Status Report on CMA V-Lab Activities

WANG Bangzhong

China Meteorological Administration Training Centre (CMATC)
WMO Regional Training Centre - Beijing
WMO/CGMS VLab Center of Excellence

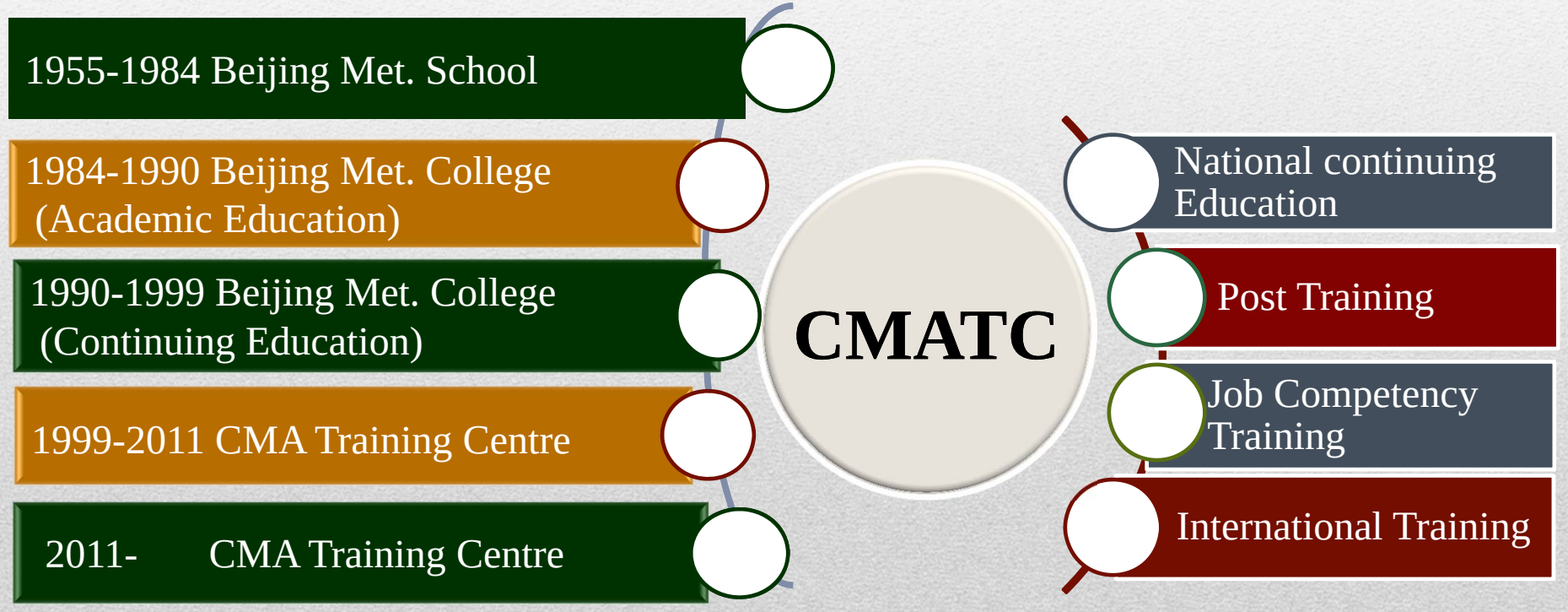
Basic Information

V-Lab Activities in China

Future Prospective

Basic information

CMATC History and Responsibilities



CMATC
WMO RTC Beijing
Centre of Excellence of WMO/CGMS V-Lab

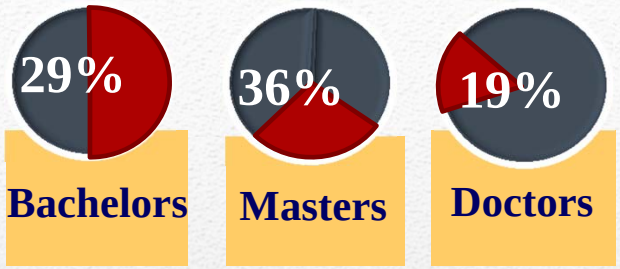
- The year 2003 witnessed the establishment of WMO RTC Beijing

CMATC
WMO RTC Beijing
Centre of Excellence of WMO/CGMS V-Lab

- In 2007 CMATC was designated as WMO/CGMS Virtual Laboratory of center of Excellence and mainly involved in meteorological continuing education in china and training for meteorologists from abroad, especially from developing countries.

CMATC: Staff

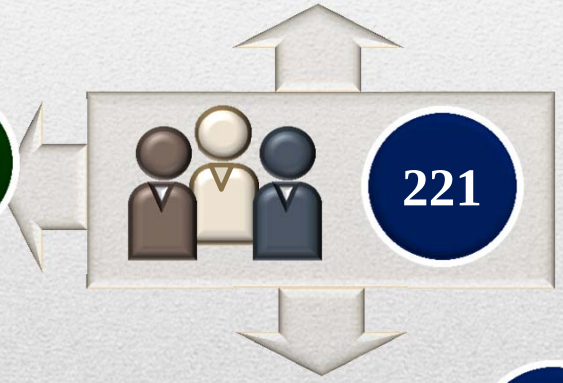
1 Academician of CAS



Professors 6%

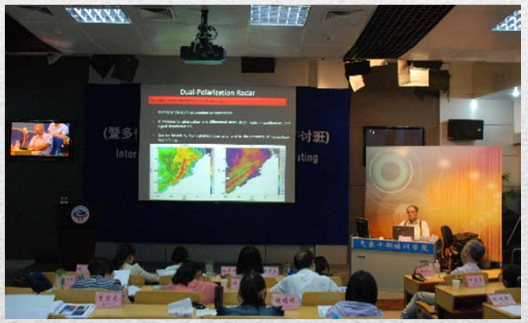
Associate Professors 40%

Lectures 30%



500

Part-time instructors:
Experts and professors
home and abroad



CMATC: Facilities

- **CMATC has 18 classrooms--1000 trainees**

CMATC : Training Areas

Met. Service

- Decision-making Met. service training
- Modern agri-met. service technique training

