

WEB GIS Based Typhoon Disaster Information System

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1 Introduction

2 Activities of TC and WGDRR

3 WEB GIS Based TCDIS

4 Conclusions

- **Introduce of TC Activities**
 - ✓ WGDRR Annual Workshop on Seoul, Korea
 - ✓ Expert Mission for TC Members
 - ✓ TC Integrated Workshop
 - ✓ TC Session

- **Report on Members DMS & EWS**
 - ✓ Collect 12 TC Members Report
 - ✓ Summary and Analysis to *Suggest NEW Guideline*

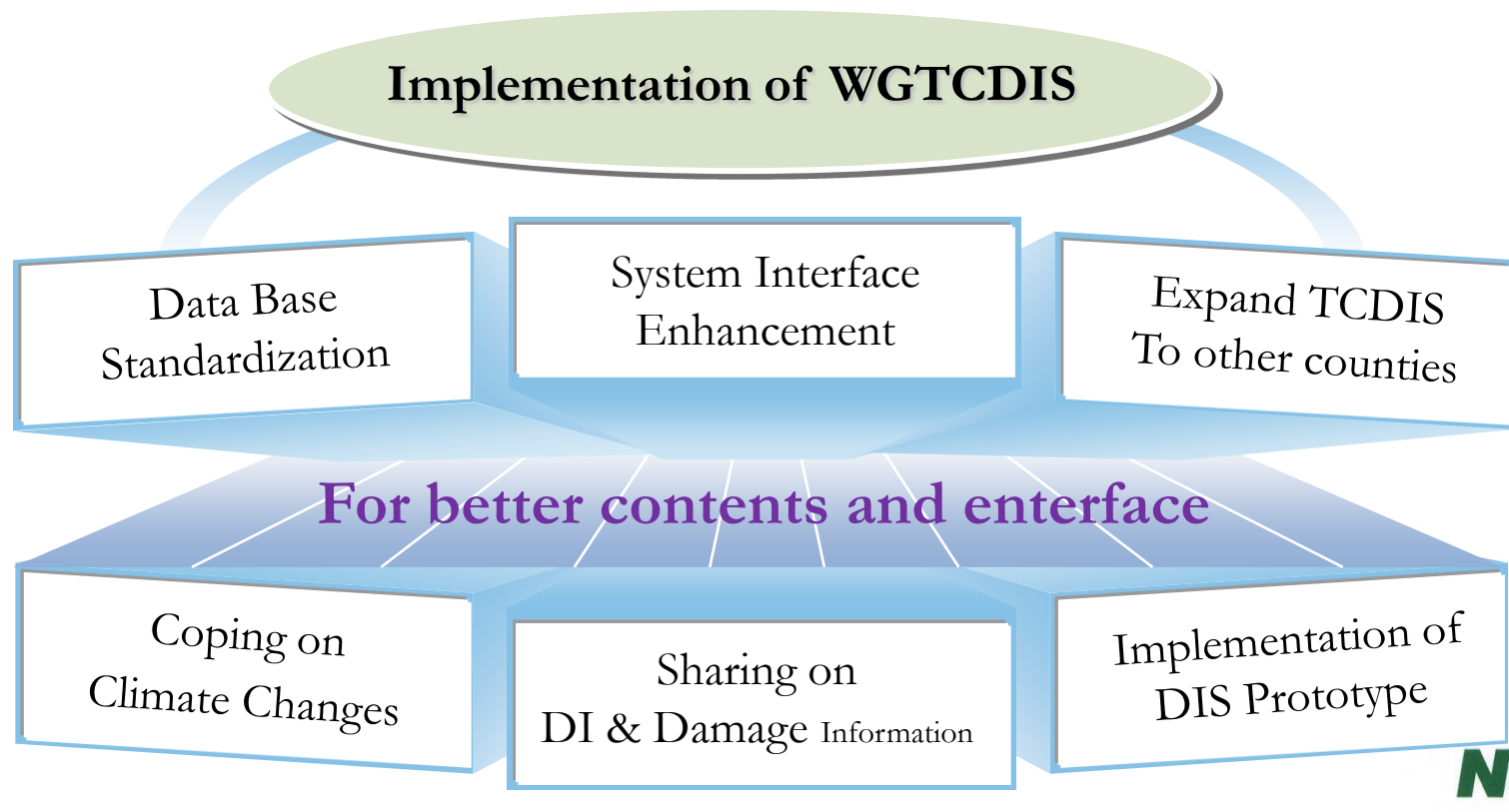
- **WEB GIS Based TCDIS**
 - ✓ Collect TC Members Disaster Information Data
 - ✓ Develop A New Analytical Method for WGTCDIS

