# Annexes

## 1. Pictures in activities in each field

## 2. Outputs (in separate volumes)

| Field | | Outputs |
|---|---|---|
| Annex 1 | Numerical Weather Prediction | Middle-term forecast (provided once a day) |
| Annex 2 | Climate Change Projection | Information on climate change due to global warming over Mongolia |
| Annex 3 | Weather Forecasting | Short-term forecast (provided twice a day) |
| | | Long-term forecast (provided twice a year) |
| | | Computer-aided case study handbook on typical and unusual phenomena |
| Annex 4 | Weather Interpretation Method | Suggestion for the Precipitation Guidance using Product of RSM of mean rainfall amount |
| Annex 5 | Drought/Dzud Early Warning System<br>GIS Technique<br>Zoo-meteorology | Information on drought/dzud provided annually (at the end of August)<br>Maps of pasture biomass on the village (bag) scale, outline |
| | | Information on drought/dzud provided on the web<br>(Vegetation map, Biomass map, Drought map and Snow map) |
| | | Maps of plant height on the village (bag) scale |
| | | Guideline of warning and advisory messages |
| | | Revised zoo-meteorological observation program |
| | | Revised zoo-meteorological observation manual |
| Annex 6 | Use of Weather Information | Participants list of workshops |
| | | Results of questionnaire survey |
| | | Leaflet on practical use of weather information |
| Annex 7 | Operation and Maintenance of Weather Radar System | Operation and maintenance manual of weather radar system |
| | | AVR and UPS Check Sheet (Weekly) |
| Annex 8 | Computer Networking | Overall plan of computer network in NAMHEM |
| | | The problems and the future expansion plan of the NAMHEM network |
| Annex 9 | Dust and Sand Storm (DSS) Monitoring Network | Equipment for Kosa Monitoring Network |
| | | DSS monitoring data |

Pictures

## 1. Pictures in activities in each field

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| Lecture on Numerical Weather Prediction/Climate Change Projection | July 2005 |

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| Lecture on Numerical Weather Prediction/Climate Change Projection | July 2005 |

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| Lecture on Numerical Weather Prediction/Climate Change Projection | July 2005 |

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| Lecture on Numerical Weather Prediction/Climate Change Projection | July 2005 |

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| Seminar on Numerical Weather Prediction and Weather Forecasting | May 2005 |

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| Lecture on Weather Forecasting | August 2005 |

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| Lecture on Weather Forecasting Guidance | August 2005 | Lecture on Weather Forecasting Guidance | September 2005 |
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| Lecture on GIS for Drought/Dzud Early Warning System (DDEWS) | September 2005 | Training on GIS for DDEWS | September 2005 |
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| Training on Zoo-meteorology for DDEWS | August 2005 | Training on Zoo-meteorology for DDEWS | August 2005 |

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| Seminar on Use of Weather Information in Ulaanbaatar | May 2005 | Seminar on Use of Weather Information in Ulaanbaatar | May 2005 |
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| Workshop on Use of Weather Information in Gobi Altai | August 2005 | Workshop on Use of Weather Information in Dondgobi | August 2005 |
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| Workshop on Use of Weather Information in Khentii | August 2005 | Workshop on Use of Weather Information in Ulaanbaatar | September 2005 |

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| Training on Operation and Maintenance of Weather Radar | May 2005 | Training on Computer Networking | May 2005 |
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| Computers Procured for Training on Numerical Weather Prediction, Climate Change Projection and Weather Forecasting | September 2005 | Copier Procured for Use of Weather Information | September 2005 |
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| Electric Scales Procured for DDEWS | July 2005 | Weighing Instrument Procured for DDEWS | July 2005 |

