



国际气候与环境科学中心
International Center for Climate and Environment Sciences



Reports of COMSATS International Thematic Research Group on “Climate Change and Environmental Protection”

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I. Broad Objectives of COMSATS ITRG

- **To achieve South-South cooperation by creating linkages among the organizations working in the “climate and environmental sciences” in the developing countries:**
 - **Joint Research Projects**
 - **Experts Exchange**
 - **Knowledge Sharing**
 - **Capacity Building**
 - Short-term (Training Course, Visiting Scientist Program)
 - Long-term (Post graduate Studies; PhD and Master Programs)
 - **Sharing of Facilities and Resources**



II. Activities of COMSATS ITRG

1. Progress Meeting of ITRG

2. New International Collaboration Established

- New Members
- China-Thailand Cooperative Research Project

3. Research Progress

- Data Collection
- Preliminary Results

4. Capacity Building Activities

- 2013 ICCES International Training Workshop on “Extreme Weather and Climate Event”
- short-term visiting



2nd Progress Meetings of COMSATS ITRG



- ◆ The 2nd meeting of COMSATS ITRG on “Climate Change and Environmental Protection” was held on July 21, 2013, Beijing.
- ◆ More than 30 scientists from 12 countries attended this meeting.
- ◆ In this meeting
 1. The focal points from different countries were identified
 2. Commitments by each member to conduct were further confirmed
 3. The action plan and timeline for the research assignments for the year 2013 were finalized



Action Plan of the 2nd Progress Meetings

For Group Leader:

Timeline	Activities and Responsibilities
July 2013- April 2014	<ul style="list-style-type: none">● Providing continuous guidance to the Group Members regarding the execution of their research assignments● Fulfilling training needs of Group Member● Seeking updates on the status of implementation of research segments assigned● Compilation of reports submitted by Group Members● Presentation of the progress made by the Group during 17th Coordinating Council Meeting (April/May 2014, Iran)

Action Plan of the 2nd Progress Meetings

For Group Members:

Timeline	Activities and Responsibilities
July 2013- April 2014	<ul style="list-style-type: none">● Active correspondence with the Group Leader● Making concerted efforts for executing research segments assigned during 2nd meeting of ITRG in laboratories of home institutions● Sharing of meteorological data with Group Leader● Seeking guidance from the Group Leader in case of encountering any issues in analyzing data or conducting research.● Informing the Group Leader regarding training needs (if any)● Providing periodic reports to the Group Leader regarding the status of implementation of the project

3rd Progress Meetings of COMSATS ITRG



- ◆ The 3rd meeting of COMSATS ITRG on “Climate Change and Environmental Protection” was held on January 22, 2014, Islamabad.
- ◆ In this meeting, the participants
 1. The progresses have been made since the 2nd progress meeting in Beijing were reported
 2. The challenges being faced by each member were identified
 3. The action plan and timeline for the research assignments for the year 2014 were finalized



Group Members' Action Plan of the 3rd Progress Meetings

Timeline	Activities and Responsibilities
Feb-March 2014	Meteorological data Collection , Preparing research proposal
April-May 2014	Preliminary analysis of extreme events in respective home institutions, under the supervision of the Group Leader
Mid of June 2014	Submission of 1 st Progress Report to the Group Leader regarding the status of implementation of the project
July-Sep 2014	Execution of different segments of the joint research project as agreed with the Group Leader <ul style="list-style-type: none">● Selecting eligible active group members for the CTWF workshop● Present research findings in CTWF 2014
End of Sep 2014	Submission of 2 nd Progress Reports to the Group Leader
Oct-Dec 2014	<ul style="list-style-type: none">• Execution of different segments of the joint research project• Manuscript preparation of Joint Papers
End of Dec 2014	Submission of Annual Progress Reports to the Group Leader

Group Leader's Action Plan of the 3rd Progress Meetings

Timeline	Activities and Responsibilities
Jan-March 2014	Collection of meteorological data from Group Members
April-June 2014	Providing guidance to Group Members for preliminary analysis
Mid of June 2014	Collection of 1 st Progress Report from the Group Members
July-Sep 2014	<ul style="list-style-type: none">• Providing guidance to the Group Members regarding the execution of different segments of joint research project• Sideline meeting for the ITRG with focus on extreme events
End of Sep 2014	Collection of 2 nd Progress Report from the Group Members
Oct-Dec 2014	<ul style="list-style-type: none">• Providing guidance for the execution of segments of joint research project• Publication of Joint Papers in collaboration with Group Members
End of Dec 2014	Collection of 3 rd Progress Report from the Group Members
Jan-March 2015	Compilation of Progress Reports submitted by Group Members
April/May 2015	Presentation of the progress made by the ITRG during 18 th Coordinating Council Meeting (April/May 2015)

New International Collaboration Established



- Group Members
- China-Thailand Cooperative Research Project on “Study and Develop Seasonal Weather Forecast in Thailand Using IAP-DCP Model”



Group Members



Current Member Countries:

➤ China, Pakistan, Thailand, Sri Lanka, Mongolia,
Iran, Nigeria, Nepal, Malaysia, Ethiopia, Uganda

New Members:

➤ Bangladesh
➤ **Sudan**

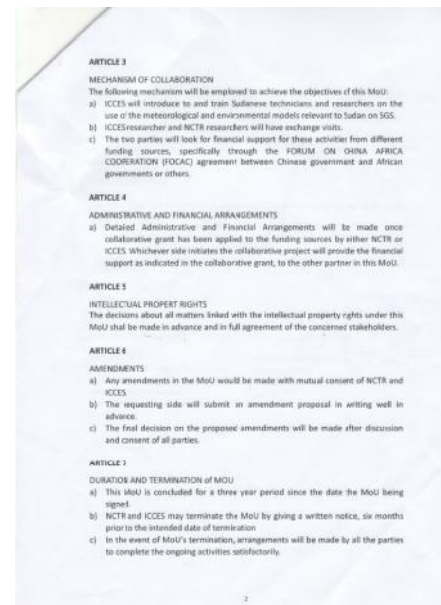
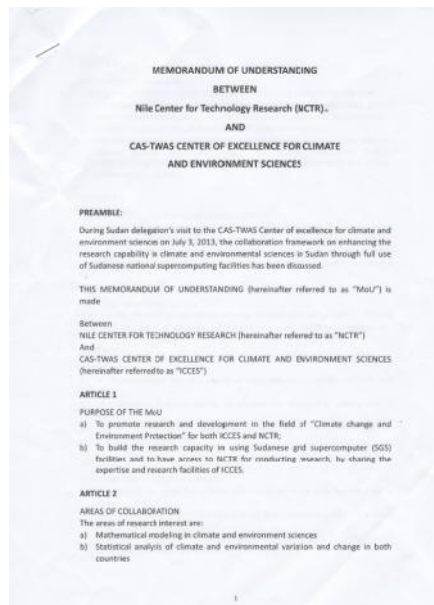


New Members



◆MOU with Nile Center for Technology Research, Sudan

1. conduct collaborative researches on climate sciences
2. share the observed data
3. ICCES will provide necessary scientific and technology support for Sudan institutes





New International Collaboration

Theme:

Development of Seasonal Climate Forecast System in Thailand Using IAP-DCP Model

Sponsor & Partner:

สำนักงานกองทุนสนับสนุนการวิจัย (สกว.)
The Thailand Research Fund (TRF)

Thailand Research Fund (TRF)



Kings Mongkut's University of Technology Thonburi (KUMTT)



Joint Graduate School of Energy and Environment (JGSEE)

Next Move:

ICCES researchers will visit KMUTT in June, installing the IAP 9L AGCM in KMUTT's computing system, introducing the statistical prediction system which has been used in IAP and training on Dynamical Climate Prediction of Institute of Atmospheric Physics (IAP-DCP) seasonal prediction system.





