



20th CODATA GENERAL ASSEMBLY

Ladies and Gentlemen:





Proposal for New Task Group

Establishment

of the **C**omprehensive **I**nformation **S**ystem on
Natural **D**isaster **M**itigation
(**CISDM**)

Prof. Wang Ang-sheng

Director of CDR, CAS



Outline

- 1 BACKGROUND**
- 2 OBJECTIVE**
- 3 IMPLEMENTATION SOLUTION**
- 4 WORKING PLAN**
- 5 CO-CHAIRS & GROUP MEMBERS**



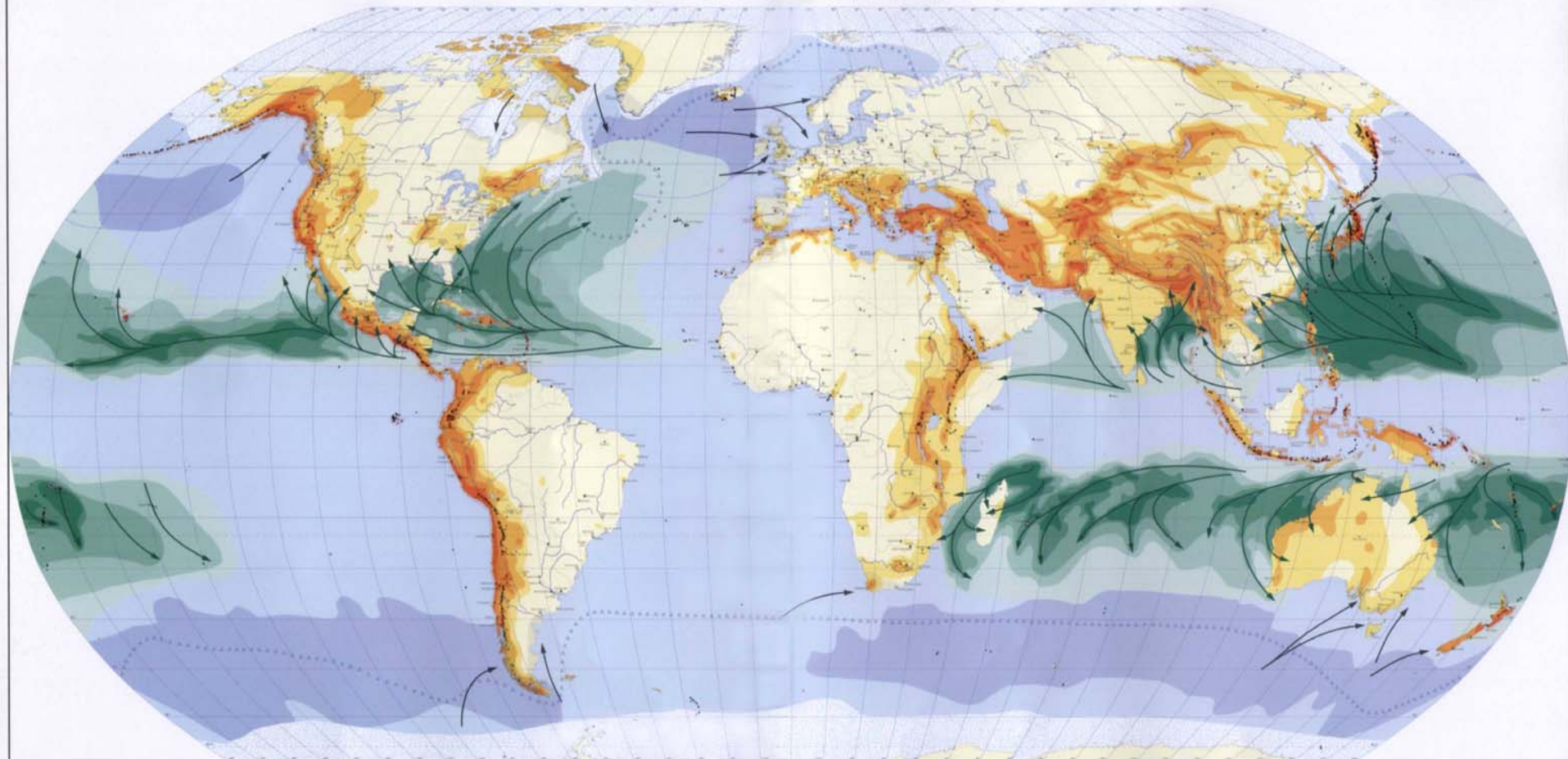
1 Background

- 1.1 We face various natural disasters**
- 1.2 Global efforts to disaster mitigation**
- 1.3 Summary of our own work in CAS**
- 1.4 Recent major disasters**
- 1.5 IAP and ICSU'S ACTIONS**



1.1 We are facing severe natural disasters

世界自然灾害分布图



<p>地震</p> <ul style="list-style-type: none"> 区域0 MMV级或V级以下 50年超越概率10%—相当于475年一遇-的地震在普通地质情况 区域1 MMVI级 区域2 MMVII级 区域3 MMVIII级 区域4 MMIX级或以上 <p>具有“墨西哥城”效应的大城市</p>	<p>火山</p> <ul style="list-style-type: none"> ▲ 最后一次爆发于公元1800年前 ● 最后一次爆发于公元1800年后 ▲ 非常危险的火山 <p>海啸和风暴潮</p> <ul style="list-style-type: none"> ~ 海啸灾害 (地震海浪) ~ 风暴潮灾害 ~ 海啸和风暴潮灾害 	<p>热带风暴和旋风</p> <ul style="list-style-type: none"> 1级区 SS 1 (118-153 km/h) 2级区 SS 2 (154-177 km/h) 3级区 SS 3 (178-209 km/h) 4级区 SS 4 (210-249 km/h) 5级区 SS 5 (>250 km/h) <p>10年内超越概率为10%—即百年一遇的一风暴最大强度 (SS: 萨菲尔—辛普森—飓风强度表)</p> <p>热带风暴的主行进路线</p>	<p>非热带风暴 / 冬季风暴</p> <ul style="list-style-type: none"> 主要发生在冬季的强烈非热带风暴 非热带风暴的主行进路线 <p>其它自然灾害</p> <ul style="list-style-type: none"> ▲ 冰山飘浮的界限 ▲ 浮冰群 (冬季最大限度) ▲ 每年超越概率为10%—即10年一遇—高度>5米的怒涛巨浪 	<p>国界</p> <ul style="list-style-type: none"> — 国界 ~ 有争议的国界 (对政治划分不具有的效力) <p>城市</p> <ul style="list-style-type: none"> □ 居民 >1 百万 ○ 居民在 10 万到 1 百万之间 ● 居民 <10 万 ● 首都 □ 慕尼黑再保险公司代表处
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1.1 Global Major Natural Disasters

From **1950 to 1999** (Murchener Ruck Munich Re Group, 1999), all kinds of sudden natural disasters (excluding drought) have resulted in:

- **A death toll of up to 1,400,000**
- **Economic losses up to US\$ 960 billion**

☆ The Categories of major sudden disasters:

