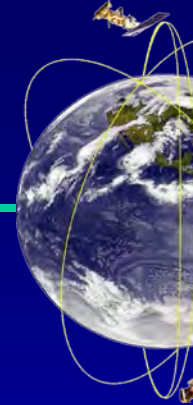
The flowchart is annotated with the following labels:

- User**: Corresponds to the "用户" node.
- Submit Application**: Corresponds to the "提交订单" arrow.
- Operational Office**: Corresponds to the "国家卫星海洋应用中心业务处" node.
- Data processing department**: Corresponds to the "国家卫星海洋应用中心各业务承担部门" node.
- Data Distribution (FTP or DVD)**: Corresponds to the "数据分发" arrow.

At the bottom of the flowchart, the text "数据分发业务流程图" is visible.

<http://www.nsoas.gov.cn>





谢谢!

海洋卫星遥感技术创新团队  
卫星海洋环境动力学国家重点实验室  
国家海洋局第二海洋研究所