Two-year Project Timeline

Activities	Times
1. Kick off meeting at ICCES	12 -19 Oct 2013
2. ICCES 1 st visit to KMUTT, Model configuration	Nov - Dec 2013
3. The first six-month report to TRF	15 Mar 2014
4. Model simulation and experiment	Mar - Sep 2014
5. The second six-month report to TRF	15 Sep 2014
6. ICCES 2 nd visit to KMUTT, Result discussion	Sep - Dec 2014
7. Forecast seasonal weather in Thailand	Sep 2014 – Mar 2015
8. The Third six-month report to TRF	15 Mar 2015
9. Result discussion and report preparation	15 Sep 2015

Research Progress



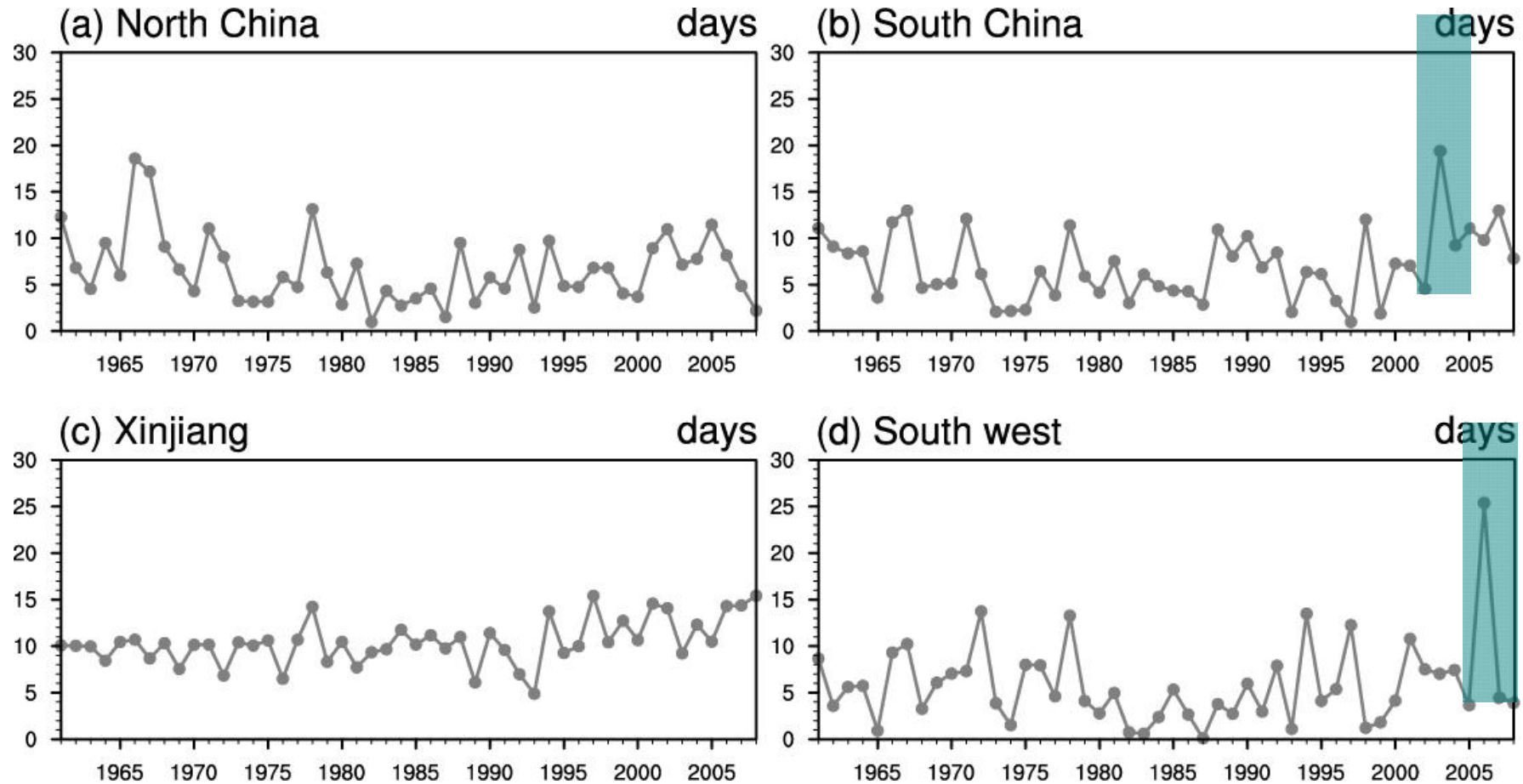
Based on the action plan discussed and agreed upon by ITRG members, so far, the datasets collected and preliminary results by members and shared with group leader are as follows:

- **Prof. Zhaohui Lin, China**: Gridded temperature data with 0.5 degree resolution during 1961-2008, and observed daily precipitation data from 730 meteorological stations during 1961-2010;
- **Ms. Doljinsuren Myagmar, Mongolia**: Monthly mean temperature and precipitation data from 6 meteorological station during 1981-2010;
- **Dr. Rijan BhaktaKayastha, Nepal**: Observed data related to daily rainfall in June 2013 from 17 selected meteorological stations;
- **Mr. Victor Dike, Nigeria**: Daily precipitation data during 1981-2010 from 6 meteorological stations;
- **Mr. Keerthi Fonseka, Sri Lanka**: Daily precipitation and daily maximum as well as minimum temperature data during 2003-2013 from 5 meteorological stations;
- **Dr. Kanoksri, Thailand**: Daily rainfall and temperature data during 1961-2010 from 48 meteorological stations;
- **Mr. Kituusa Mohammad, Uganda**: Observed data related to monthly mean maximum and minimum temperature during 1990-2009 from 5 meteorological stations in Uganda;

There are also several ITRG members, who already collect the datasets needed, but only share the preliminary results with group leaders