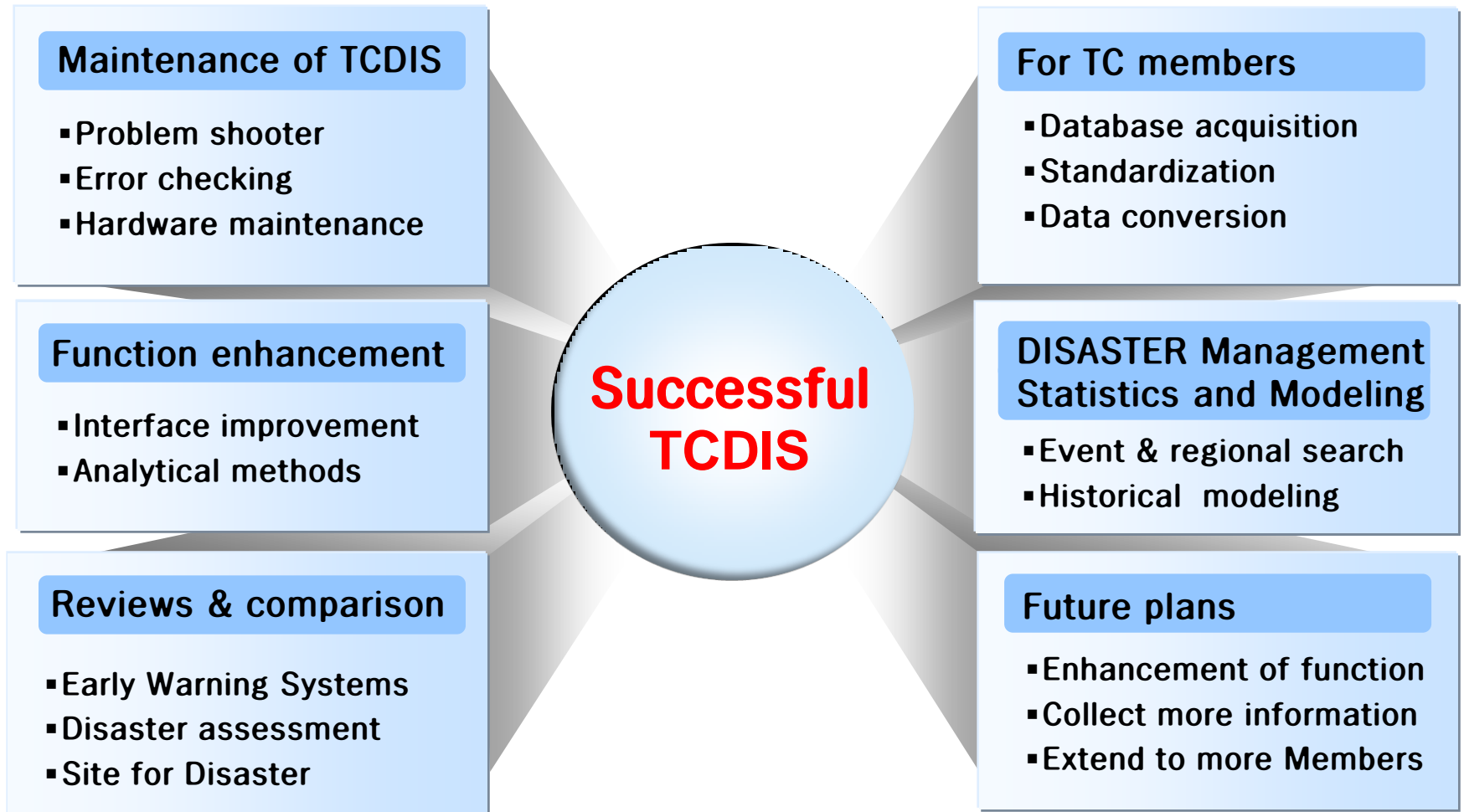
- **Promote the TCDIS to the WGTCDIS**
 - Develop new interface and statistical method
 - Find typhoon trajectory and estimation of typhoon related damages

- **Research for risk management system**
 - Survey of risk management institute
 - Analysis disaster related site to make distinction

- **Application of Web GIS based TCDIS**
 - Establishment of WGTCDIS for Members
 - Tool for Early warning system

- To combine domestic DIS and TCDIS into one WEB GIS based system
- To try standardizing climate and disaster information for WGTCDIS
- To build EWS and DMS to reduce the damages from extreme events by sharing information and results of research





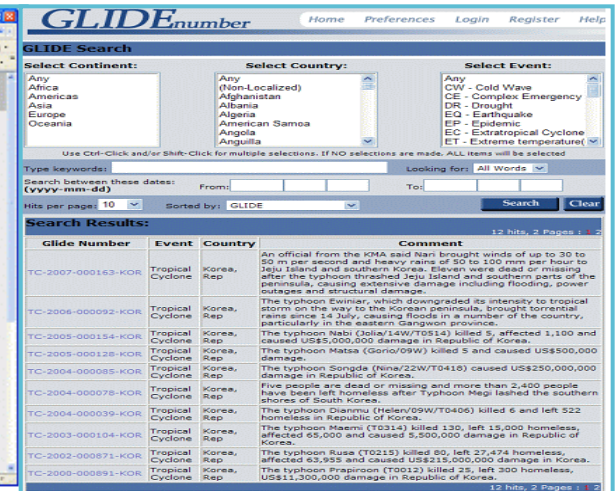
To make a effective WEB GIS based TCDIS



ADPC
(Asian Disaster Preparedness Center)



ADRC
(Asian Disaster Reduction Center)



GLIDE Number
(Global IDentifier Number)

- Nonprofit
- Regional Response to DPP
- Manage training of DPP
- Weak of DPP information

- 27member countries DI
- Public inform. for DPP
- Annual disaster reports
- Weak of statistical inform.