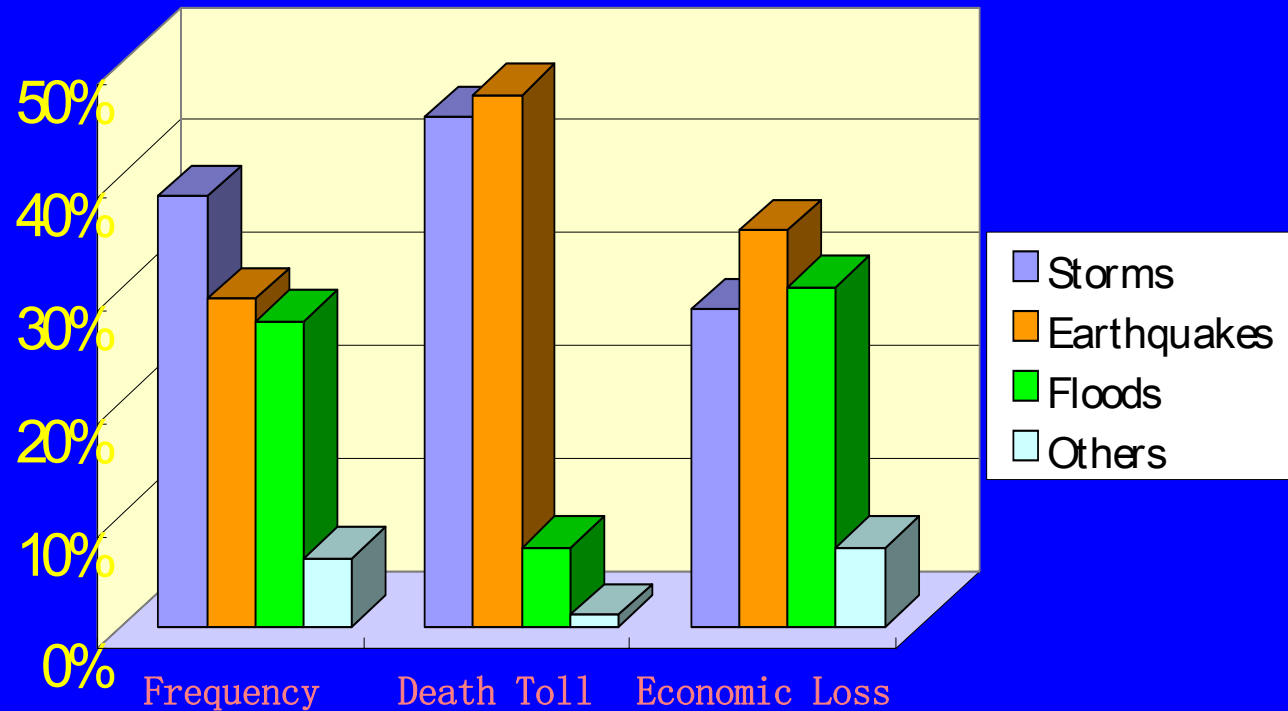
✘ Storms (including tsunamis, typhoons, storm tides, etc.)

✘ Earthquakes

✘ Floods

✘ Others

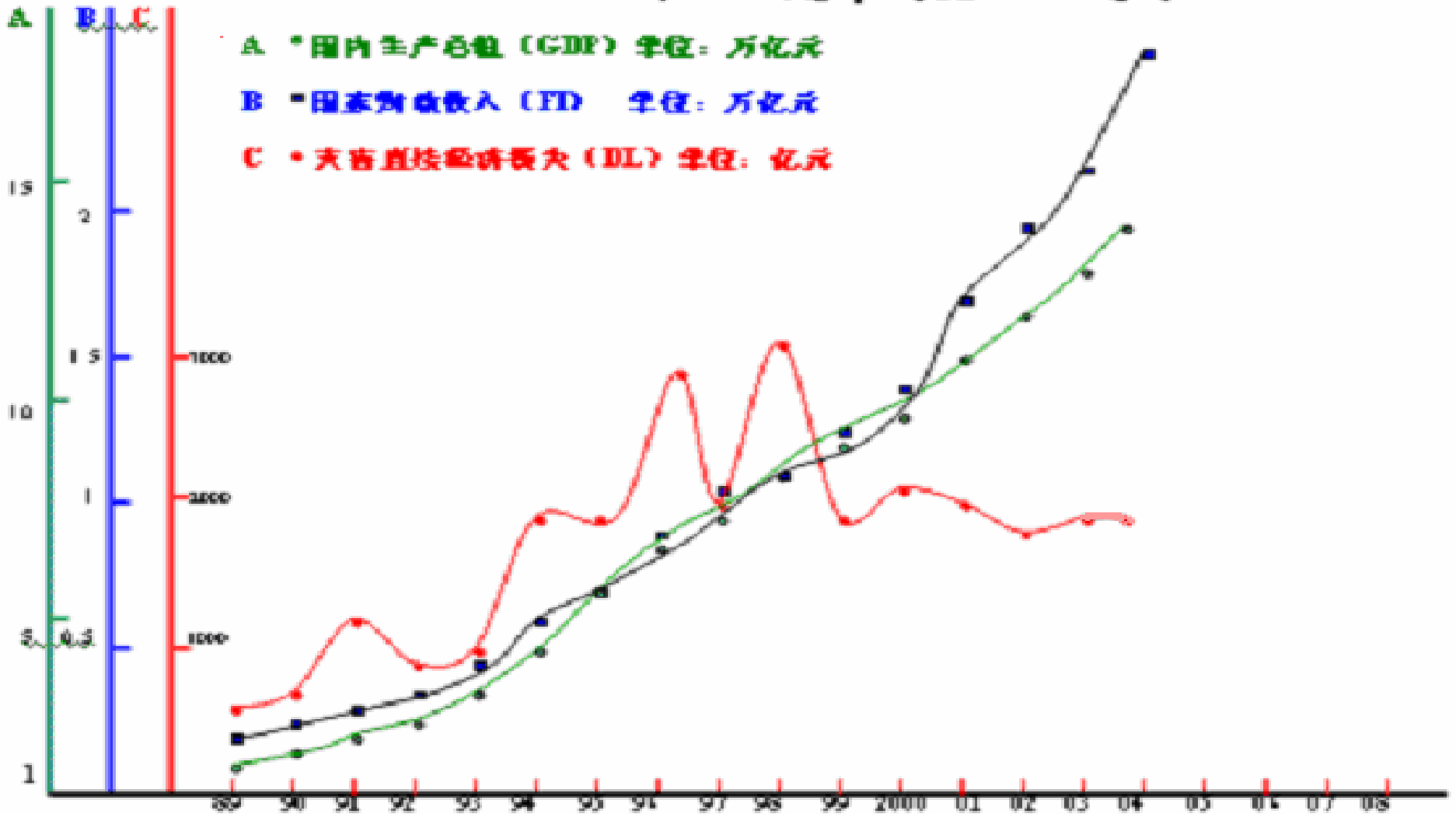
(volcanoes, geological disasters, biological disasters, fires, etc.)





1.1 Loss ratio variation in China

GDP、FI和DL随年代变化曲线图





Background

1.2 Global efforts to disaster mitigation

- ◆ Various engineering or non-engineering Countermeasures;
- ◆ Modern S&T application;
- ◆
- ◆ International activity