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| Counter part training at Yokohama Local Weather Observatory(Yokohama) | December 2005 | Counter part training at Yokohama Local Weather Observatory (Yokohama) | December 2005 |
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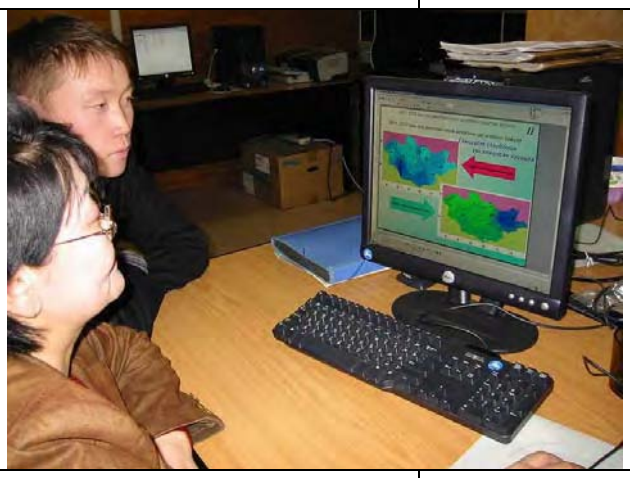
| Counter part training at Meteorological Instrument Test Center(Tukuba, Ibaraki) | December 2005 | Certificates for Counter part training at JICA Tokyo Center(Tokyo) | December 2005 |
|  | |  | |
| Designing for a case study hand book | February 2006 | Weather forecast guidance (Neural Net) | February 2006 |

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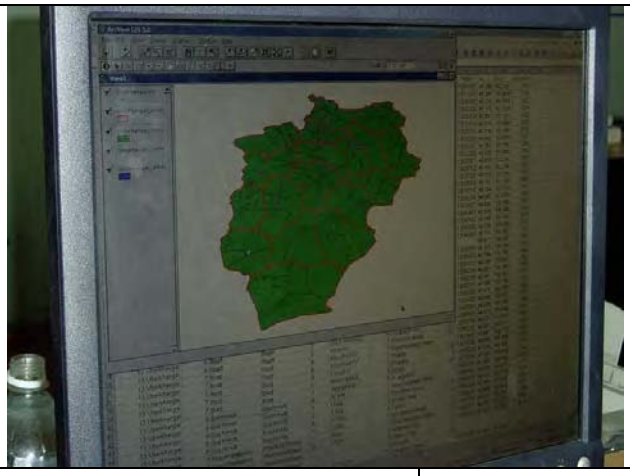
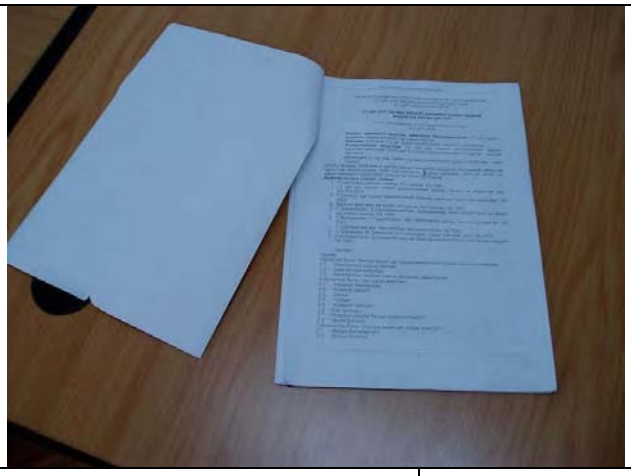
|  | |  | |
| Mapping work for pasture condition map | January 2006 | Revising of zoo meteorological observation manual | January 2006 |
|  | |  | |
| Counter part training at Meteorological Research Institute (Tsukuba) | December 2005 | Training on the Japanese Meteorological Satellite(HIMAWARI) | February 2006 |
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| National seminar for meteorologist for fiscal year 2006 | February 2006 | Weather guidance lecture | February 2006 |

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|  | |  | |
| Training in Japan for private weather service at Japan Weather Association (Ikebukuro, Tokyo) | January 2007 | Training in Japan for Data Assimilation Technique at Meteorological Research Institute (Tsukuba, Ibaraki) | January 2007 |
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| DDEWS: Training in Japan, Dr. Nachin's lecture at the JICA Tokyo Center | January 2007 | DDEWS: Training in Japan, at the entrance of the Arid Dome, Tottori University | January 2007 |
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| Evaluation ceremony at JICA Tokyo Center for training in Japan | January 2007 | Lecture on modeling of numerical weather prediction at NAMHEM | February 2007 |