- Report on outline of disaster
- Define nationally/yearly
- Weak of statistical inform
- Weak of specific dis. Inform.

To promote WEB GIS based TCDIS and suggest new system



Natural hazards and the risks they pose to
South-East Queensland

Swiss Re
iii

sigma

Natural catastrophes and man-made
disasters in 2004:
more than 300 000 fatalities,
record insured losses

- ArcGIS based natural dis. risk manage. S/W

- Physical Hazard modeling
- Detailed disaster information DB
- Risk analysis modeling
- No consider historical damages
- Need lots of information

- General typhoon damage analysis

- Based on local disaster damages
- Local based DB
- Use meteorological information
- Historical data based risk manage.
- Need met.-damages information

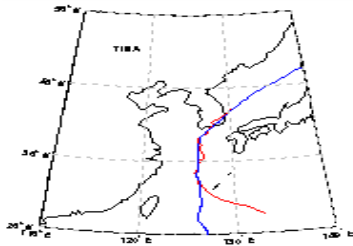
- Historical based risk management

- Based on national disaster
- Risk modeling for insurance
- Difficult to apply in developing countries have low insurance subscriber

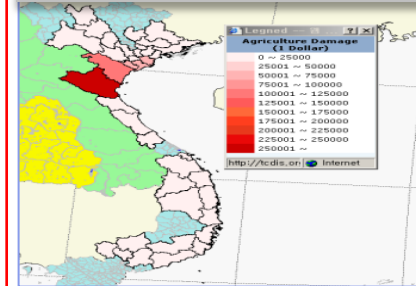
Detailed Damage Info in Member



Similar Typhoon



Estimated Rain & Wind



Comparative Study

Disaster Type

Damage

Damage Region

Modification & Mitigation Strategy

[Home](#) | [News Release](#) | [Weather/Earthquake](#) | [User's Guide](#) | [Mission](#) | [FAQ](#) | [RSS Feeds](#)

[Home](#) > [For NHK](#) > [RSMC Tokyo - Typhoon Center](#)
 RSMC Tokyo - Typhoon Center

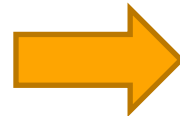
Welcome to RSMC Tokyo - Typhoon Center

RSMC Tropical Cyclone Information
 The Regional Specialized Meteorological Center (RSMC) Tokyo - Typhoon Center provides information on tropical cyclones in the western North Pacific and the South China Sea, including present and forecast positions as well as the movement and intensity of tropical cyclones.
 Please note that information issued by the RSMC Tokyo - Typhoon Center represents neither official analysis/forecasts nor warnings for the areas concerned. Such official information is issued by the National Meteorological Services of individual countries.

[Notes on RSMC Tropical Cyclone Information](#)

- Names of Tropical Cyclones
- Climatology of Tropical Cyclones
- Best Track Data (1951-2007)
- Annual Report on Activities of the RSMC Tokyo - Typhoon Center
- Technical Review
- About RSMC Tokyo - Typhoon Center

RSMC(Japan)



66666	5101	10		5101	0	6
51021906	002	2	200	1385	1010	
51021912	002	2	200	1385	1010	
51021918	002	2	230	1421	1000	
51022000	002	9	250	1460	994	
51022006	002	9	276	1506	994	
51022012	002	9	289	1533	994	
51022018	002	9	313	1575	992	
51022100	002	9	326	1621	990	
51022106	002	6	339	1660	990	
51022112	002	6	360	1700	990	
66666	5102	37		5102	0	6
51031806	002	2	57	1583	1002	
51031812	002	2	60	1594	1002	
51031818	002	2	64	1604	1000	
51031900	002	2	67	1614	1000	

RSMC Data Format

1951~
 Total 1515

JTWC Typhoon Warning Center Products

Executive Products
 Products on this website are intended for use by U.S. government agencies. Please consult your national meteorological agency or the appropriate United States meteorological organization. Regional Specialized Meteorological Center for tropical cyclone products pertinent to your country, region and/or local area.