Global weather observation system

World Weather Information Service

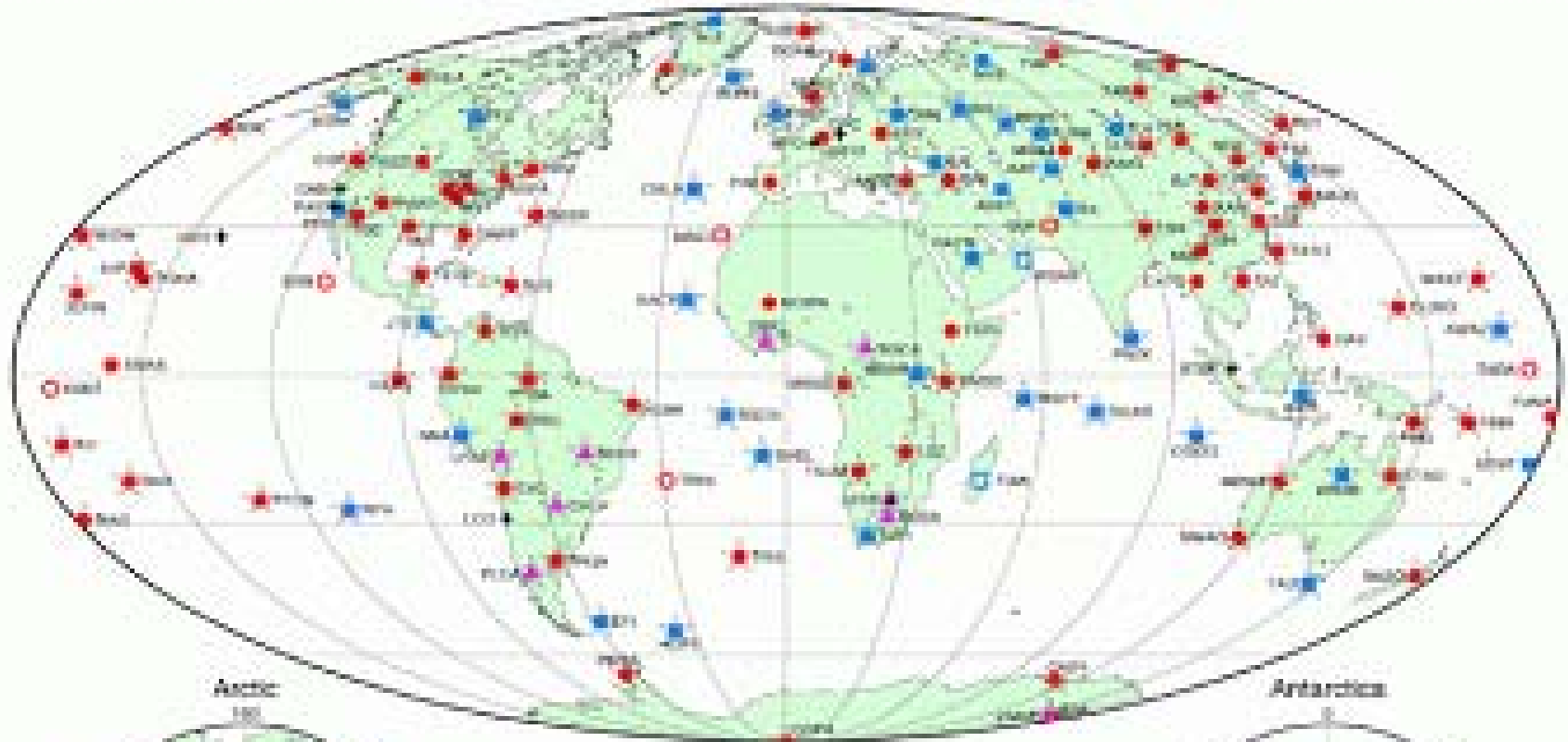
Official Observations. Official Forecasts.



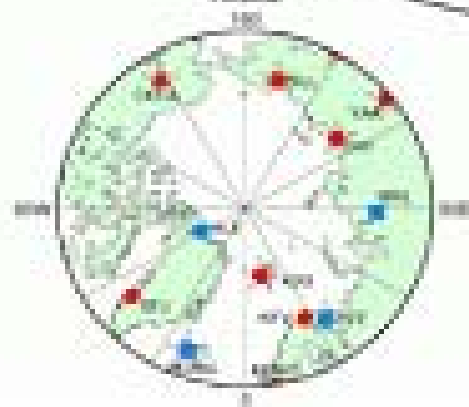


Global seismograph network

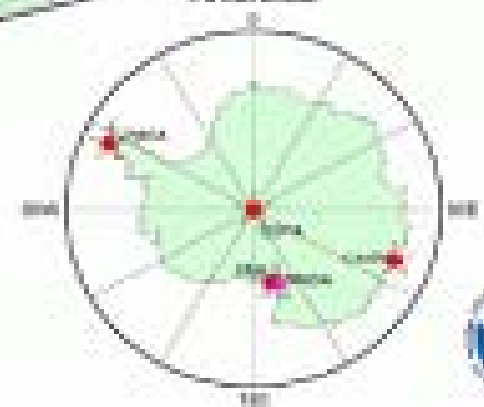
Global Seismograph Network



Arctic



Antarctica



Station Types

- ● IBS/USGS Stations
- □ IBS/IDA Stations (UCSD)
- + Other/Affiliated GSN Stations
- ■ GTSN Stations (AFTAC)
- □ Teleseismic stations

Albuquerque Seismological Laboratory
January 10, 2000 (v18)





Observatories in China

- **1. Meteorological system:**
 - 2,633 stations**
 - 957 rainfall stations**
 - 400 meteorological radar stations**
- **2. Hydrological system:**
 - 3,172 hydrological stations**
 - 15,368 rainfall stations**
 - 1,149 water level observatories**
 - 13,648 well water level observatories**
- **3. Seismic system: 1,300 earthquake stations**
- **4. Oceanic system: 104 oceanic observing stations**
- **5. Agro-system: 1,900 monitoring stations**
- **6. Forestry system: 1,898 plant disease and insect pest stations**
- **7. Forest-fire prevention system:**
 - 6,132 fire monitoring stations**