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| Lecture on Very Short Range Precipitation Forecast at NAMHEM | February 2007 | Training on the bag scale pasture condition map (DDEWS) at NAMHEM | February 2007 |
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| Workshop for the utilization of weather information in Gobi - Altai province | June 2006 | Workshop for the utilization of weather information at NAMHEM | June 2006 |
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| Mid-term Evaluation by JICA at NAMHEM | August 2006 | Signing of minutes of Mid-term Evaluation at NAMHEM | August 2006 |

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| Discussion on daily maximum/minimum temperature guidance newly developed | March 2008 | Pasture condition map made for Drought/Dzud Early Warning System (DDEWS) | March 2008 |
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| Workshop for the utilization of weather information Binder soum, Khentii aimag | June 2007 | Leaflet on practical use of weather information | June 2007 |
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| Workshop for the utilization of weather information Gobi – Altai, Altai aimag | October 2007 | Workshop for the utilization of weather information Mandal Gobi, Dundgobi aimag | October 2007 |

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| Practical Training on operation and maintenance of weather radar Morin-uul Meteorological Radar Tower | June 2007 | DSS Monitoring System NAMHEM Head Office, Ulaanbaatar | September 2007 |
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| DSS Monitoring System Sain Shand aimag center | September 2007 | DSS Monitoring System Zamin-uud Observatory | September 2007 |
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| DSS Monitoring System Dalanzadgad aimag center | September 2007 | OJT for DSS Monitoring System Dalanzadgad aimag center | September 2007 |