Mission Statement
 Products and Services include:

- **Forecast and Track Data**
- **Warning Graphic**
- **Ship Avoidance**
- **Wind Probabilities**
- **TC Names**
- **Graphical Warnings/Advisors**
- **ATOL Archive**
- **Best Tracks**
- **Frequently Asked Questions (FAQ)**
- **Public Reference Site**

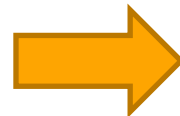
Current Central/Eastern Pacific Tropical Systems:
 • No Current Tropical Cyclone Warnings.
 • include the northern and Arabian Oca

Current Central/Eastern Pacific Tropical Systems:
 • No Current Tropical Cyclone Warnings.

Current Southern Hemisphere Tropical Systems:
 • No Current Tropical Cyclone Warnings.

Current Significant Tropical Weather Advisories:
 • ACPWFO (Western/Eastern Pacific Ocean)
 Issued at 24/0600Z
 - [Public Reference Site](#)
 - [Public Reference Site](#)

JTWC(USA)



IO, 01,	1945042918,	, BEST,	0,	117N,	925E,	-999
IO, 01,	1945043000,	, BEST,	0,	118N,	923E,	-999
IO, 01,	1945043006,	, BEST,	0,	122N,	917E,	-999
IO, 01,	1945043012,	, BEST,	0,	126N,	910E,	-999
IO, 01,	1945043018,	, BEST,	0,	132N,	902E,	-999
IO, 01,	1945050100,	, BEST,	0,	138N,	893E,	-999
IO, 01,	1945050106,	, BEST,	0,	146N,	889E,	-999
IO, 01,	1945050112,	, BEST,	0,	156N,	893E,	-999
IO, 01,	1945050118,	, BEST,	0,	164N,	899E,	-999
IO, 01,	1945050200,	, BEST,	0,	170N,	906E,	-999

JTWC Data Format

1945~
 Total 5018

	Disaster Information	Weather Information	Geological Information
Viet Nam	National Unit Local Unit	NCDC Data – Daily Rainfall – Daily Average Wind Data – Daily Maximum Wind Data – Weather Circumstance	Global Mapping Data – National Boundary – District Boundary – Rivers – Main Roads
Laos PDR	National Unit		
Philippines	National Unit		
Thailand	National Unit		
Hong Kong	Local Unit		
Korea	Local Unit	Metrological Agency	Detailed GIS MAP

Disaster Information for National Unit : EM-DAT,(1990-2008), <http://www.emdat.be>

Disaster Information for Local Unit : Viet Nam (1990-2008)

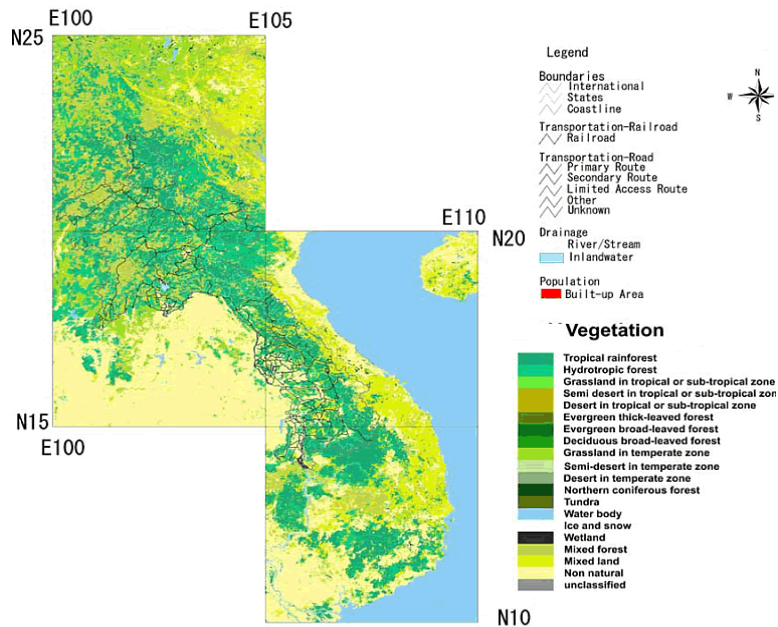
Disaster Information for Local Unit : 홍콩(1968-2007)

Weather Information : 1143 Points, <http://www.ncdc.noaa.gov>

Geological Information : <http://www.iscgm.org>

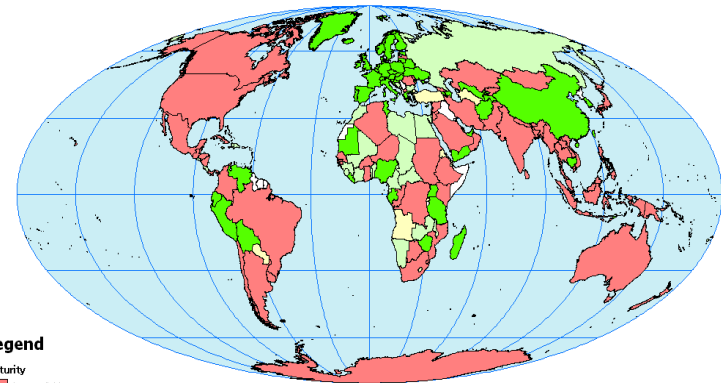
Republic of Korea : 1991-2007

- Transform of Global Map from UN Geographic Information Working Group (UNGIWG)
- Vector Map Scale: 1:1,000,000