Radar network in China



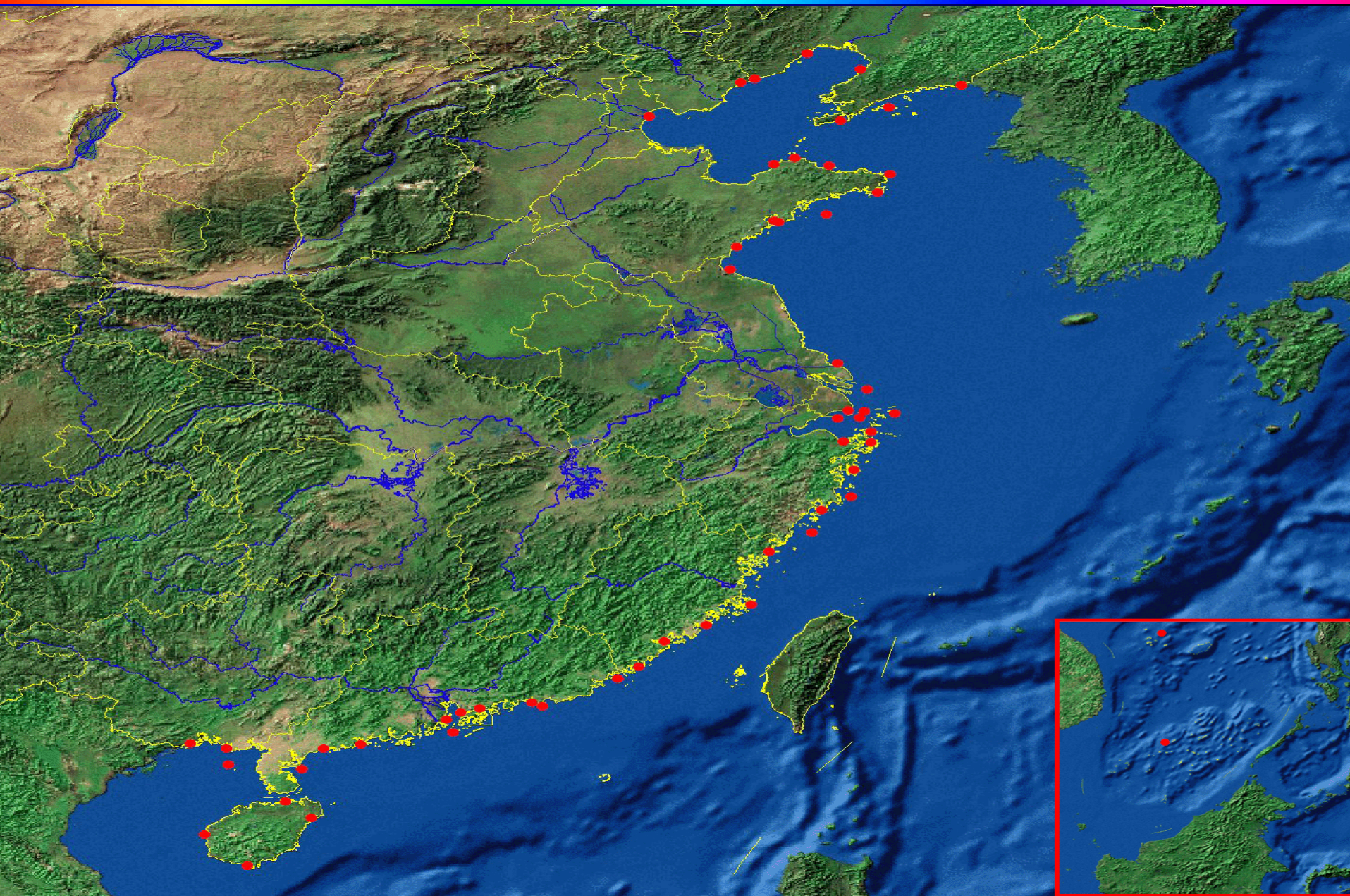


Remote sensing airplane of CAS





Tidal Gauge Stations in China



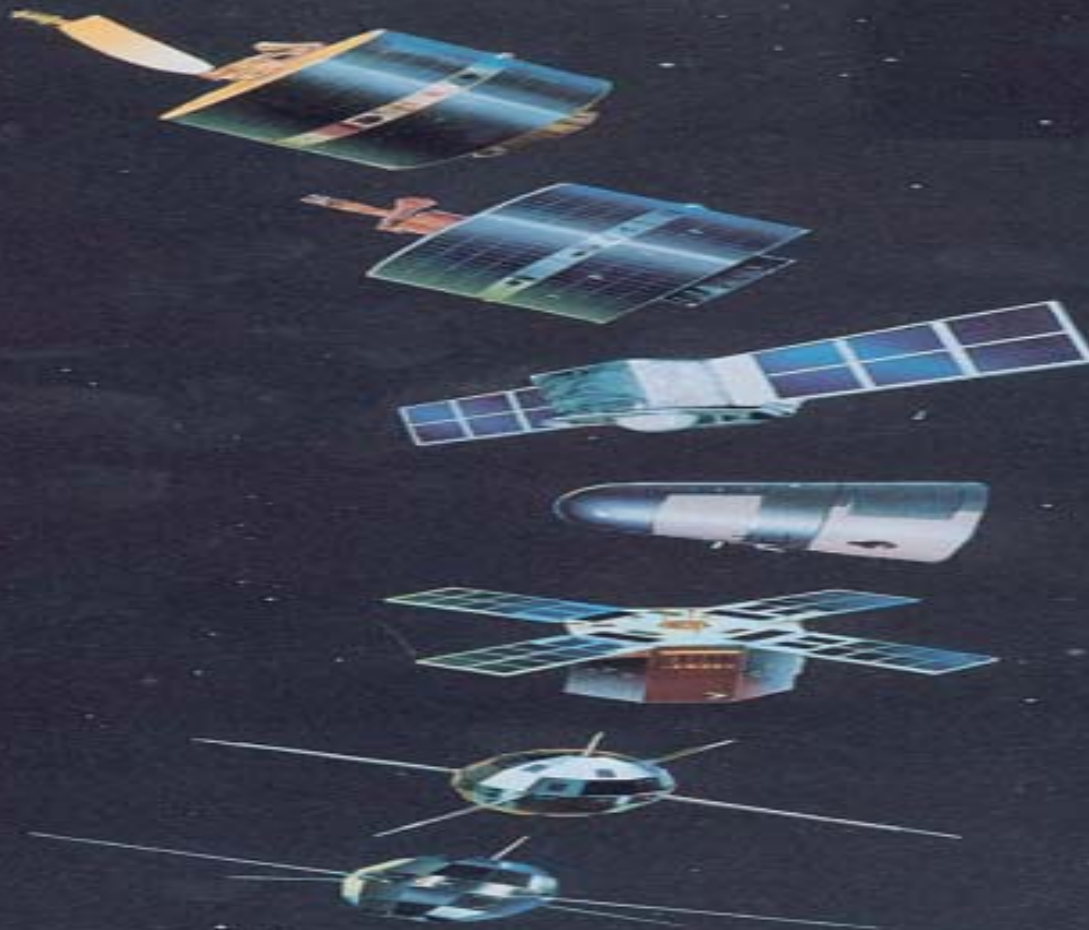


Oceanic observing & monitoring system in China





Satellite observing systems





Great progress in disaster mitigation

Since 1949, China has 3,400 billion Yuan RMB economic profit from disaster mitigation in big rivers valleys, over 10 times than the investment on it.



1998年

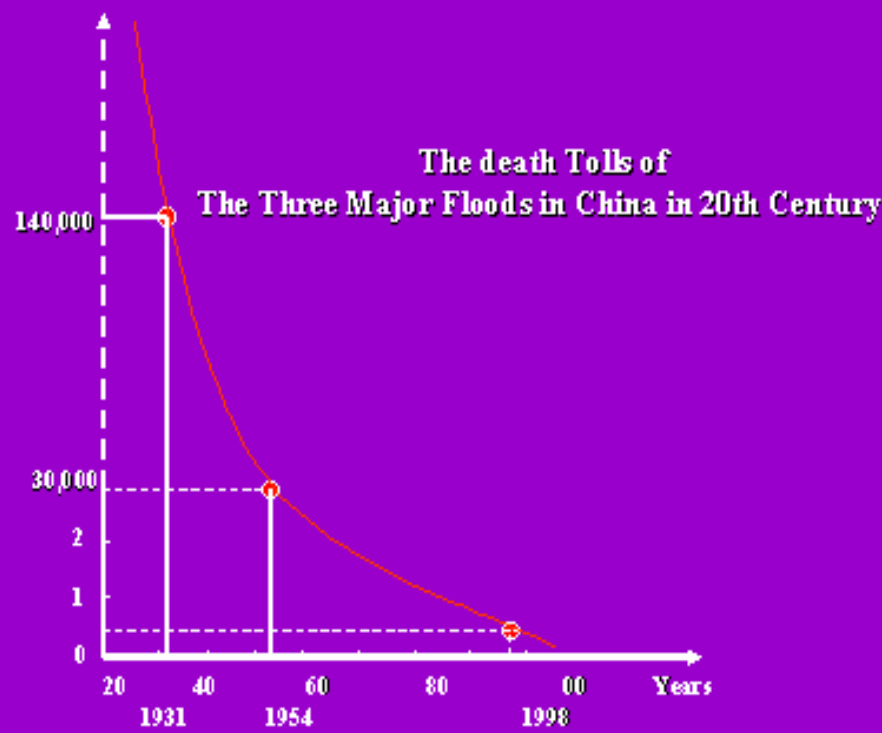
中国大洪水



1954年



1931年





1.3 SUMMARY OF OUR EFFORTS

- In 1975, I took the lead in sparkplugging “**modern disaster mitigation**” in China and has endeavored to realize it for 30 years ;
- In 1989, I strongly suggested to set up **China national center for disaster reduction**, and it was constructed and start to work in the summer of 2003;
- During 1991-1996, I led more than 200 scientists and technicians from various units over China to establish a **comprehensive S &T system for disaster reduction** for the first time in our country .
- Since 1990, strived to convince our government to set up disaster reduction **satellite system**, it did be adopted and a national project of this system was decided in Sep. 2003;
- Advocate and push forward to establish our **national modern system for disaster mitigation**.