Weather Forecast

- Nowcasting training
- Rainstorm forecast training

DPM/DRR

- Climate and climate change training
- Climate feasibility technology training

Met. Observation

- Ground observation training
- Atmospheric sounding training

Others

- Advanced English training
- Met. standardization management seminar

OTJ academic education

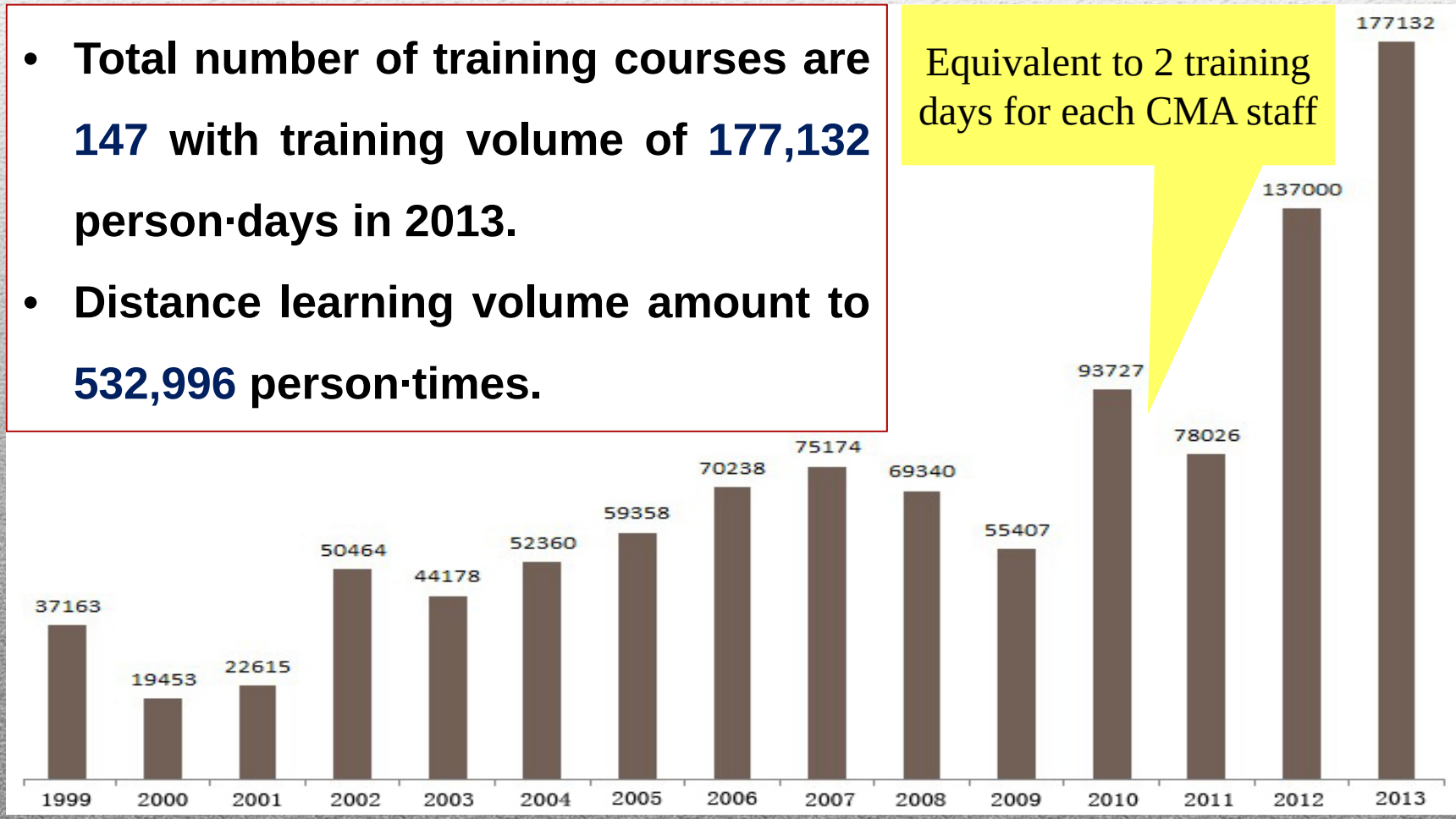
Joint postgraduate program

with Lanzhou University

CMATC: Training Volume

- **Total number of training courses are 147 with training volume of 177,132 person·days in 2013.**
- **Distance learning volume amount to 532,996 person·times.**

Equivalent to 2 training days for each CMA staff



Unit: person·days

Basic Information

V-Lab Activities in China

Future Prospective

- International Training on Meteorological Satellite
- Domestic Training on Meteorological Satellite
- Participation into VLMG
- Joining RFG Online Discussion
- Teaching Materials Construction

V-Lab Activities in China

1 International Training on Meteorological Satellite

In general, CMATC as WMO RTC has carried out many international trainings for nearly 900 participants from more than 100 countries and regions over the past decade.