China

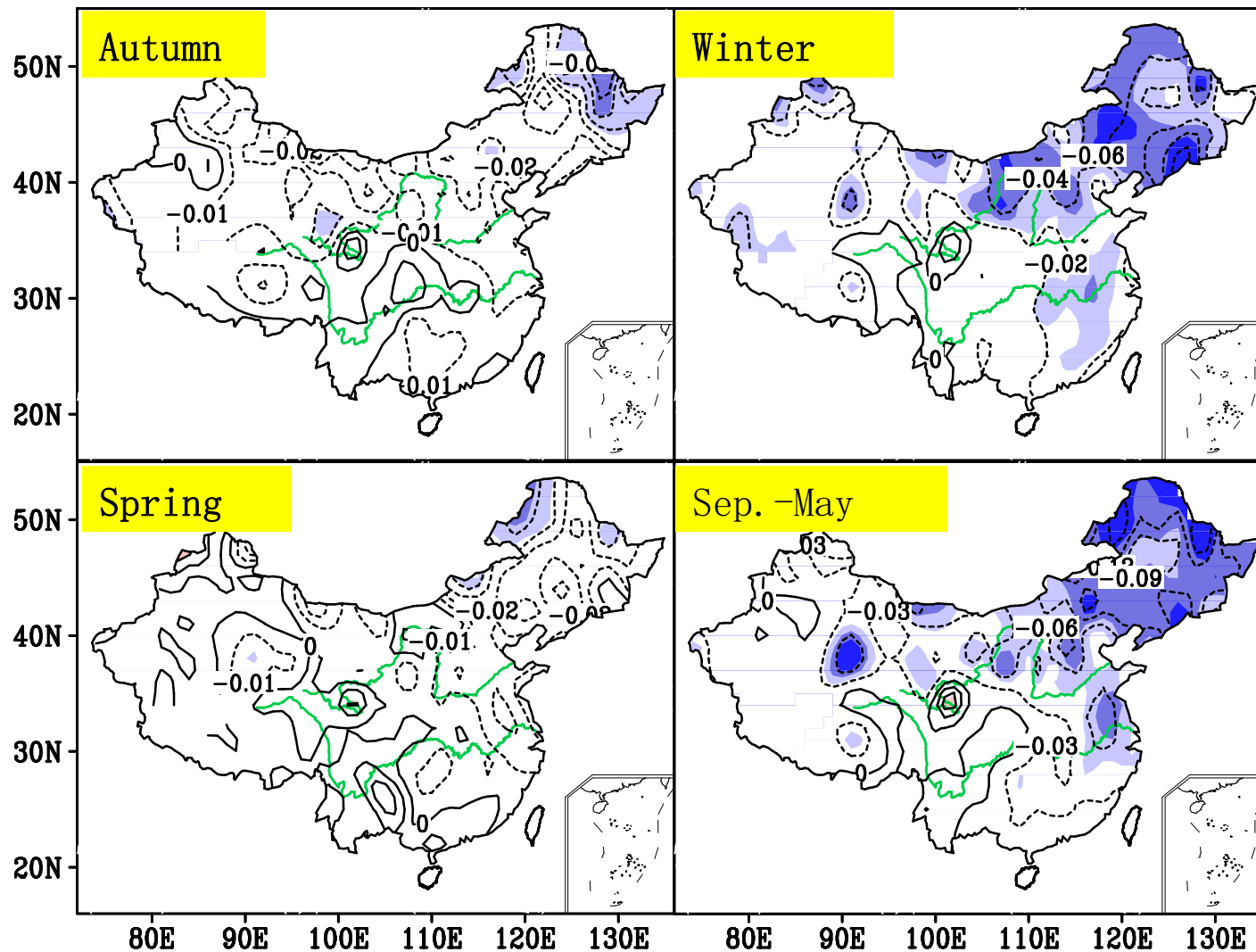
Variations of hot days



Variations of HDs during 1961-2008 in North China, South China, Xinjiang and South west.

China

Linear trend of cold waves Occurrence Frequency of in Northern China during 1951–2006



NIMET Data- Daily Rainfall Dataset:

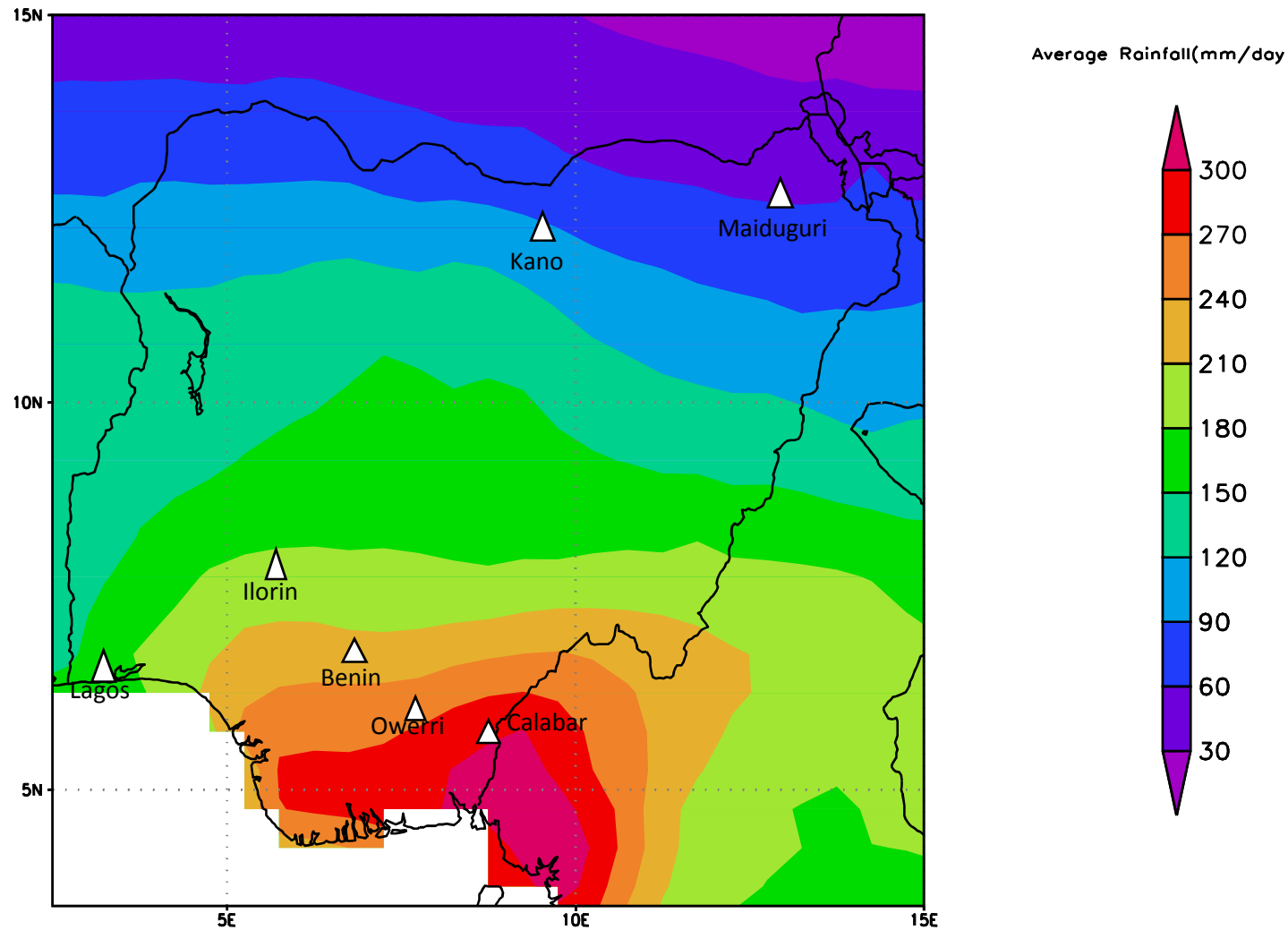
- **Period: 1981-2010**
- **Station: Six Synoptic Stations**