http://www.cdrcas.com/

中国科学院减灾中心 -

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English



中国科学院减灾中心 The Center of Disaster Reduction, CAS

CDR-CAS

公告

新闻动态



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- 两岸三院信息技术研讨会在青岛召开..... [2006-09-04]
- 北京市应急重点建设项目宏大..... [2006-08-31]
- 北京发放600万“首都市民防灾应急手册”..... [2006-08-31]
- 北京市府聘任四位专家为市应急委专家顾问..... [2006-08-31]
- 热带风暴“碧利斯”造成严重灾害..... [2006-07-15]

灾害



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- 近50多年来中国的重大自然灾害..... [中国灾害]
- 中国主要自然灾害 [doc]..... [中国灾害]
- 威胁人类生存与国家存亡的巨大灾难..... [世界灾害]
- 灾害严重制约社会的可持续发展..... [世界灾害]
- 近年全球灾祸给人类的启迪..... [世界灾害]

视频下载



- 中国政府
- 气象局
- 水利部
- 民政部减灾中心



1998年10月14日，联合国减灾日，联合国在日内瓦总部万国宫举行了隆重的“联合国灾害防御奖”（1998年度）颁奖仪式。联合国秘书长安南委托联合国副秘书长德梅罗向中国国际减灾十年委员会副主任、中国民政部多吉才让部长和中国国际减灾十年委员会专家组组长、中国科学院减灾中心主任王昂生教授颁发了世界防灾减灾最高奖——联合国灾





http://www.cdrcas.com/

The Center of Disaster Reduction -

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Chinese



中国科学院减灾中心

The Center of Disaster Reduction, CAS

CDIR-CAS

Vedio Download



TV Establish of CDRCAS



CCTV The Son from Easten



CCTV Come to Science



Prof. Wang Angsheng Awarded the Highest DR Prizes in the World



Prof. Wang Ang-Sheng was born Sichuan Province of China in June 16, 1939. In 1963, he graduated from Chinese University of Science and Technology. Since 1963, he engages the Science of Disaster Prevention; Disaster Reduction; Safety, Disaster Reduction and Emergency Respond; Atmospheric Science; and Weather Modification. From 1990 to 2004, he was a Director of Experts Group of China



完毕

Internet



16:21



Awarded by CAS 1st place S&T progress



科学技术进步奖

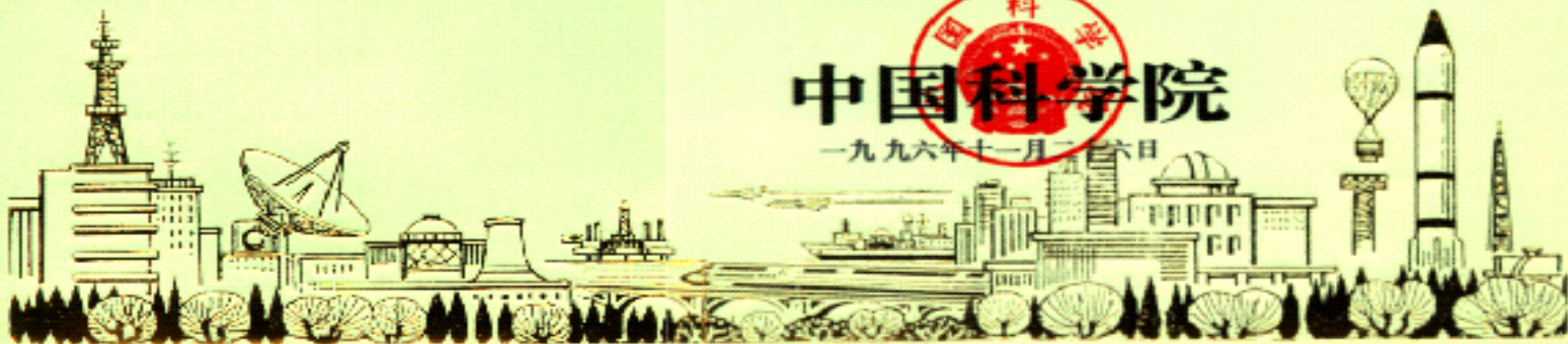
一等奖

授奖项目：台风暴雨预报警报系统及减灾对策研究

完成单位：大气物理研究所

中国科学院

一九九六年十一月二十六日





China national great achievement award

证书

国家“八五”
科技攻关重大科技成果

成果名称：台风、暴雨预报警报系统和灾害诊断
评估预测技术方法和防灾对策研究

完成单位：中国科学院大气物理研究所



一九九六年十月



Awarded by the 2nd place national S&T progress





Prof. Wang Rewarded by UN





National center for disaster reduction

Project document

中国“国际减灾十年”减灾工程 “国家减灾中心工程” 立项论证报告

建议部门：中国国际减灾十年委员会
主持编写单位：中国国际减灾十年委员会办公室
编写单位：中国科学院大气物理研究所
中国科学院地理研究所
冶金部建研院防灾抗震研究所
邮电部电信传输研究所