In term of SMT, 109 participants from more than 50 countries and regions

The composition as follows

Indonesia(9), Malaysia(8), Mongolia(6), Thailand(6), Egypt(5), Rwanda(4), Zimbabwe(4), Yemen(3), Poland(3), Papua New Guinea(3), Saudi Arabia(3), Tajikistan(2), Kenya(2), Tanzania(2), Namibia(2), Liberia(2), Morocco(2), Vietnam(2), Oman(2), Samoa(2), Seychelles(1), Burundi(1), Azerbaijan(1), Republic of South Africa(2), Republic of Korea(2), Uzbekistan(2), Sierra Leone(1), Pakistan(1), Zambia(1), Bhutan(1), Madagascar(1), Iran(1), Senegal(1), Nigeria(1), Bahrain(1), Philippines(1), Trinidad and Tobago(1), Niger(1), Cayman Islands(1), Venezuela(1), Mexico(1), Barbados(1), Laos(1), Singapore(1), Chad(1), Kazakhstan(1), The Democratic Republic of Congo(1), Panama(1), Romania(1), Czech Republic(1), Hong Kong, China(3), Macau, China(1).

Training Events on Satellite Meteorology hosted by CMATC

NO.	Name	Participants	Duration
1	The 7th International Training Course on the Application of Meteorological Satellite Products (VCP)	13	3-13 Sep. 2013
2	Training Seminar on Application of Meteorological Satellite in Disaster Risk Reduction and Environment (VCP)	23	22 Oct. -2 Nov. 2012
3	The 5th International Training Course on the Application of Meteorological Satellite Products (VCP)	18	11-21 Jun. 2012
4	The Specific Training Course on Satellite Meteorology for BMKG's Staff	5	22-28 Sep. 2012
5	The 4th International Training Course on McIDAS-V Software Application in Satellite Meteorology(VCP)	13	7-17 Jun. 2011
6	The 3rd International Training Course on the Application of Meteorological Satellite Products (VCP)	17	22 Jun. -2 Jul. 2010
7	The 2nd International Training Course on the Application of Meteorological Satellite Products (VCP)	7	8-17 Oct. 2008
8	The 1st International Training Course on the Application of Meteorological Satellite Products (VCP)	13	28 Aug.-8 Sep. 2006
	Total	109	

COURSE CONTENTS in 2013

The Application of Meteorological Satellite Products

NO.	COURSE CONTENTS
1	General introduction to Fengyun meteorological satellites and their application
2	Infrared precipitation estimation and microwave precipitation retrieval
3	Cloud motion wind products and its application
4	Satellite atmospheric composition observation and its application on environment and climate
5	Drought monitoring using met. satellite and lab practice
6	Met. satellite and space weather
7	Wild fire monitoring by using meteorological satellite introduction and lab practice
8	Monitoring on tropical cyclones
9	Lab practice on tropical cyclones, rainstorm and strong convective weather
10	Remote sensing of snow and sea ice, volcanic eruption
11	Retrieval method of cloud parameters by remote sensing data
12	Atmospheric sounding from satellite and its application
13	Introduction to the synoptic scale cloud features

COURSE CONTENTS in 2012

The Application of Meteorological Satellite in Disaster Mitigation and Environmental Studies

NO.	COURSE CONTENTS
1	General introduction to FY meteorological satellites and their application
2	Progress on Application of Satellite Data in Numerical Weather Prediction
3	Cloud motion wind products
4	Tropical cyclone monitoring
5	Satellite channel setting and its application on disaster mitigation and environment studies
6	Use of FY-3 Satellite Data in Numerical Weather Prediction
7	Infrared Precipitation estimation and microwave precipitation retrieval
8	Urban island monitoring& Wild fire monitoring
9	Atmospheric Sounding from Satellite and Its Application
10	Thermal infrared remote sensing and its application
11	Retrieval Method of Cloud Parameters by Remote Sensing Data

COURSE CONTENTS in 2012 (Continue)

The Application of Meteorological Satellites in Disaster Mitigation and Environmental Studies

NO.	COURSE CONTENTS
12	NSMC Satellite Data Exchange and Sharing
13	Atmospheric aerosol remote sensing from satellite
14	the Application of Meteorological Satellite to Space Weather
15	Water body monitoring& Alga monitoring
16	Drought Monitoring with Meteorological Satellite
17	Study on Satellite Data Characterization of the Tropical Waves: Madden-Julian Oscillation (MJO) and Tropical Instability Waves (TIWs)
18	Remote sensing of volcanic eruption
19	The satellite image characters of heavy rainfall which is related to the upper troposphere anticyclone in south China
20	Snow cover monitoring& Sea ice monitoring
21	The application of atmospheric composition remote sensing in environmental and climate studies