In this analysis, daily averages of rainfall (in millimeters) for four synoptic station (see table 1 below) spanning 30 years (January 1981 to December 2010) acquired by the Nigeria Meteorological Agency (NIMET) were used

S/N	Station Name	Station Number	Lat	Lon	Daily Data
1	Kano	65046	12.0	8.52	1981-2010
2	Owerri	65252	5.48	7.02	1981-2010
3	Calabar	65264	4.95	8.32	1981-2010
4	Benin	65263	6.32	5.60	1981-2010

Nigeria

Climatological Distribution of rainfall

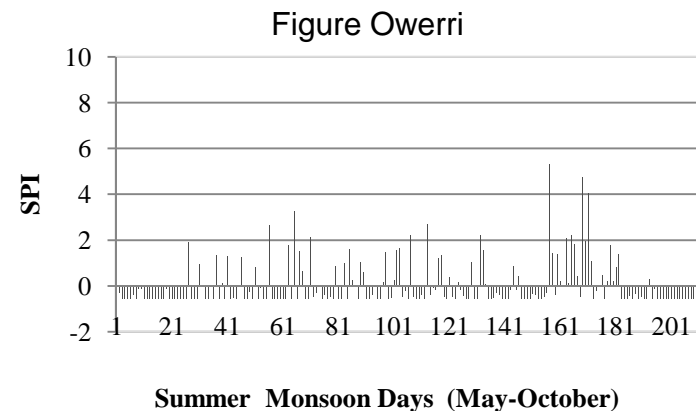
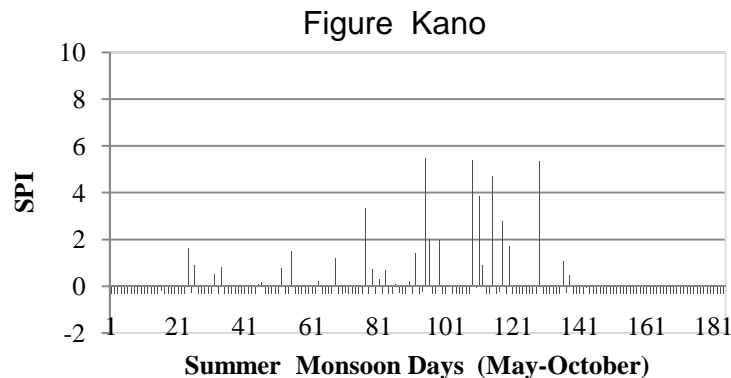
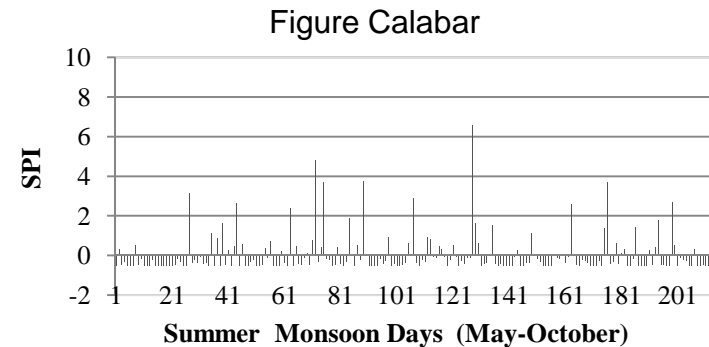
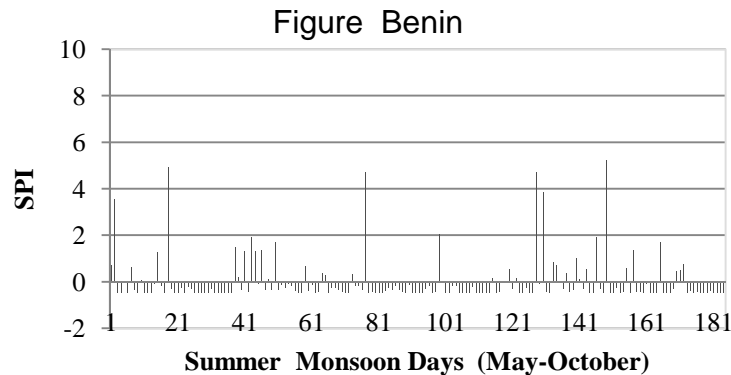


Thirty Years Average Rainfall climatology over Nigeria

Nigeria

Standardized Precipitation Index

Standardized Precipitation Index was used to evaluate the evolution of extreme wet and dry event days, as well as the extent of severity of the extreme events.



Standardized Precipitation Index for the wet/dry days in the rainy season months in 1983; The distribution of extreme rainfall days modeled as $SPI > 2$ are shown in the figures for the sites