Progress of Global Mapping Project

As of 2008-09-16
International Steering Committee for Global Mapping



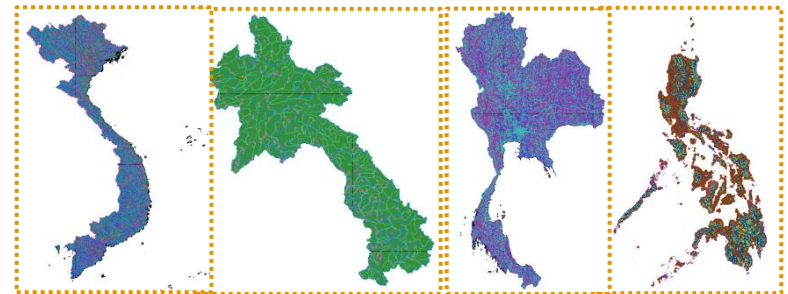
Most elevation data of current Global Map are compiled from GTOPO30, contribution of United States of America.

This map is for the purpose of reference and the boundaries in this map are not authorized by any organizations.

Integrated Typhoon Information System

Example (Global Map)

Vietnam, Lao, Thailand, Philippine



Information

Meteorology

- Rainfall Rate
- Max Wind
- Mean Wind
- Weather Station
- Typhoon

Damage

- Loss of Money
- Photo

GIS

- Map
- Weather Station
- Damaged Location

Questionnaire Example for Philippine

< Questionnaire of digital map in Philippine >

- (1) 1: 50000 topographic map----(yes, no)---
digital format (shp, tiff or Jpg else) published map (Hilton will)
- (2) 1: 25000 topographic map----(yes, no)---
digital format (shp, tiff or else)
- (3) 1: 5000 topographic map for urban areas and 1: 25000
for rural areas----- (yes, no)
- (4) digital elevation data----(yes, no)---
resolution in meters: 30 meter
- (5) land use map--- (yes, no)----- MMDA
how many classes are divided into?
- (6) national boundary, administration boundary? (yes, no)
- (7) main highway and street map? (yes, no)

	2008	2007	2006	2005	2004	2003~ 2000	Before 1999	Total
Vietnam	94	55	109	58	5	8	8	337
Philippines	66	21	155	1	44	40	32	359
Thailand	0	0	14	2	0	3	5	24
Laos	6	1	4	0	0	2	0	13
Hongkong	28	2	14	0	0	5	33	82
Guam	0	1	0	0	0	21	10	32
Total	194	80	296	61	49	79	88	847

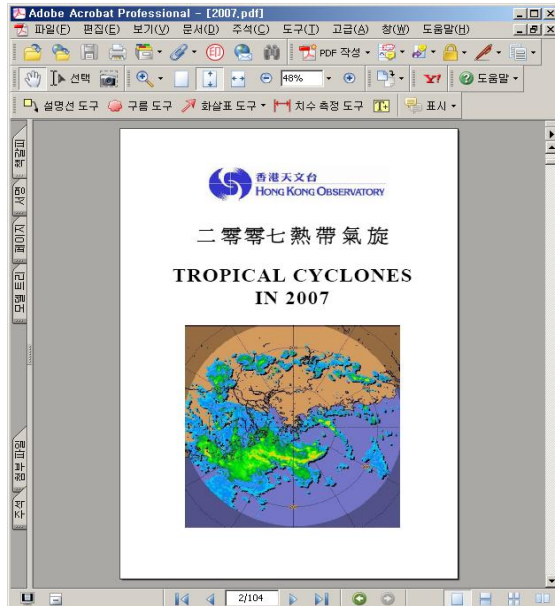
Total Observed Data

National	Local	Typhoon	Date	Site	Contents
Viet Nam	Thua Thien Hue	Xangsane	2006 .10.2	http://www.dwf.org/blog/project...	ECHO Xangsane Reconstruction
Viet Nam	Quang Binh	Lekima	2007 .10.4	http://www.cb.c.ca/world/story/2007/10/03/typhoon...	Typhoon batters one of Vietnam's poorest regions
Viet Nam	SON LA	Hagupit	2008 .9.29	http://english.vietnamnet.vn...	Floods claim 41 deaths in northern region