COURSE CONTENTS in 2011

McIDAS-V Software Application in Satellite Meteorology

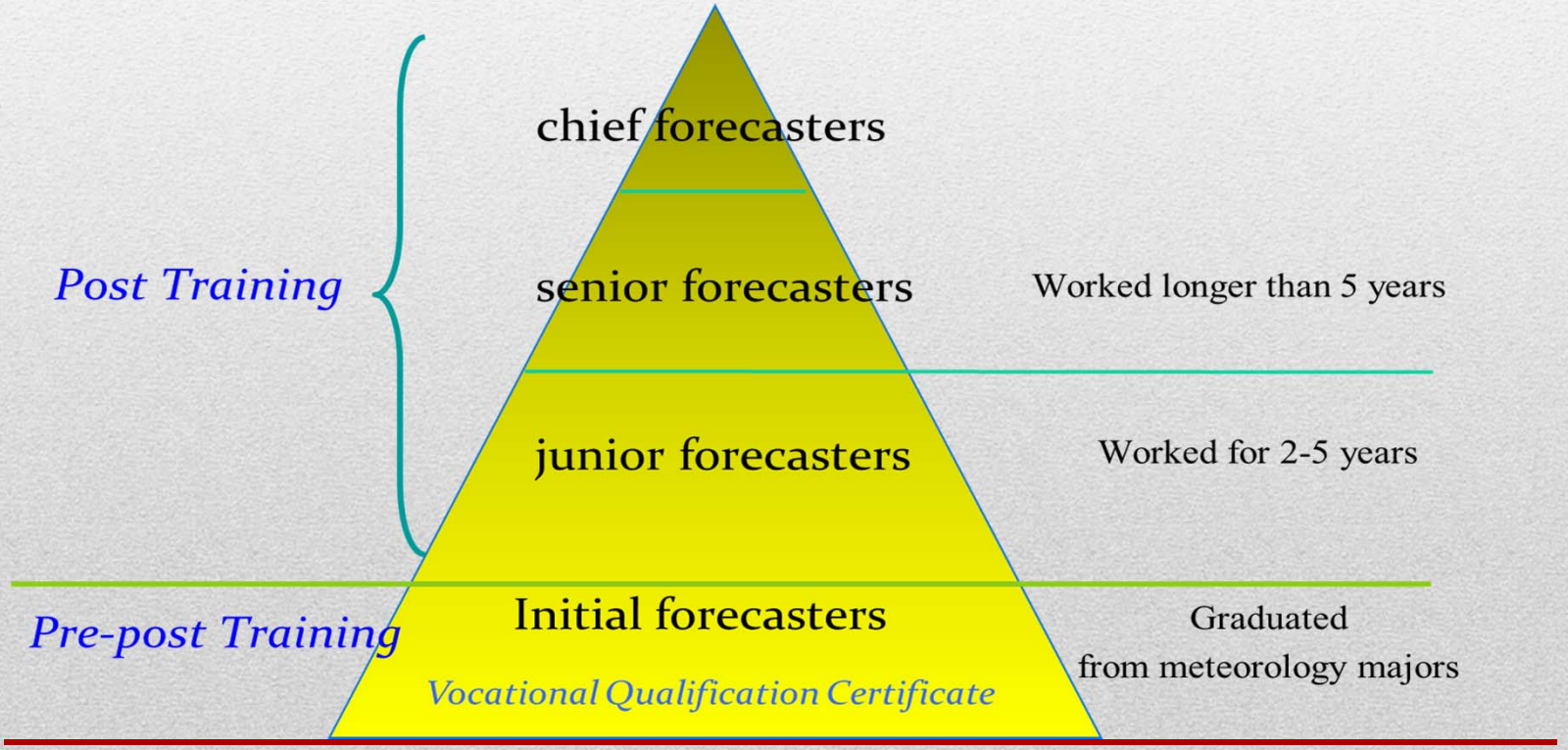
NO.	COURSE CONTENTS
1	introduction to environmental satellites, instruments and data; overview and demonstration of McIDAS software capabilities and functionality
2	in depth demonstration of working with geostationary satellite data, lab exercises with geostationary satellite data using McIDAS software
3	introduction to polar-orbiting satellite data & HYDRA, lab exercises with polar orbiting satellite data using McIDAS software and utilizing HYDRA
4	introduction to radar data, point data, and gridded data, lab exercises on radar data, point data, and gridded data using McIDAS software
5	working with 4-dimensional data display in McIDAS, lab exercises on 4-dimensional data display
6	introduction to formulas & scripting, lab exercises on formulas and scripting using McIDAS software
7	advanced lab projects for data product development and evaluation
8	demonstrations and examples on how McIDAS can assist users in more effectively use environmental satellite data
9	convection and thunderstorm nowcasting using satellite data

Opening ceremony of the 6th course on the application of Met. satellite products

Opening ceremony of the 7th course on the application of Met. satellite products

2 Domestic Training on Meteorological Satellite

- **Meteorological satellite data application is one module of forecaster training courses**



Curriculum： Rotation Training Course for junior & Senior Forecasters

No.	Subjects	Class Hour	Percentage（%）
1	NWP and the application of its products	24	10.0
2	Quasi-geostrophic theory and its application in weather analyses and forecasts	24	10.0
3	Analysis techniques for severe convective weather	48	20.0
4	**Application of Met. Satellite Images in Weather Analysis and Forecasts**	36	15.0
5	Short-time nowcasting of thunderstorm and severe convective weather	36	15.0
6	Case study and forecast summary	48	20.0
7	Lectures	24	10.0
Total		**240**	**100**