Nepal

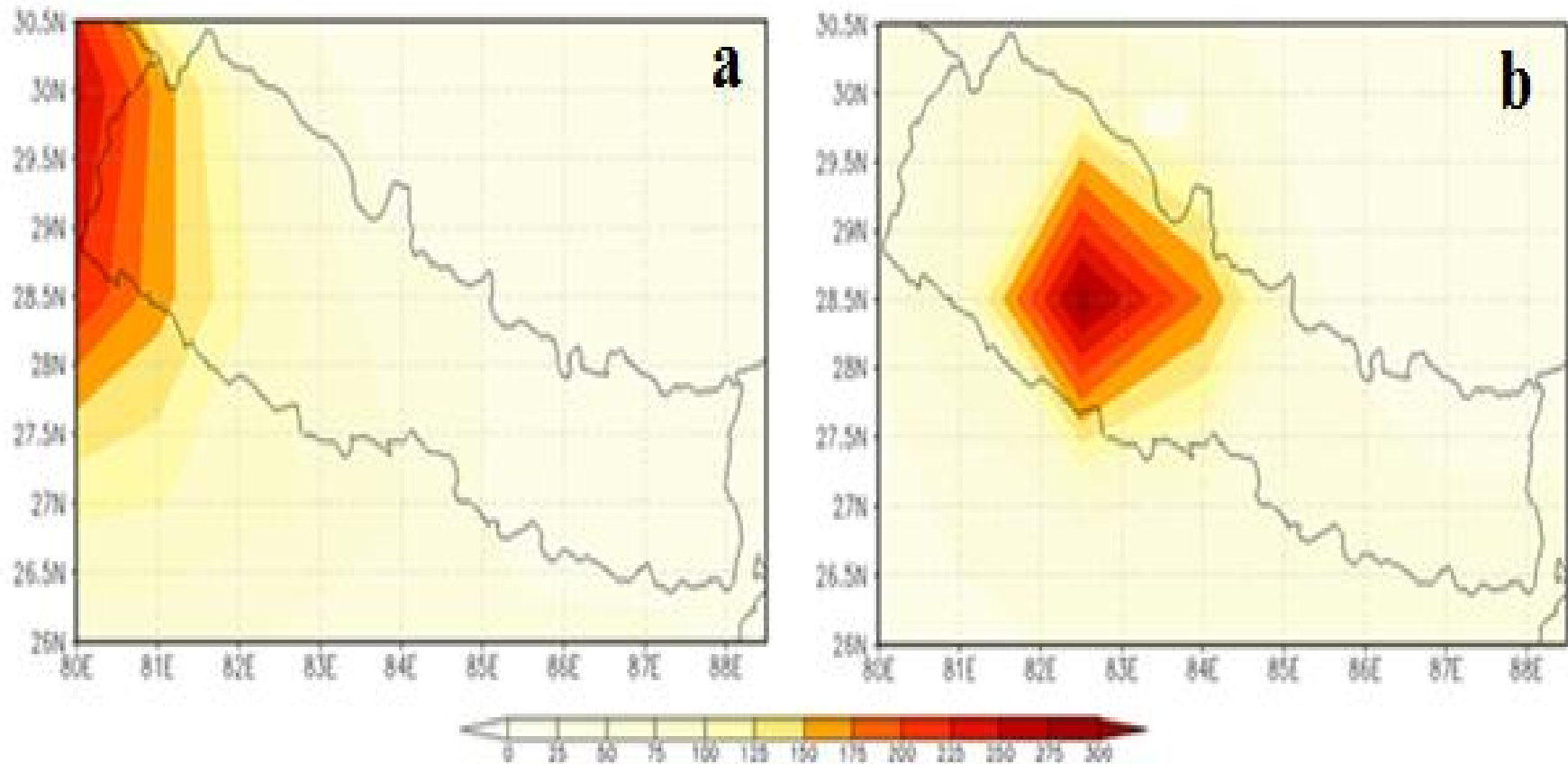
- **Extreme rainfall event of June 2013 in Nepal is analyzed, 17 and 18 June 2013 record breaking rainfall event was occurred in the western part of Nepal**

Water Level increased in rivers

- **Seti River: 6.94 to 11.56 m**
- **Karnali River: 5.53 to 12.81 m on 17 June, as measured by DHM Nepal's real time network.**
- **Similarly, the discharge in Mahakali River increased 139,000 cfs to 440,716 cfs on 17 June 2013**

Nepal

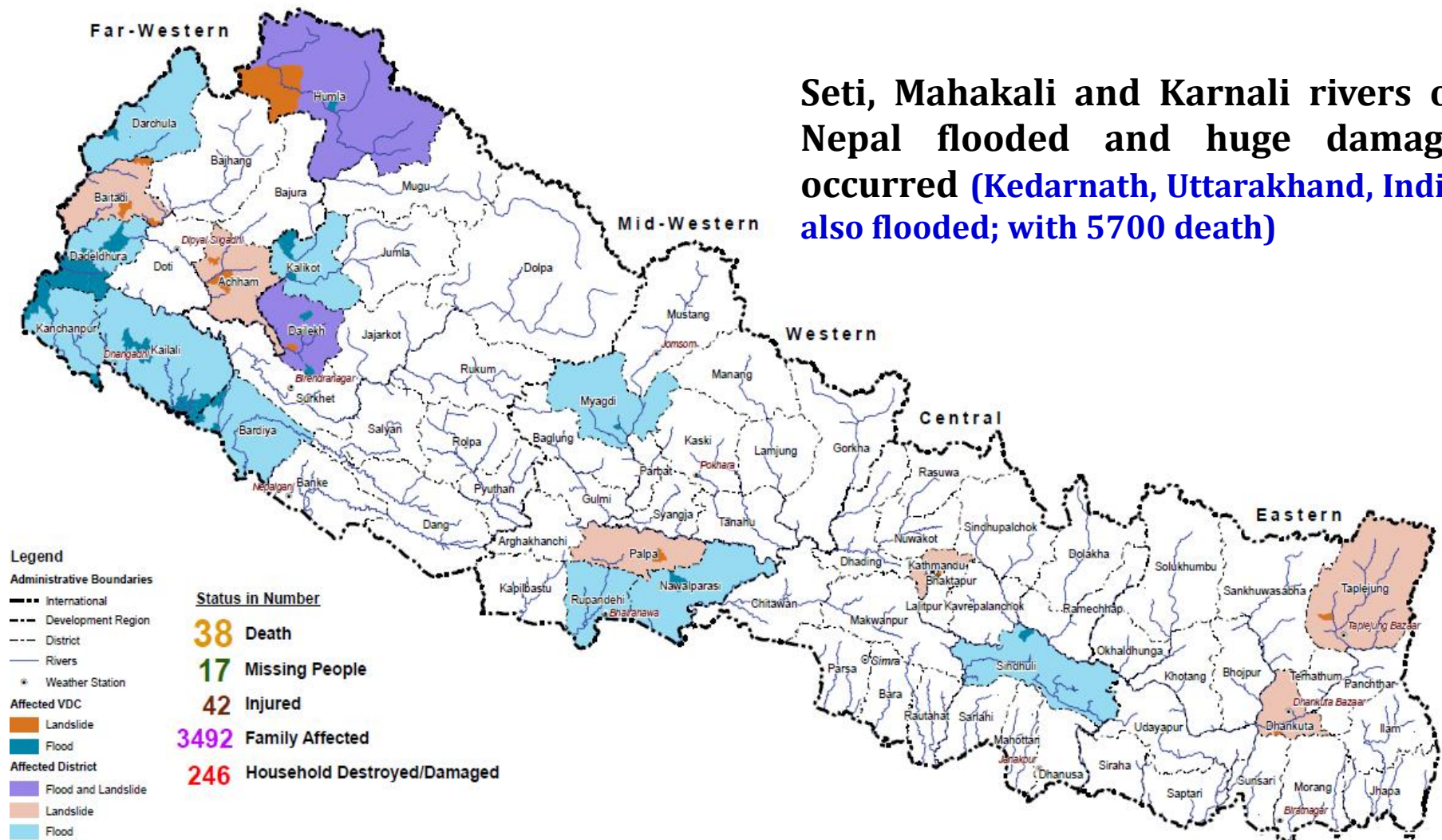
Extreme Rainfall Event of Nepal in June 2013 (June 17-18)