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| Workshop for the utilization of weather information<br>Erdenedalai soum, Dundgobi aimag | Jun. 2008 | Workshop for the utilization of weather information<br>Altai, Gobi-Altai aimag | Jun. 2008 |
|  | |  | |
| Workshop for the utilization of weather information<br>Dadal soum, Khentii aimag | Jun. 2008 | Workshop for the utilization of weather information<br>Ulaanbaatar | Jun. 2008 |
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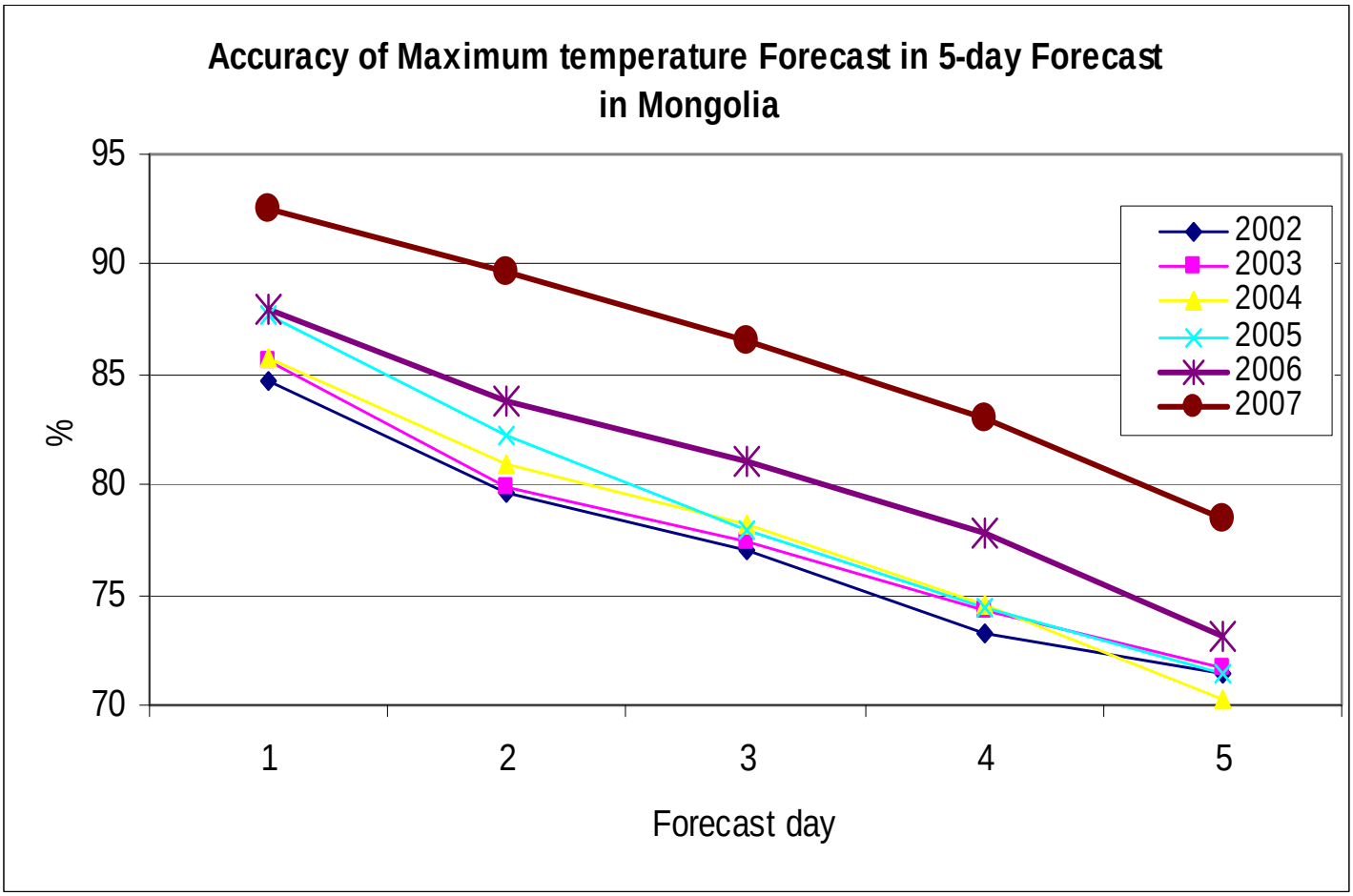
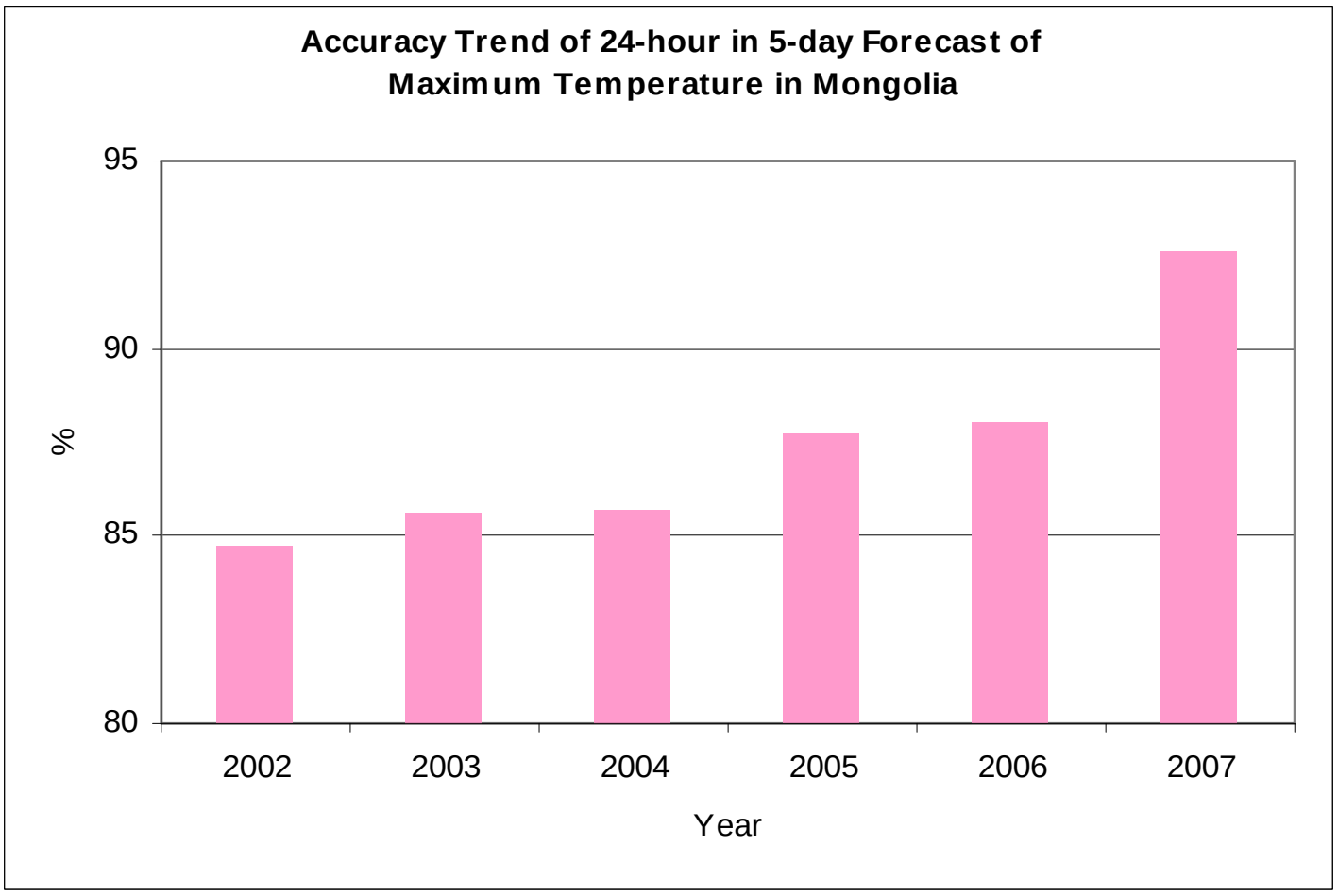
| DSS Monitoring System<br>Comparison sampling of PM10<br>Zamin-uud Observatory | Jun. 2008 | DSS Monitoring System<br>Adjustment of the sampler's inlet<br>Dalanzadgad aimag center | Jun. 2008 |