Curriculum : Rotation Training Course for Chief Forecasters

No.	Subjects	Class Hour	Percentage（%）
1	Overview of NWP and its application	20	12.5
2	Short-time nowcasting of convective precipitation system	20	12.5
3	Analysis on severe convective weathers	32	20.0
4	**Application of Met. Satellite Images in Weather Analysis and Forecasts**	16	10.0
5	Case Study of high impact weather processes	48	30.0
6	Lectures	24	15.0
Total		160	100

Curriculum : The Application of Meteorological Satellite Data in Weather Forecast

	contents	Hours	Percentage(%)
1	Analysis the features of weather systems in mid-latitude	8	16.7
2	Analysis and forecast for torrential rain	8	16.7
3	Analysis and forecast for deep moisture convection	8	16.7
4	Monitor and forecast for typhoon	4	8.3
5	Monitor the sandstorm	4	8.3
6	Application of some derived data like TVOS\ precipitation estimation	16	33

Job Skill Training

Emerging technique and method		
Training Events	Participants	Duration
Training Course on the Climate Information interactive display and analysis system (CIPAS) user	professionals	2 weeks
Training Course on Climate change and its response		2 weeks
Seminar for Interactive Processing of Satellite Data		2 weeks
Workshop for Satellite Data Assimilation Theory and Methods		2 weeks
Seminar on Specialized Meteorological Services Technique		2 weeks

Pre-post Forecaster Training for WMO Fellowship Students

3 Participation into VLMG

- **CMATC/WMO RTC Beijing was designated as one of the 13 CoEs and attended the VLMG-3 in June 2007.**

- **CMATC has been taking an active role in the V-Lab activities since 2007.**

Attending VLMG Meeting

- At **VLab-4** held in 2008 in Germany, CMATC gave the introduction about basic information, training platform, international and domestic satellite training and planning.
- In 2010, CMATC successfully held the **Vlab-5** and gave the suggestion of Chinese teaching materials sharing.
- At **VLab-6** held in 2012 in Brazil, CMATC introduced the recent training events in CMATC and discussed with other Centers of Excellence.

Hosting VLMG-5 in 2010

- **VLMG-5 opened in 12-15 July 2010 in Beijing, 23 representatives from 15 countries joined the meeting.**

Providing the Information to VLMG

The second International Training Course on McIDAS-V Software Application in Satellite Meteorology in June 2012.

The International Training course on the Application of Meteorological Satellites in Disaster Mitigation and Environmental Studies from 22 October to 2 November, 2012.

WMO OMM

Vol. 3 No. 4, August 2012

RA II Pilot Project Newsletter

DEVELOPING SUPPORT FOR NATIONAL METEOROLOGICAL AND HYDROLOGICAL SERVICES IN SATELLITE DATA, PRODUCTS AND TRAINING

Contents of this issue

Training Course on the Application of Meteorological Satellites in Disaster Mitiga-

(CMATC) in Beijing and it was co-sponsored by CMA and CMA Training Centre.

of meteorological satellites, scientific research and management. 23 international participants from 19 countries who are working in the field of satellite meteorology attended the training. 19 experts from National Satellite Meteorological Centre (NSMC) of CMA were invited to give lectures for the training course. The content of the lectures included infrared precipitation estimation and microwave precipitation retrieval; cloud motion wind products; tropical cyclone monitoring; observation operator and aerosols in satellite data assimilation; NSMC satellite data exchange and sharing; retrieval method of cloud parameters by remote sensing data; on the application of meteorological satellite to space weather; thermal infrared remote sensing and its application; use of FY-3 satellite data in Numerical Weather Prediction; satellite channel setting and its application on disaster mitigation and environment studies; drought monitoring with meteorological satellite.

In addition to the classroom lectures and discussions, the participants visited NSMC three

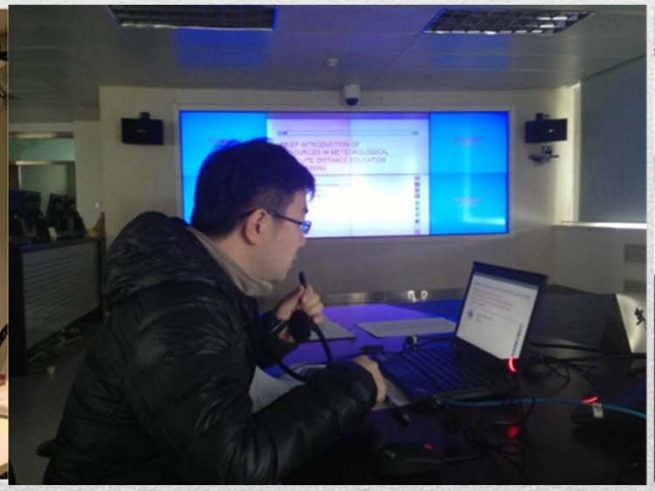
in the closing ceremony. They said that they had learnt a lot from the Chinese experts of NSMC. The development of satellite meteorology is of vital significance in the improvement of meteorological prediction accuracy and service provision. The participants were confident that what they learnt here would be quite helpful in their operational and scientific work.