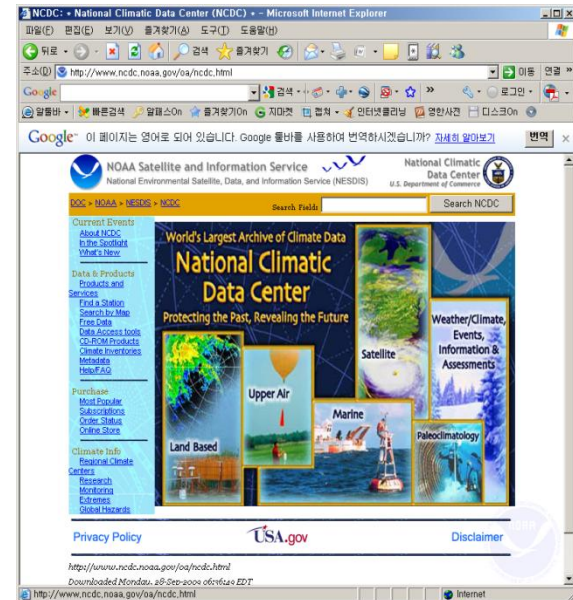
Obtained 730 Disasters Information from 14 TC Members

Disaster Information
Hong Kong Observatory
(www.weather.gov.hk)



1968~Now, PDF

Weather Information
NOAA
(<ftp.nce.noaa.gov>)



1973~Now, TXT

PHILIPPINES WEATHER TYPHOON HALONG

Photo made available 19 May 2008 shows residents looking at the remains of a Filipino victim pinned under a fallen tree following a typhoon that hit Pangasinan province, north of Manila, Philippines 18 May 2008. Twelve people were killed and more than 34,000 displaced after Typhoon Halong hit the Philippines, according to the government's Civil Defence Office. EPA/STR

news.naver.com

images.google.co.kr

www.imageforum-diffusion.afp.com

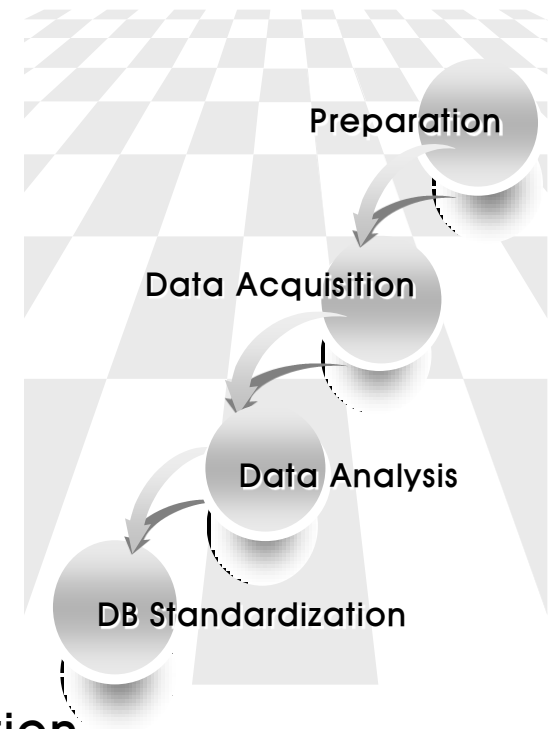
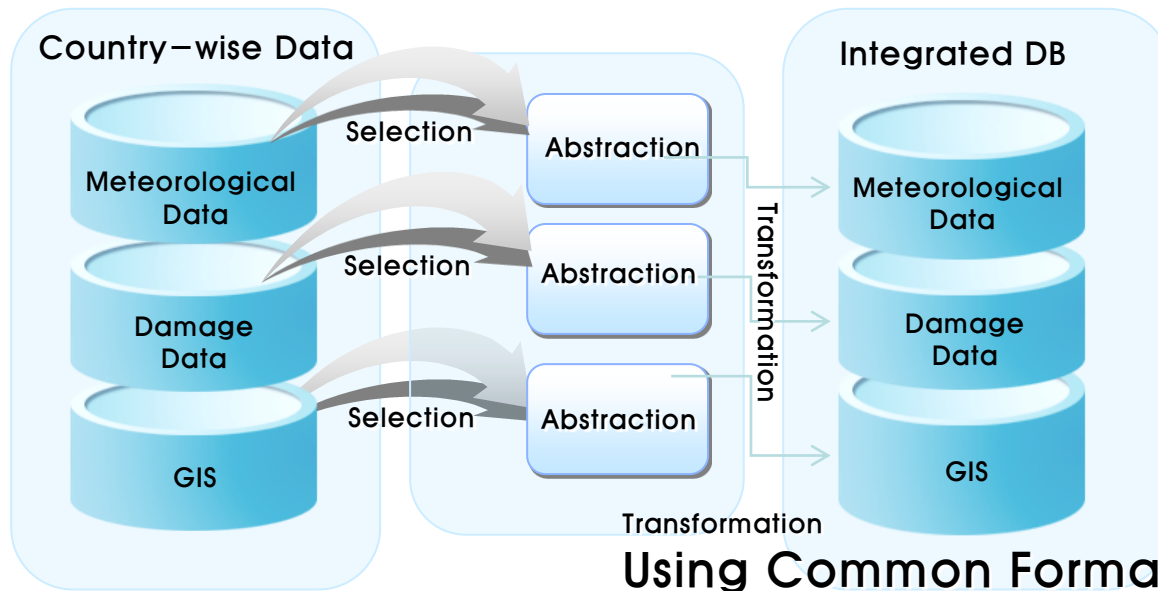
www.daylife.com