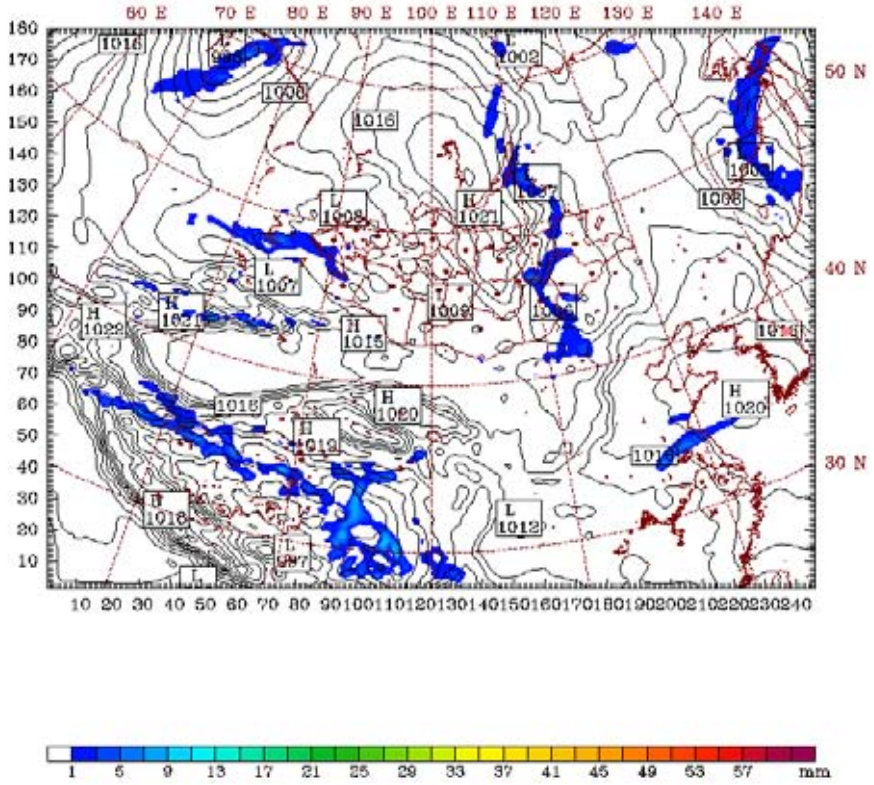
# Annex 1　Numerical Weather Prediction

- Middle-term forecast (provided once a day)

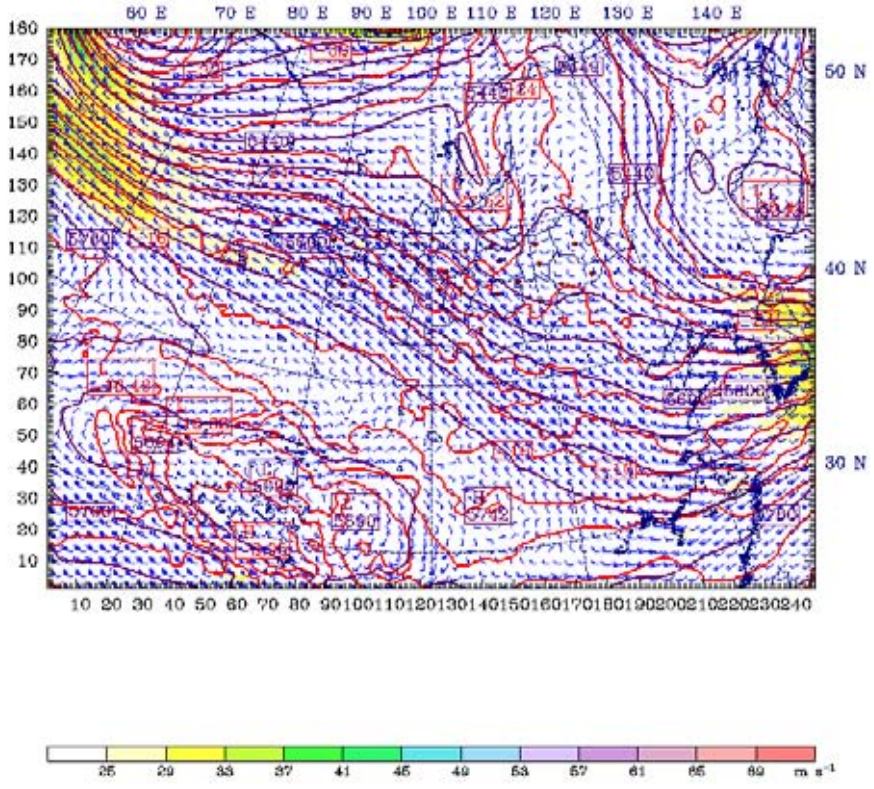

Accuracy of Maximum temperature Forecast in 5-day Forecast in Mongolia
95
90
85
80
75
70
%
1
2
3
4
5
Forecast day
2002
2003
2004
2005
2006
2007


Accuracy Trend of 24-hour in 5-day Forecast of Maximum Temperature in Mongolia
95
90
85
80
%
2002
2003
2004
2005
2006
2007
Year

Dataset: R1 RIP: rain-18 Init: 1200 UTC Tue 22 Apr 08
Fcst: 120.00 Valid: 1200 UTC Sun 27 Apr 08 (2000 LST Sun 27 Apr 08)




Dataset: R1 RIP: wind5-18 Init: 1200 UTC Tue 22 Apr 08
Fcst: 120.00 Valid: 1200 UTC Sun 27 Apr 08 (2000 LST Sun 27 Apr 08)