Daily total rainfall in mm (a) 17 June 2013 and (b) 18 June 2013
Maximum 24 hours rainfall of up to 200 mm received

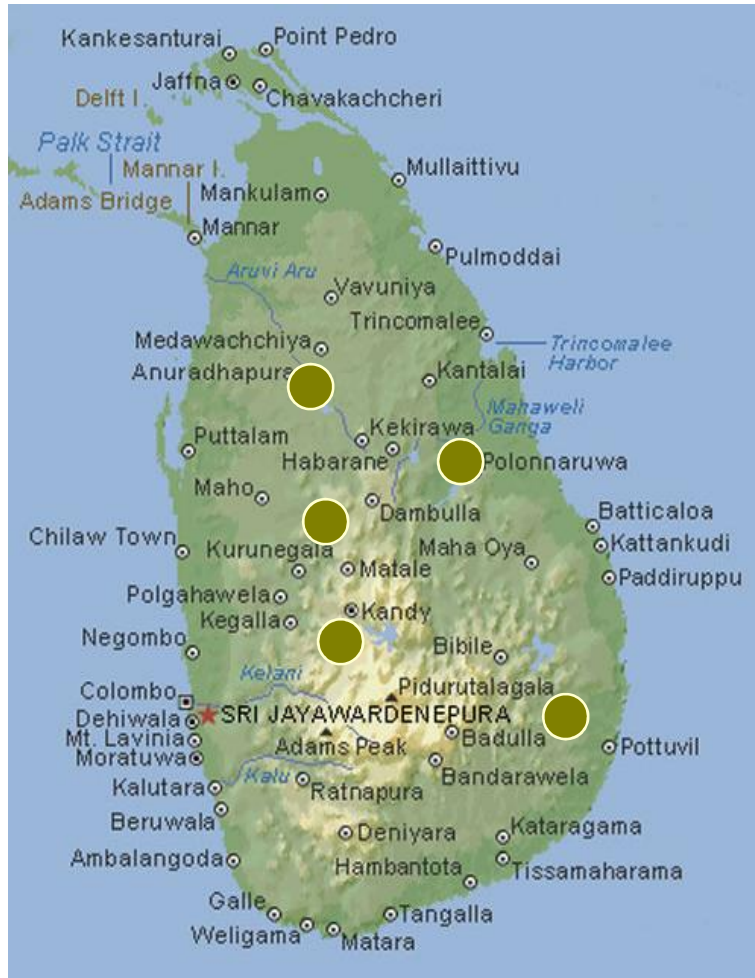
Nepal

Flood and landslide affected areas during the extreme rainfall event of June 2013



Selection of 5 weather Stations

Sri Lanka Map

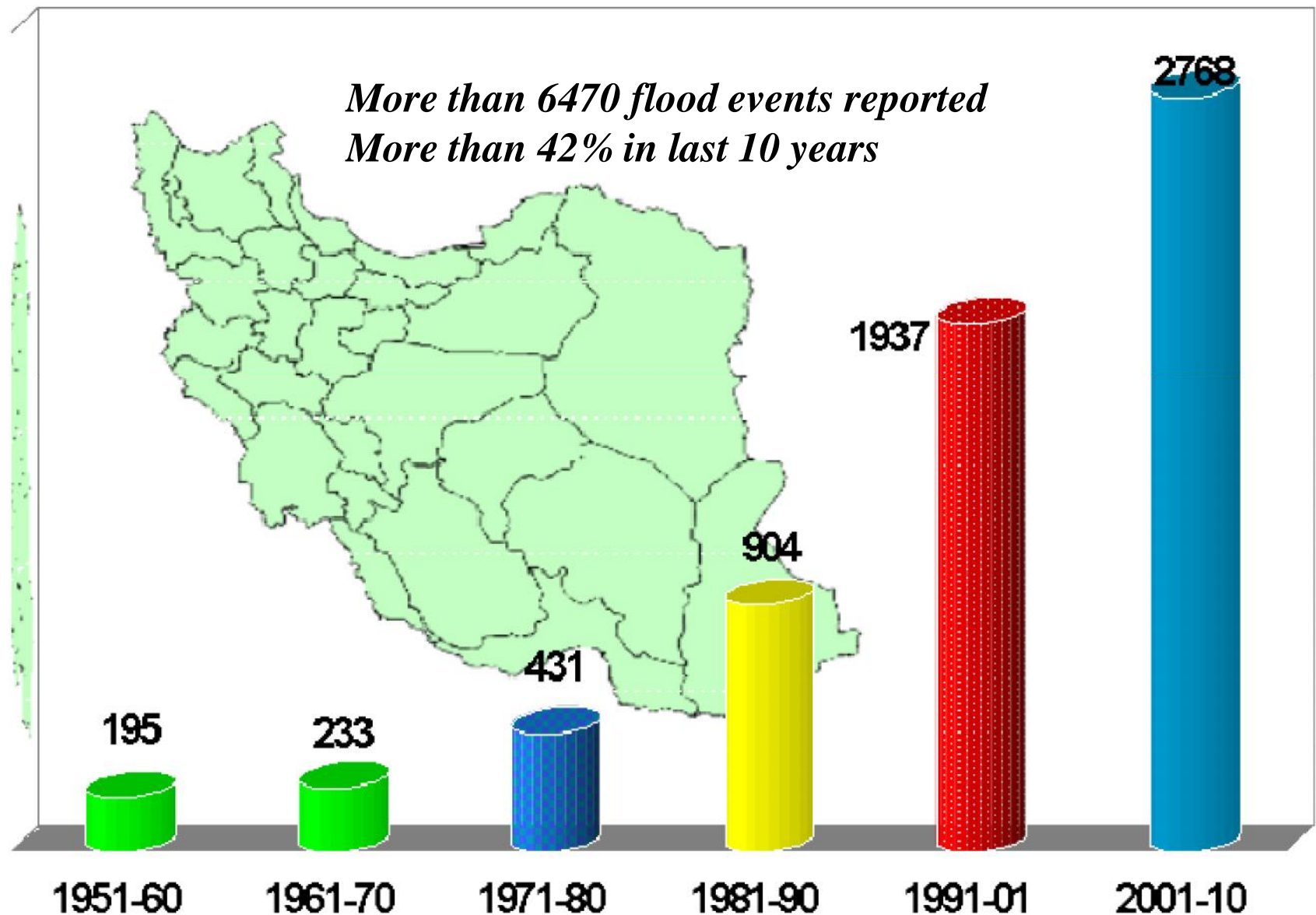


Stations are selected based on several criteria given below.