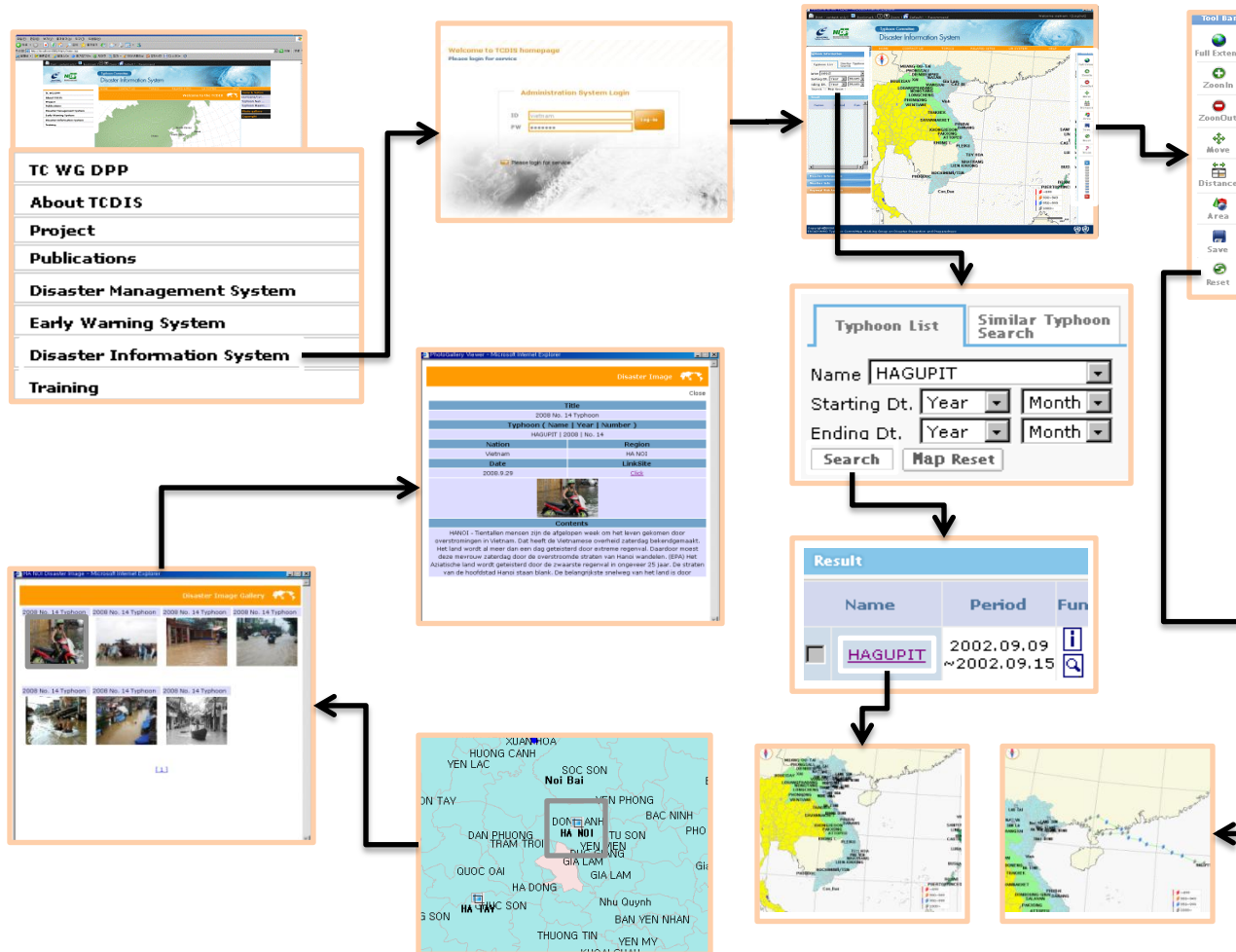
www.flickr.com

disaster code	19910101 (the date for a specific meteorological phenomena, the same to the weather information)
province	area surrounded by the first level of administration boundaries
county	area surrounded by the second level of administration boundaries
amount of damage	dollar in 2005 trans—calculated from domestic money rate
victim	the number of the dead and missing
human	the number of the wounded
flooded area	areas of flooded, m2 or the names of areas affected
house	the number of demolished (partly or wholly)
ship	the number of broken ship
farmland	the damage of agricultural lands
river	names of inundated river
transportation	missing or broken lines, meter
other public	building or other social damage
private damage	estimated



Selection, Abstraction and Transformation





TYPHOON_CODE 생성일 : 2009-04-28 오전 10:48:04 최종수정일 : 2009-04-28 오전 10:48:04 상태 : VALID