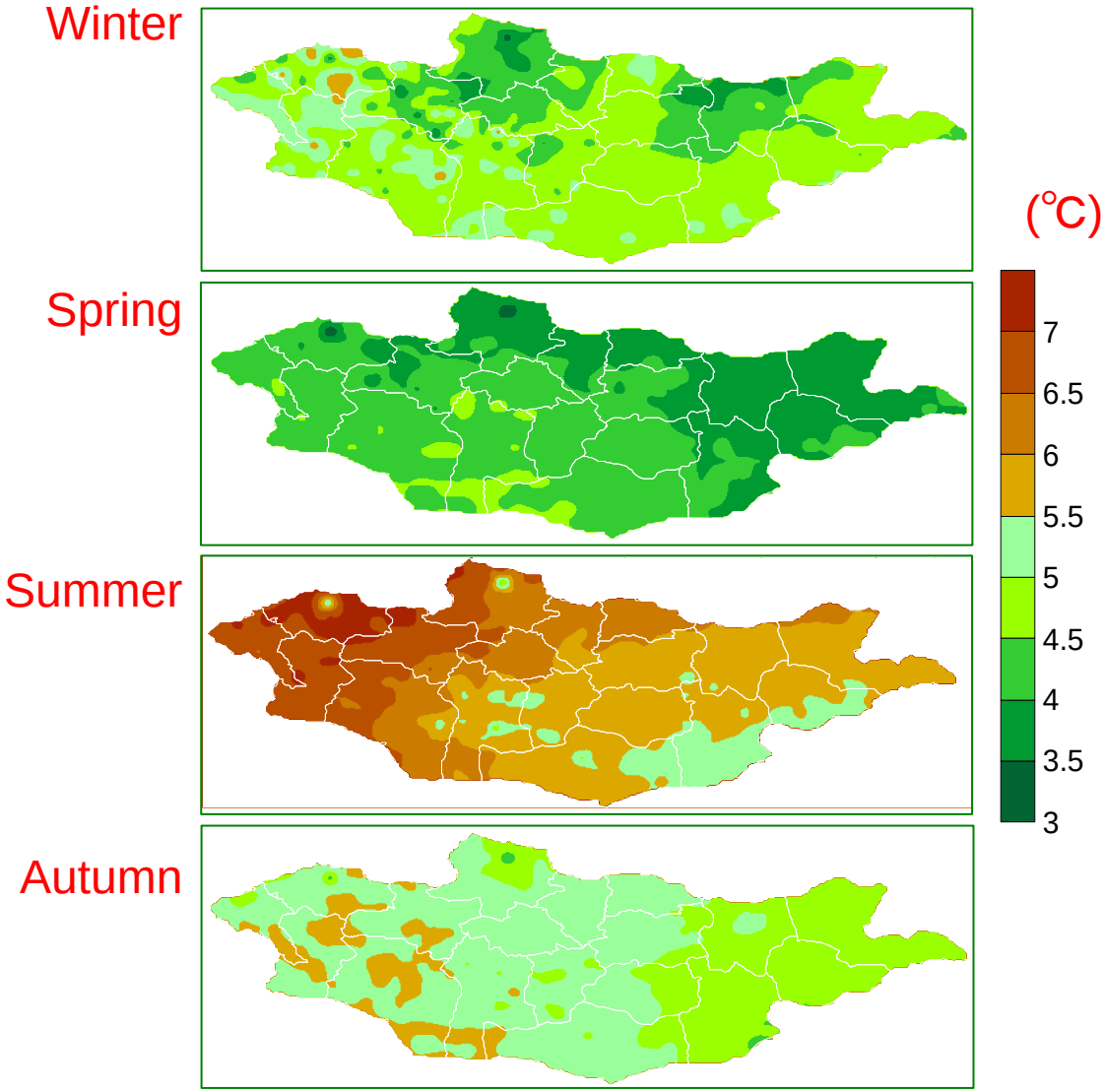


# Annex 2　Climate Change Projection

- Information on climate change due to global warming over Mongolia

# Climate Change Projection

/ Temperature: (2071～2100)－(1981～2005) /



# Climate Change Projection

/ Precipitation: (2071～2100) －(1981～2005) /