- Vulnerability of the geographic location and topology for natural disasters
- Archaeological significance of the site
- Level of accessibility of the site to gather information
- Proximity of the site to a meteorological data collection centre

IRAN

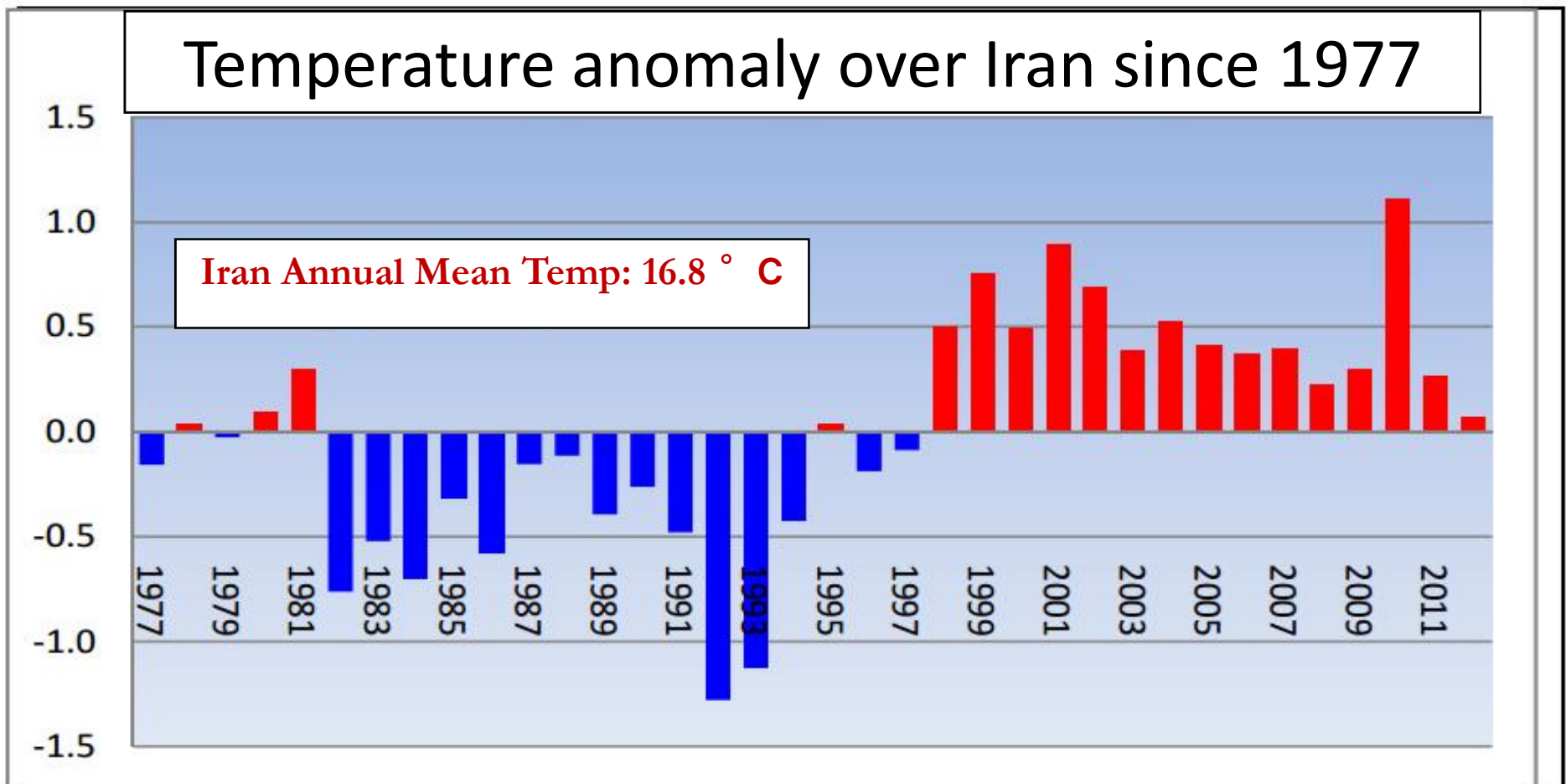
Increasing flood events in IRAN During the Past 60 years



IRAN

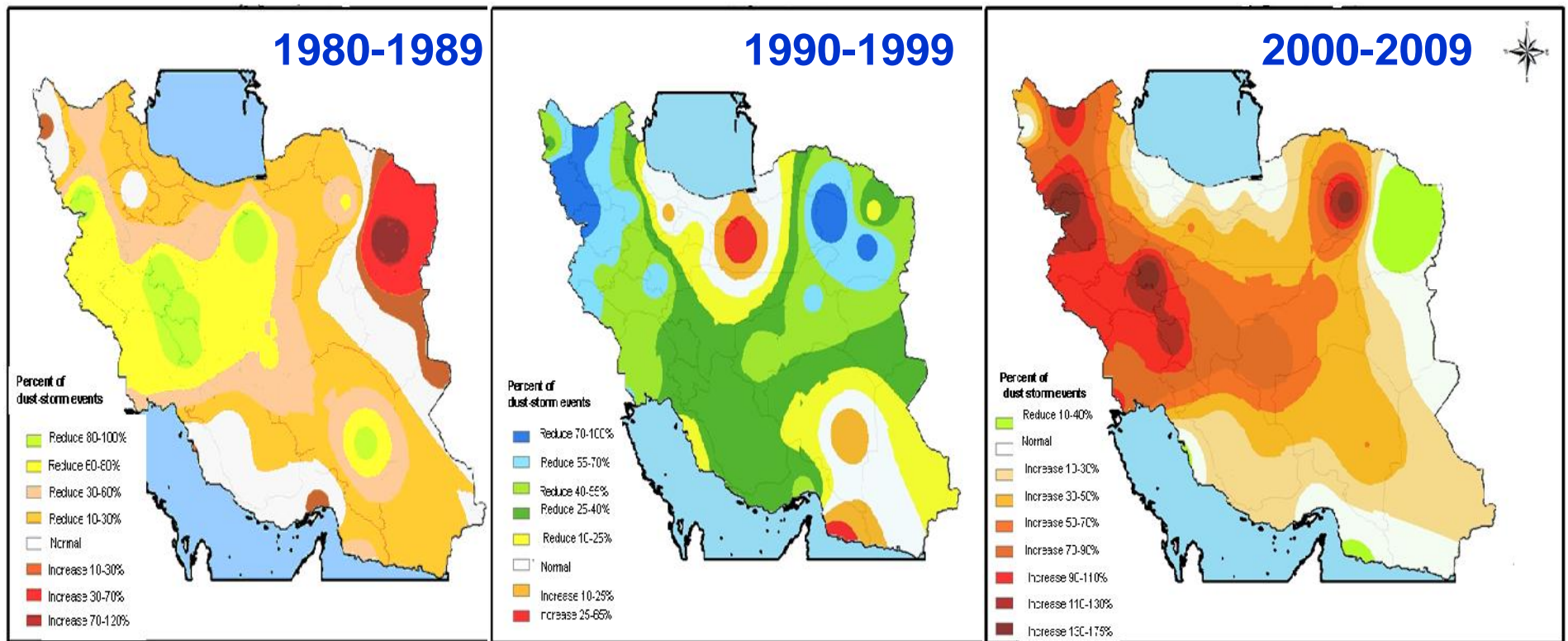
Temperature Anomalies:

2010 is the warmest year in Iran during the period of 1977-2012. and, 1992 is the coldest year in the same period.