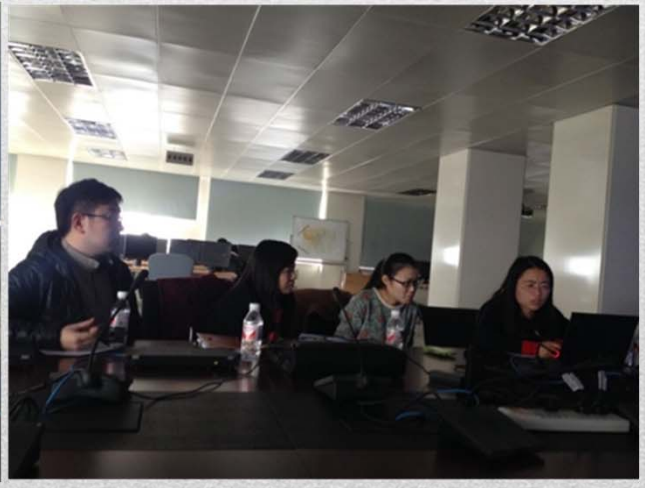
The composition of the 23 participants were from Kenya (1), Thailand (1), Malaysia (2), Bhutan (1), Poland (1), Egypt (1), Madagascar (1), Tajikistan (1), Iran (1), Indonesia (1), Senegal (1), Nigeria (1), Tanzania (1), Bahrain (1), Saudi Arabia (3), Philippines (1), Rwanda (1), Liberia (2), Morocco (1).

Sent by WANG Chunzhu - VLab CoE China - Beijing

4 Joining RFG Online Discussion

- The online discussion between CMATC and BOMTC in term of RFGs on March 12 2014
- CMATC introduced the international, domestic forecaster and distance training
- Discussing the cooperation of education and training





Joining Online Discussion

- The teachers in CMATC attended the weather discussion held on 1st April and 6th May 2014
- Review of topics future RFG meeting, cyclone Gillian and weather forecasting
- Ideas to strengthen the cooperation among the CoEs