一九九零年二月 北京

Foundation ceremony





National center for disaster reduction

The construction site



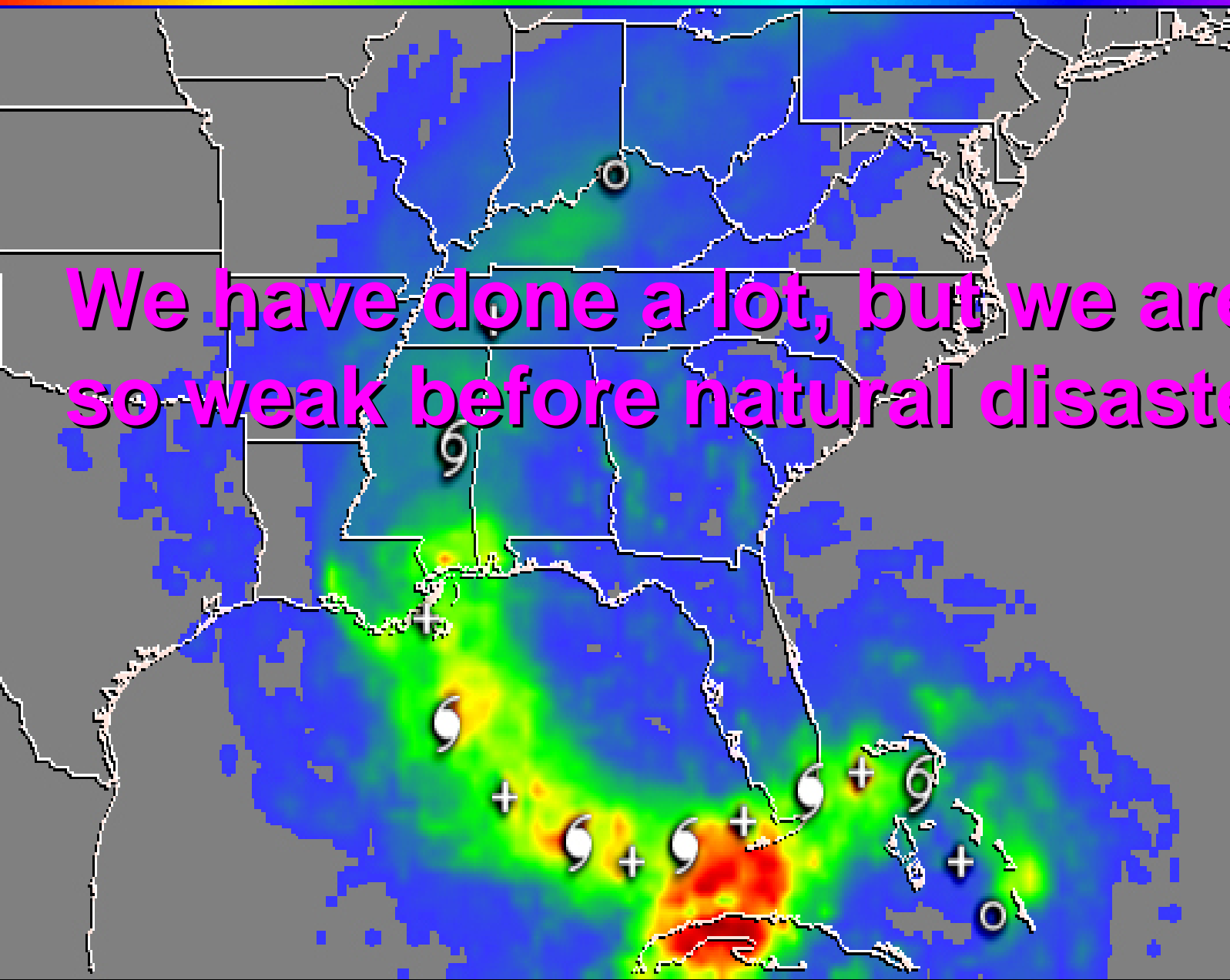
The main building





Not mighty enough

We have done a lot, but we are still so weak before natural disasters

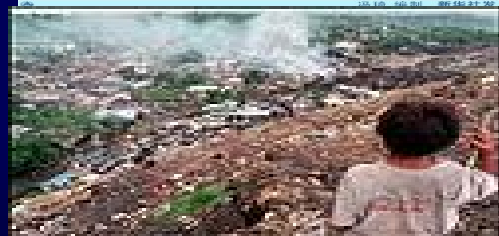
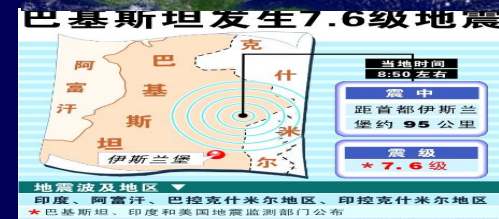
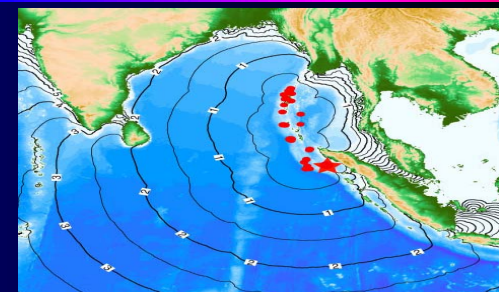




1.4 Recent Severe Scenario of Natural Disasters

Recent Serious Major Natural Disasters Continuously Threaten Human Being

- a. Great Tsunami in Indian Ocean
Killed nearly 300,000 People.
(There had **no pre-warning, no awareness, no preparedness, no response system**)
- b. Hurricane Katrina Hit USA Last Sep.
Over 1,000 people killed,
more than US\$ 100 Billion lost
(Exact prediction, but weak Preparedness)
- c. Huge earthquake in South Asian last Oct.
caused
a death toll of 76,000,
4.0 million people homeless
(No prediction, no pre-warning, no preparedness)
- d. Disastrous Landslide in the Philippines this year
buried about 1,800 people there.
(Lack of pre-warning, awareness, preparedness
emergency response system)
- e. Flood in south Asia(2,200 deaths,summer 2004)





1.4 Disaster of Hurricane Katrina

Displaced population : over 1 million

Death toll : 1417

Insurance compensation : \$US 34.4 billion

Economic loss : \$US 100 - 200 billion

Recover & reconstruction : > \$US 300 billion

Resulted in :

- (1) approximately 400,000 unemployed persons**
- (2) USA's economic growth rate drop down 0.5% in the 2nd half year of 2005**



1.4 Hurricane Katrina Disaster





1.4

Still Serious Natural Disaster Situation in China

Direct economic losses caused by disaster in 2005 in China

- yearly total loss: ¥ 2042 billion 100.0 %
- Typhoon: ¥ 800 billion 39.2 %
- Flood: ¥ 773 billion 37.9 %
- Drought: ¥ 213 billion 10.4 %
- Others: ¥ 256 billion 12.5 %

In 2005, for the first time Typhoon jumped to the most serious disaster



1.5 ICSU & IAP'S ACTION

☆ **ICSU:** define a major program on natural disaster mitigation for a decade or more,

☆ **IAP:** a initiative on disaster mitigation (2005--)

☆ **China government:**

✘ satellites for disaster mitigation;

✘ national emergency control and command center;

✘ international cooperation, aid and international training course for developed countries.



1.5 ICSU'S ACTION

ICSU:

- ☆ **The ICSU General Assembly in 2005 established an International Planning Group on Natural and Human-Induced Environmental Hazards and Disasters;**
- ☆ **begun the process of defining a major program of research aimed at strengthening international science to provide a firmer basis for policies to prevent natural hazards from becoming disasters.**
- ☆ **The international collaborative research program, lasting a decade or more, would combine the insights of the natural, health, social and engineering sciences.**



1.5 IAP Initiative

of “Global Natural Hazards and Disaster Reduction”