IRAN

Percent of dust storm events : a comparison of the three decades to the long term average of 1980 – 2009 in Iran



Both two decades of 1980-89 and 1990-99, show decreasing condition in the dust frequency in most areas of the country. While in the last decade, throughout the country (except for some areas in the northeast and north), an increasing dust frequency is evident, as the increase of dust frequency ranges from 70-175 percent in some western parts.

Capacity Building - International Training Workshop

2013 ICCES International Training Workshop on “Extreme Weather and Climate Event: detection, monitoring, prediction and risk management for developing countries” was held on July 14-23, 2013, Beijing.



More than 60 scientists, including 29 overseas participants from 14 developing countries attended the training workshop.

Capacity Building - International Training Workshop

The main objective of the workshop was to enhance the capacity building for developing countries to tackle with the extreme weather and climate events, focusing on three aspects:

- (i) Observation of extreme events and its detection;
- (ii) Monitoring and prediction of extreme events;
- (iii) Risk management of extreme events.



Capacity Building - International Training Workshop

13 selected participants presented their research results and showed various aspects of the related topics in different countries, including droughts, floods, heat waves and the society impact of extreme events to developing countries.



Capacity Building – Short-term Visiting

Visiting Program

- ◆ 3 Brazilian young scientists had been working at ICCES for 1 month
- ◆ 1 Nigerian young scientist had been working at ICCES for 3 months
- ◆ 2 American leading scientists from the University of Arizona and the University of Wyoming visited ICCES
- ◆ 1 Australian leading scientist from Commonwealth Scientific & Industrial Research Organization visited ICCES



III. Plan for Group Activities of COMSATS ITRG during 2014-2015



- 1. 2014 ICCES international training workshop**
- 2. The 4th ITRG meeting (Tentatively)**
- 3. Short-term visiting scholars and PhD students**
- 4. More member countries to join in**



2014 ICCES International Training Workshop

Basic Information:

1. Theme: Asian Monsoon Variability and Predictability
2. Time: 6-15 July, 2014
3. Venue: Beijing

Tentative Sessions

- a) Asian monsoon: general description
- b) Indian summer monsoon
- c) Asian winter monsoon
- d) Modeling and predictability of the Asian monsoon
- e) The global monsoon system and the East Asian monsoon

Welcome to join us!

<http://2014icces-trainingworkshop.csp.escience.cn>



2014 ICCES International Training Workshop

Lecturers

Name	Institute	Topic
Prof. Yihui Ding	National Climate Center, China	Asian Monsoon: general description
Prof. Hisashi Nakamura	The University of Tokyo, Japan	Asian Winter Monsoon
Prof. Song Yang	Sun Yat-Sen University, China	Modeling and Predictability of the Asian Monsoon
Dr. Zengzhen Hu	National Oceanic and Atmospheric Administration, USA	ENSO Variability and Predictability
Prof. Feng Xue	ICCES, IAP, CAS, China	The Global Monsoon and the East Asian Monsoon
Prof. Riyu Lu	LASG, IAP, CAS, China	The Western Pacific subtropical high and the blocking over East Asia

2014 ICCES International Training Workshop

Committees

Prof. Qingcun Zeng, ICCES, IAP, CAS, China

Prof. Yihui Ding, National Climate Center, China

Prof. Jiang Zhu, ICCES, IAP, CAS, China

Prof. Song Yang, Sun Yat-Sen University, China

Prof. Zhaohui Lin, ICCES, IAP, CAS, China

Prof. Bueh Cholaw, ICCES, IAP, CAS, China

Prof. Feng Xue, ICCES, IAP, CAS, China

Prof. Ziniu Xiao, China Meteorological Administration, China

4th Thematic Research Group Meeting



13th CTWF Meeting on “Extreme Weather and Climate: Past, Present, Future”, to be held in September 8-11, 2014, Beijing, China

Tentative Sessions

- a) Inland and Coastal Flooding
- b) Heat Wave and Drought
- c) Extreme Events of Air Pollution
- d) Society Impact of Extreme Events

- According to the Action plan discussed in the 3rd ITRG meeting, eligible active group members will be selected to participate in the CTWF workshop, and Present research findings in CTWF 2014
- Tentatively, the 4th ITRG meeting will be organized along with the CTWF 2014 meeting.





Short-term visiting scholars and PhD students

- **Under the support of COMSATS, CAS, TWAS, ICCES can:**
 - ◆ Invite selected ITRG member as the visiting scholars for collaborative research on the extreme events in their respective countries
 - ◆ Encourage young scholars from developing countries to apply for CAS-TWAS president's Fellowship for PhD study
 - ✓ 8 people submitted the application form
 - ✓ Two of them, one from Nigeria, one from Thailand successfully obtained the scholarship

How to join us (ITRG-CCEP)

Open to all research institutions from COMSATS member countries. Those who are interested in joining with us, please follow the procedures:

Preparing the proposal on the extreme events weather and climate studies for respective countries:

1. Specify the topics on extreme events: Drought, Flooding, Dust Storm, etc
2. Identify the focal point both for research and management for respective group
3. Describe the feasibility of the research project, especially the availability of the meteorological datasets needed for the research
4. Draft working plan and timeline for the execution of the project



Submit the proposal to group leader, and modify the proposal as suggested



Discussion of Group leader with COMSATS for final decision



Formal Certification Letter from COMSATS and Group

More approaches of Cooperation with ICCES

1. International projects (ICCES-COMSATS projects);
2. Joint papers/publications under the projects;
3. Short -term visiting of both students and research scientists;
4. Co-supervising students / full time Ph.D;
5. Joint Training Workshops / conferences;
 - cooperative institutes/centers
 - ICCES
 - COMSATS
6. Programs
 - CAS-TWAS president's Fellowship
 - CAS Fellowship for Postdoctoral and Visiting Scholars from Developing Countries
 - CAS Visiting Professorships for Senior International Scientists



Thank You !