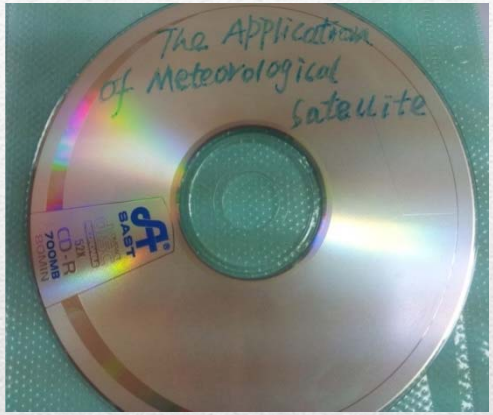
April 1st

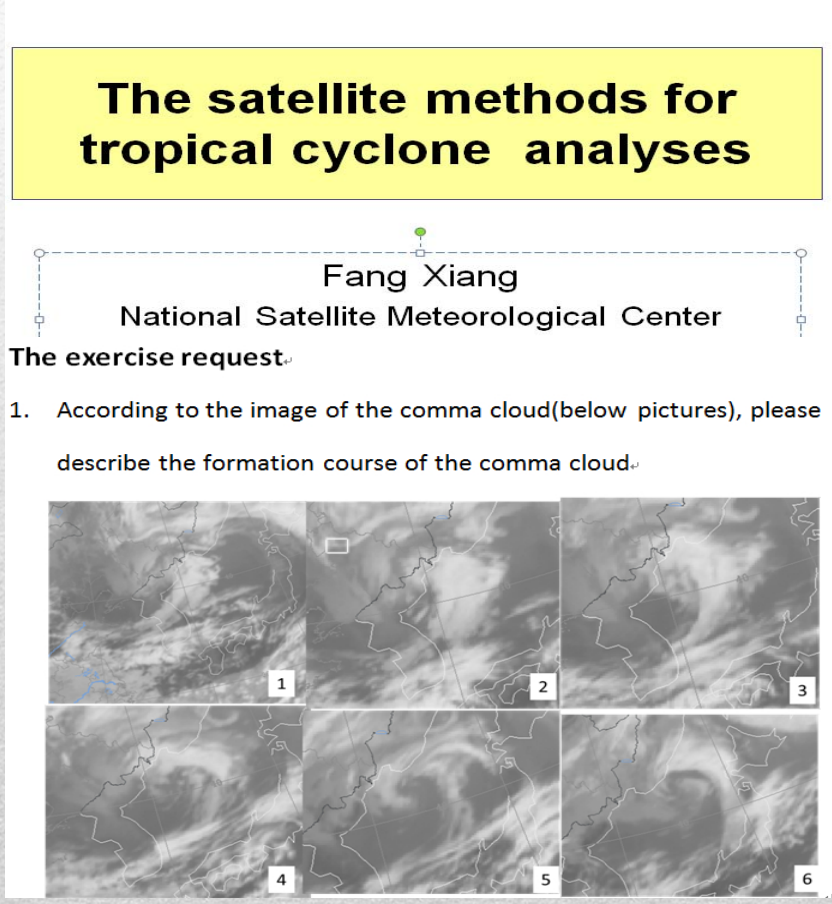

May 6th

5 Teaching Materials

Training Materials for International Training

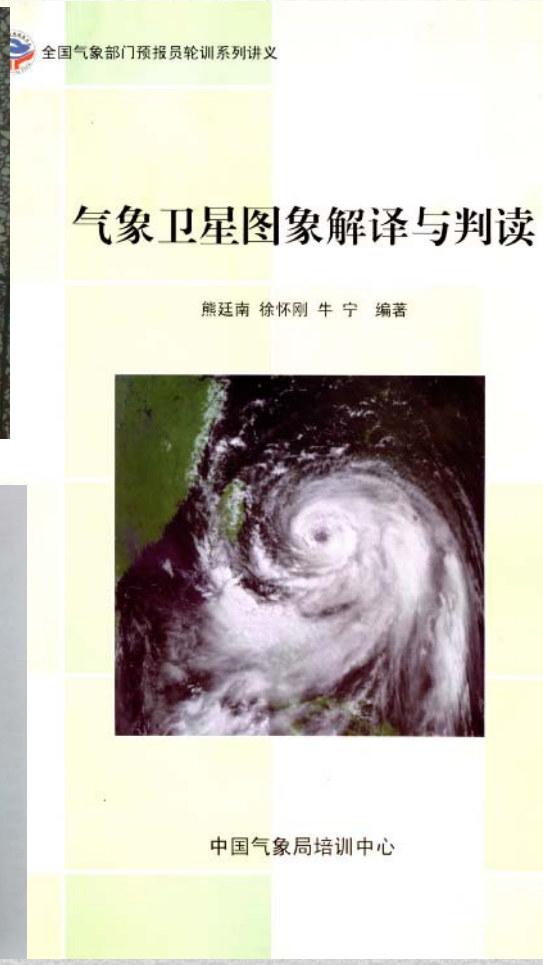
CD Courseware Video

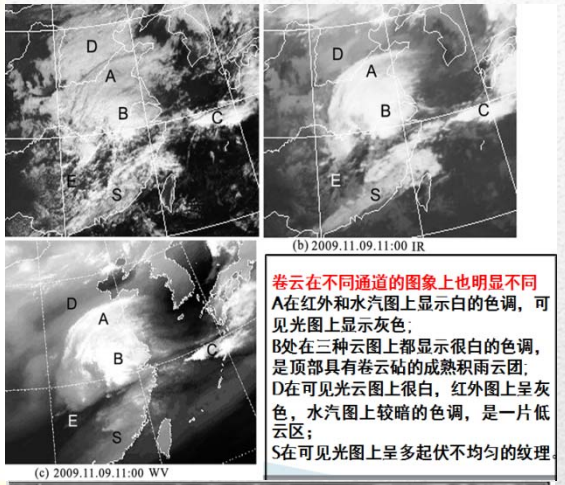


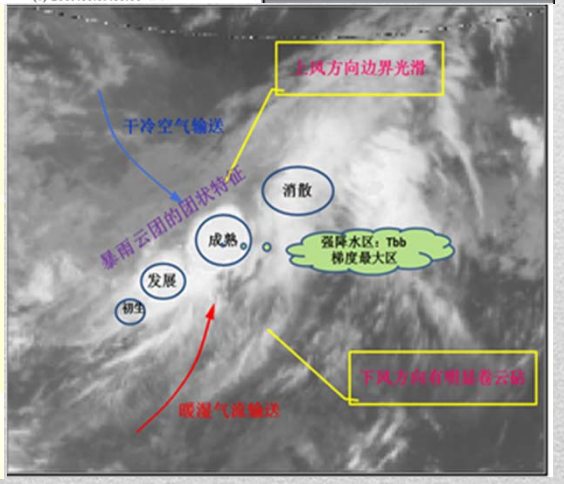


Training Materials for Domestic Training

Face to face: Books, CD, Case Database, Courseware







Training materials for domestic training

Distance Training: DVD, Books, Document

DVD

- Multimedia tutorial of meteorological satellite image analysis and application

book

- Training materials for meteorological base station (the application of satellite remote sensing)

Document

- 57 meteorological satellite documents

Courseware for Distance Training on Meteorological Satellite (in statistics)

resource name	types	hours	number of person-times	number of learners	length of learning time
➢ **Application of meteorological satellite images in weather analysis and forecasting (1-8)**	Streaming media	12	29987	11834	24901
➢ Modern Weather Service Lecture Series (**meteorological satellite part**)	Streaming media	10	11611	2227	28269
➢ **Satellite monitoring and warning technology of sand storm**	Streaming media	3	313	143	403
➢ **Comprehensive meteorological satellite data analysis and application training**	Webpage interaction	33	17834	2788	42626
➢ **Advanced analysis and application of meteorological satellite images**	Webpage interaction	20	3658	1047	4104
➢ **Basic of satellite image recognition and analysis**	Webpage interaction	20	1292	1289	1154

Courseware Types

Streaming Media

Three-Part-Separated Screen

Teaching video

Chapter hyperlink

- Reproduction of classroom teaching
- Clear knowledge structure
- Learning guided by teacher

Teaching PPT

Interactive Webpage

- Integrated rich media resources
- Strong interaction
- Independent learning

Courseware Resources Characteristics

Integrated Resources

Basic knowledge

- 7 chapters
- Streaming media

Lectures of application

- 22 chapters, 50 video clips, 15 typical cases
- Streaming media

Case practice

- 4 comprehensive cases analysis

Self test

- 5 sets of online examinations, 105 multiple-choice questions

Example: Comprehensive meteorological satellite data analysis and application training

Basic Information

V-lab Activities in China

Future Prospective

FUTURE PROSPECT

- **CMA two basic documents: Development plan and Modernization plan**
- **By 2020 CMATC will have become a better national education & training body in china and will play an important role globally, superior in facilities, specific in disciplines, abundant in instructors, standard in management and effective in training event to meet the development needs of meteorological services**
- **During this process more efforts will focus the satellite meteorology data and products applications.**

Action for CMATC Modernization in term of SMT

Future Activities

- **Faculty building:** Training platform, Teaching team and Curriculum construction
- **International training:** Carrying out training courses about the application of FY data and Developing the international distance training
- **Information sharing:** Translating teaching material

RFG discussion: Holding the online discussions with other CoEs

Thanks for your attention!