- **Members:**



China



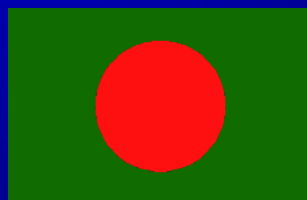
USA



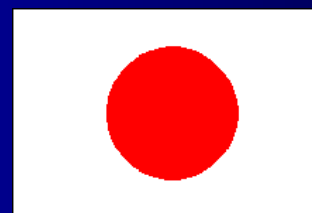
Sweden



Cuba



Bangladesh



Japan

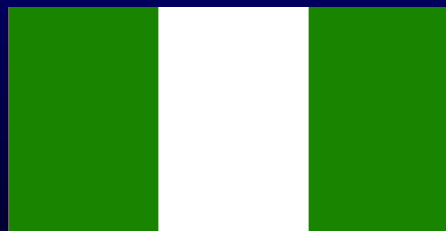


Indonesian

- **Participants:**



Thailand



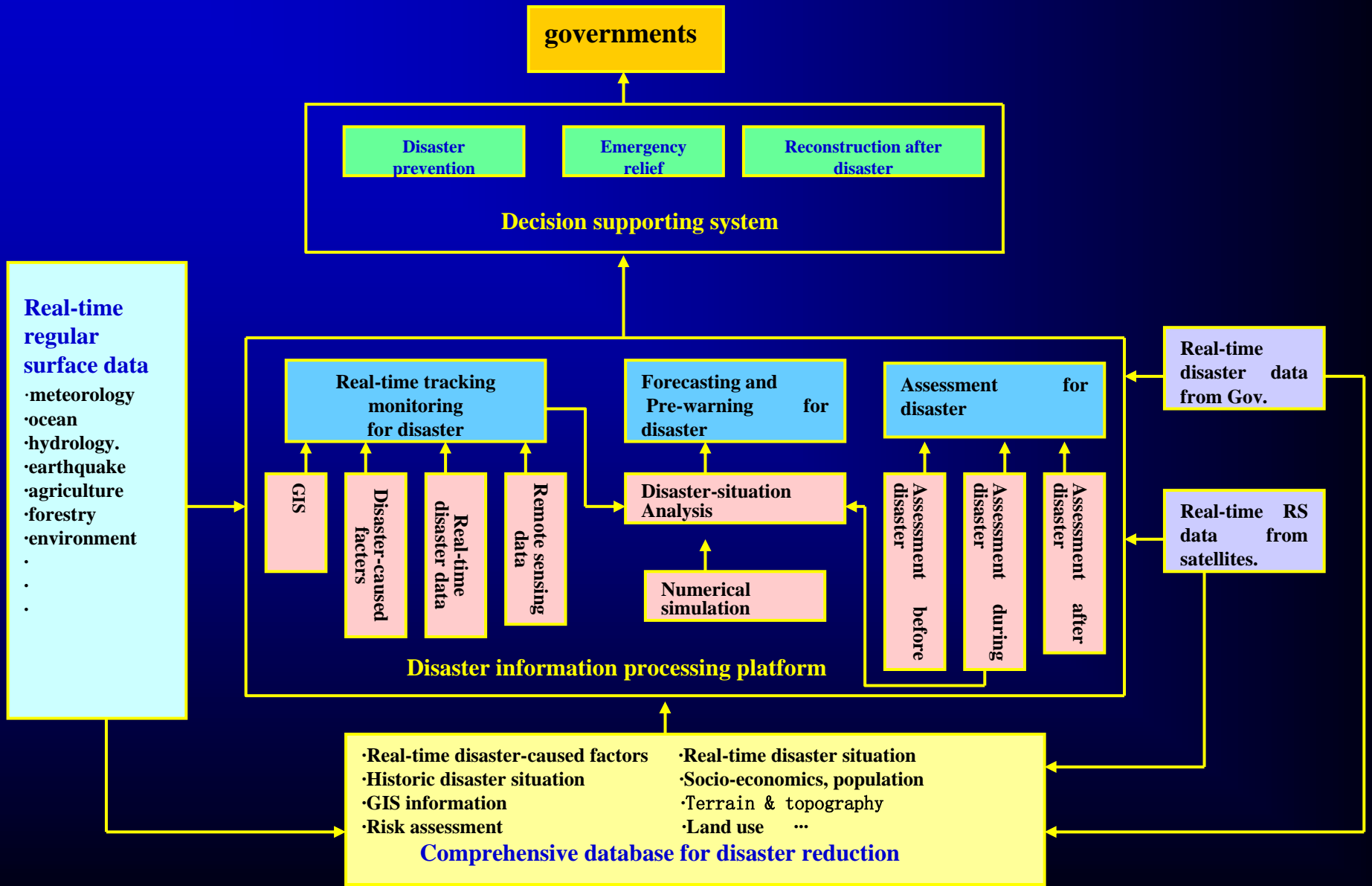
Nigeria



India



Flow chart for disaster mitigation





The primary intention of IAP Program

Set up a demonstration system for oceanic disaster mitigation

INDIA

B-DESH

THAILAND

SRILANKA

INDONESIA



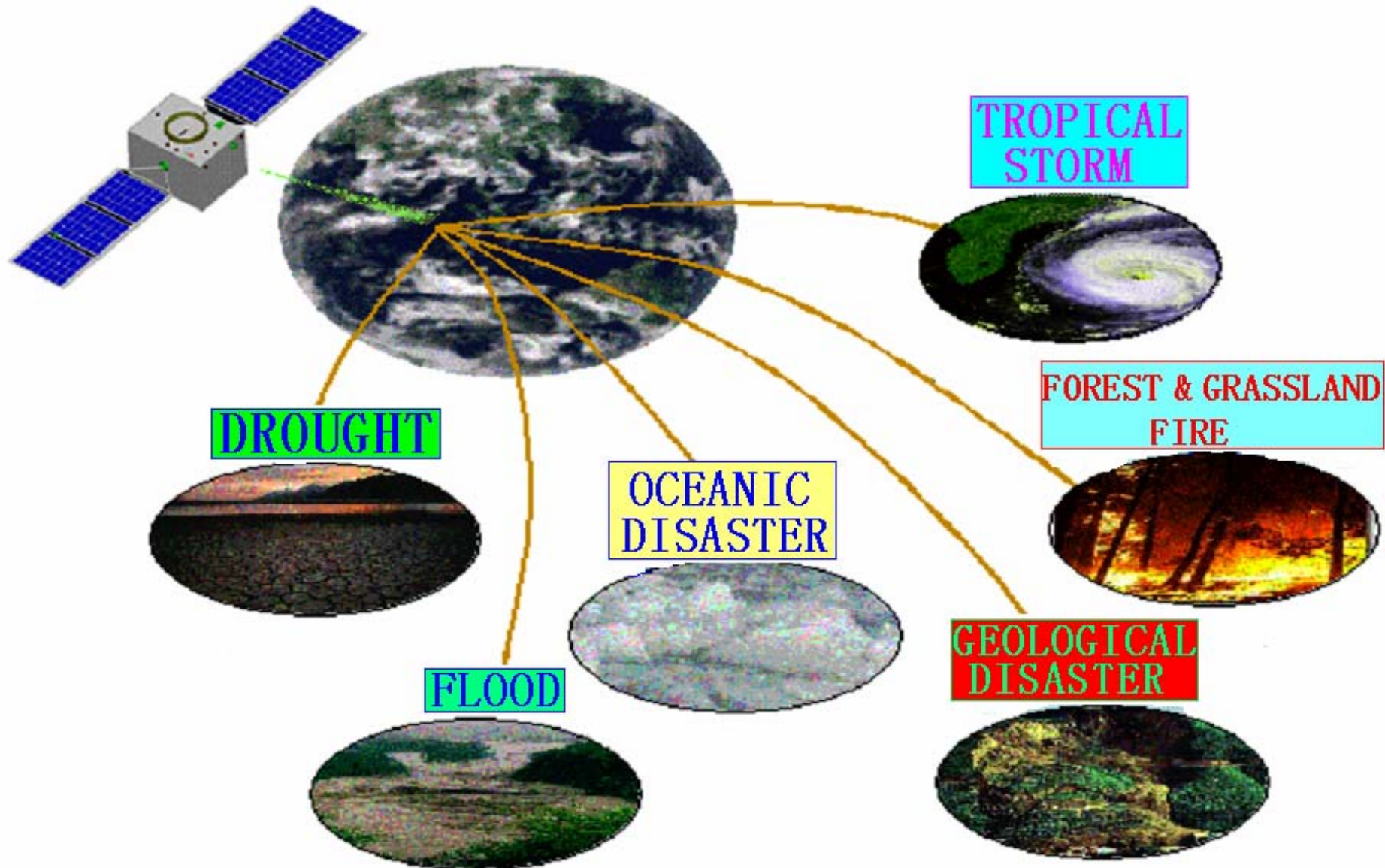
1.5 China's response

☆China government:

- ✘satellites for disaster mitigation;
- ✘national emergency control and command center;
- ✘ international cooperation, aid and international training course for developing countries.



Functions of minor satellite constellation for disaster reduction in China





Emergency communications



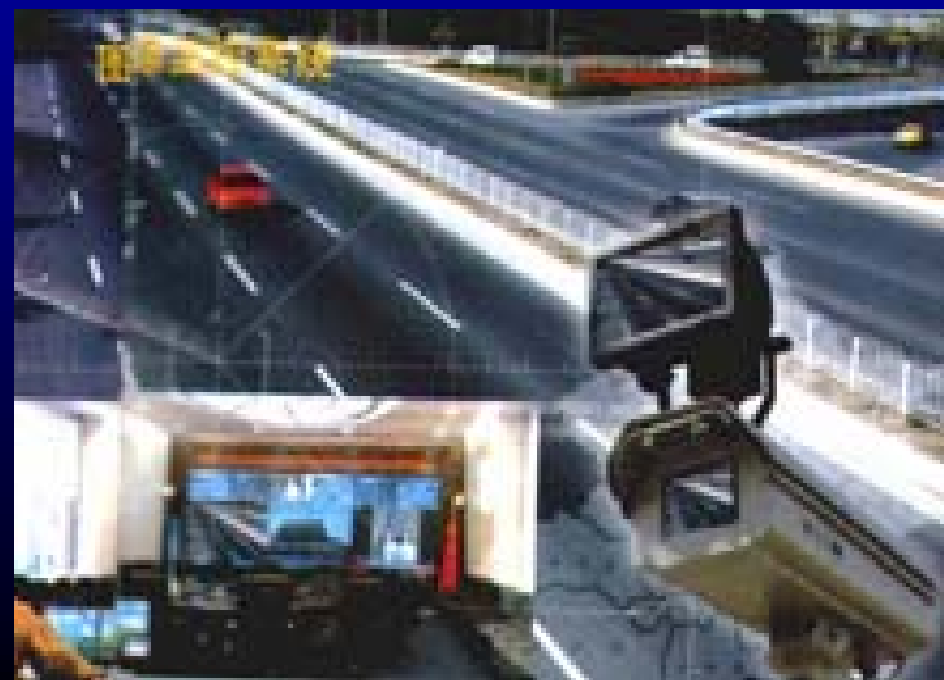
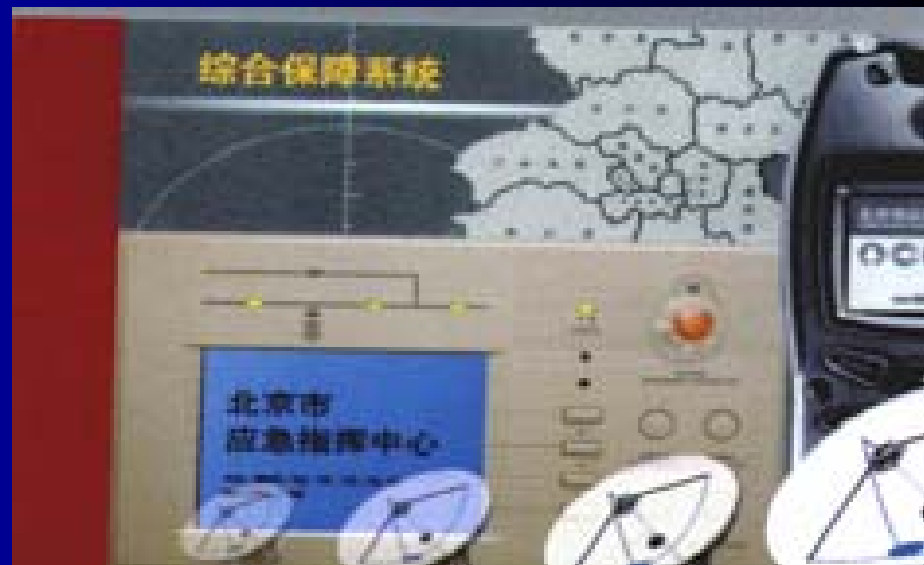
中国应急通信

China's Emergency Communications





THE EMERGENCY RESPONSE SYSTEM IN BEIJING





Objective

CISDM Task group will work on :

- **The major natural hazards and disaster mitigation,**
- **Establishment of natural disaster database (including historic database and the real-time database),**



- **■ set-up of the integrative scientific and technological model system for disaster preparedness and disaster mitigation in one or two developing counties or regions.**
- **■ encouraging and facilitating worldwide knowledge sharing and co-operating in natural disaster mitigation of scientific and technical data.**
- **■ organizing meetings on science and technology of disaster mitigation, disaster management, standardization and quality control of the disaster database.**



The main contents of the research

main researches:

- ◆ understanding of natural hazards
- ◆ monitoring and prediction
- ◆ integrated risk analysis
- ◆ Modeling,

Comprehensive information
service gateway

Uniform resource access interface
(Web service)

information
resource database

Natural Disaster
model database

Natural
Disaster information standards

Natural
Disaster
comprehensive
information system



Main tasks

- 1. The study and formulation of the standards;**
- 2. The development of information resources;**
- 3. Establishment of comprehensive information system gateway for natural disaster**



Implementation solution

1. Organization

- ✘ International expert group
- ✘ International working group
- ✘ Local working group

2. Technical route

- ✘ Formulating standards of natural disaster information
- ✘ Construction and application of the database
- ✘ technical routine of the natural disaster comprehensive information system gateway



WORKING PLAN

Stage1: the start of the project (Jan. 31, 2006 -- Dec 31, 2006)

- ① To establish preparatory **group**
- ② To submit **proposal**
- ③ To coordinate and organize the survey on natural disaster **information resources**
- ④ To initiate the investigation of relevant **standards** for natural disaster information resources data



WORKING PLAN

Stage2: Implementation (Jan. 31, 2007 -- Dec 31, 2007)

- ① To set down the **metadata and data standards** of natural disaster information resource
- ② To initiate and accomplish the formulation of uniform access **interface standards** and protocol for natural disaster information resources
- ③ To initiate and fulfill the construction of the comprehensive **information system** gateway,
- ④ To initiate the study and establishment of natural disaster model and natural disaster **model database**



WORKING PLAN

Stage3: Application (Jan. 31, 2008 -- Dec 31, 2008)

- ① To enhance the accumulation, integration and conformity of the **natural disaster data resources**
- ② To initiate and accomplish the development of **quality controlling and evaluation criterion** for natural disaster data and to scientifically evaluate, conform and modify the natural disaster database
- ③ **To modify** data model of the natural disaster development according to the feedback of application services, **to study** and develop application interface and web service based on the practical needs, such as alarming and predicting system, comprehensive **analysis system and basic scientific researches.**



5

CO-CHAIRS & GROUP MEMBERS

Co-Chairs

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5 CO-CHAIRS & GROUP MEMBERS

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National Board of Fisheries, Institute of Marine Research Station, Royal swidishi Academy of Sciences



5

CO-CHAIRS & GROUP MEMBERS

Members:

Prof. Xiao Yun (China),
Dr. Fan Xiangtao(China),
Prof. Ni Sidao(China),
Prof. Pan Chunhong(China),
Dr. Wei Fangqiang(China),
Dr. Kazutoshi Tanabe (Japan) ,
Dr. Sangho Lee (Korea),
Dr. G.L. Sipin (Philippines),
Dr. Kawang-Tsao Shao (China) ,
Prof. Suthat Fucharoen (Thailand) ,
Dr. Yin Baoshu(China) ,
Prof. Jamilur R. Choudhury
(Bangladesh) ,
Dr. Zhuji(China) ,

Dr. Dieter Rickenmann(Austria) ;
Prof. Zhong Ershun(China) ;
Dr. Rukasih Dardjat (Indonesia);
Prof. Harsh Gupta(India) ;
Prof. Masahisa Sugiura (Japan);
Dr. YungHwa Cho (Korea) ;
Dr. Z.H. Zaidi (Pakistan) ;
Dr. Fedor Kuznetsov (Russia) ;
Prof. Shang-Shyng Yang (China);
Dr. Satish R. Shetye(India) ;
Prof. Fumihiko IMAMURA(Japan) ;

Dr. Feng Qiang(China);
Dr. Li Ainong(China) ;



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(Tel: +86 10 62053193;Fax: +86 10 62053193;
E-mail:zhanglu@mail.iap.ac.cn)



Financial support

Grants and Contracts :

- ☆ US\$20,000 – from CODATA to support the effort over two years. CODATA funds will be used to supplement workshops and travel mainly for members from developing countries to attend Task Group meetings.
- ☆ Chinese Academy of Sciences may provide financial supports to organize the CISDM conference and make a data resource survey.

In kind support:

IAP(The InterAcademy Panel on International Issues) will financially support some international exports workshops on Natrual Disaster Mitigation.



Suggested Referees

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● **THANKS !**

● **谢谢 !**