2 Introduction to CMATC

Organizational Structure

5 administrative divisions

- Office of General Affairs (Planning& Finance division)
- Human Resources Division
- Training Management Division (Division of Science and Technology)
- Office of CPC Committee
- Office of Retired Personnel

6 operational departments

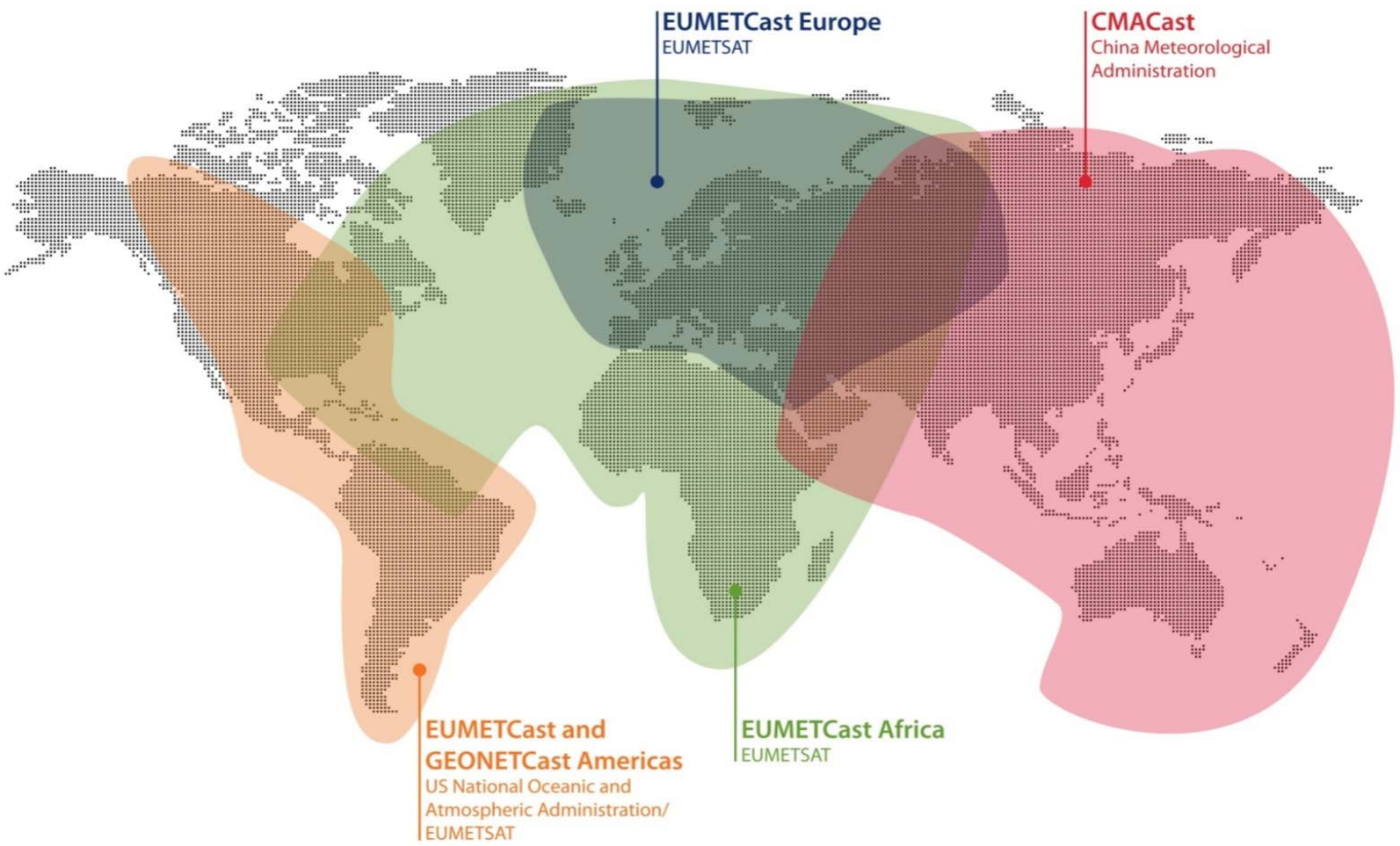
- Department of Meteorological Training (Weather Forecasting Laboratory_
- Department of Management Training
- Distance Education Centre
- Department of Training Development (Department of International Training)
- Dept. of Standardization and S&T Assessment
- CMA Library

4 affiliated units

- Unit of Policy Study & Information Service
- Unit of Development Study & Planning
- International Cooperation Service Centre
- Human Resource Exchange Centre

CMATC

CMACAST -- A CORE SYSTEM OF GEONETCAST



METEOROLOGICAL SATELLITES

Current status:

- Polar orbiting FY-1D FY-3A, 3B in orbit
- Geostationary FY-2C/2D/2E/2F in orbit