PK	컬럼	데이터 타입	기본값	널여부	주석
1	SEQ_ID	NUMBER		N	
2	TYPHOON_ID	NUMBER		N	
3	RECOR_COUNT	NUMBER		Y	
4	TYPHOON_NAME	VARCHAR2(50)		Y	

TYPHOON_DAMAGE 생성일 : 2009-04-28 오전 10:48:04 최종수정일 : 2009-04-28 오전 10:48:04 상태 : VALID

PK	컬럼	데이터 타입	기본값	널여부	주석
1	SEQ_ID	NUMBER		N	
2	DAMAGE_CD	VARCHAR2(12)		N	
3	START_DATE	VARCHAR2(8)		Y	
4	END_DATE	VARCHAR2(8)		Y	
5	DAMAGE_NAME	VARCHAR2(20)		Y	
6	TYPHOON_ID	NUMBER		Y	
7	TYPHOON_NAME	VARCHAR2(50)		Y	
8	DAMAGE_CODE	NUMBER		Y	
9	DAMAGE_TERM	NUMBER		Y	

TYPHOON_DAMAGE_IMAGE 생성일 : 2009-06-03 오후 8:27:17 최종수정일 : 2009-06-03 오후 9:58:51 상태 : VALID

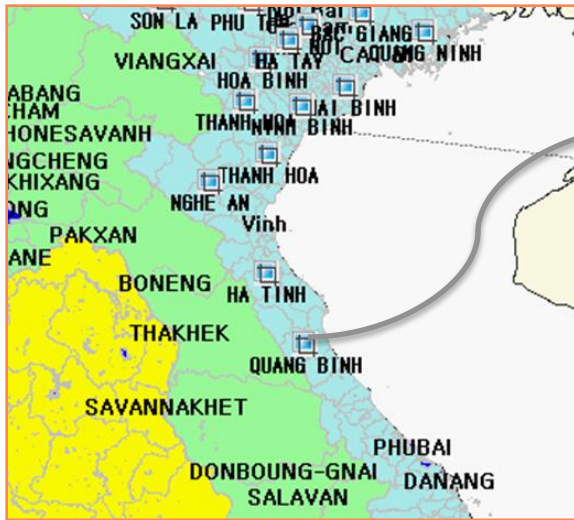
PK	컬럼	데이터 타입	기본값	널여부	주석
1	SEQ_ID	NUMBER		Y	
2	NATION_NAME	VARCHAR2(20)		Y	
3	AREA	VARCHAR2(20)		Y	
4	TYPHOON_ID	NUMBER		Y	
5	YYYYMMDD	VARCHAR2(20)		Y	
6	IMAGE_NAME	VARCHAR2(50)		Y	
7	LINK_TYPE	NUMBER		Y	
8	LINK_SITE	VARCHAR2(300)		Y	
9	CONTENT	VARCHAR2(500)		Y	
10	AREA_CODE	NUMBER(4)		N	

DAMAGE_PREDICTION_VIETNAM 생성일 : 2009-04-28 오전 10:48:01 최종수정일 : 2009-04-28 오전 10:48:01 상태 : VALID

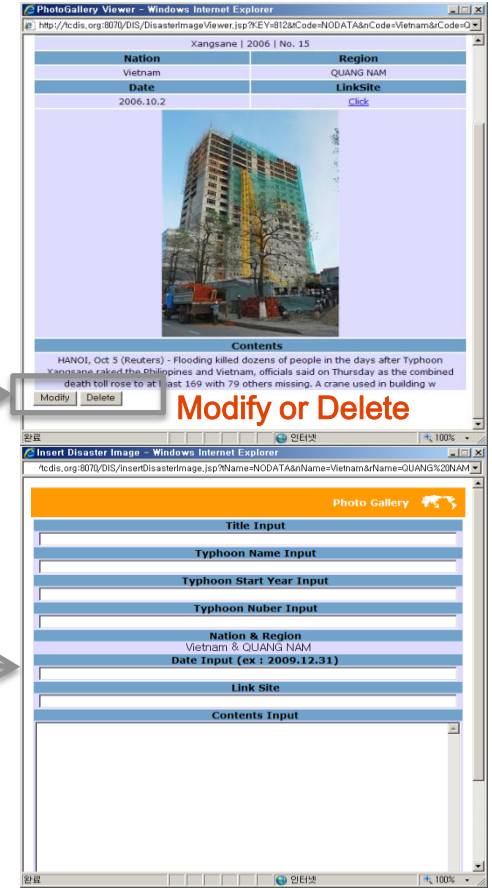
PK	컬럼	데이터 타입	기본값	널여부	주석
1	AREA	VARCHAR2(20)		Y	
2	REGN_CD	NUMBER(5)		Y	
3	LULLULATE_MAXIM	NUMBER		Y	
4	WIND_MAX_SPD	NUMBER		Y	
5	VICTIM_NUM	NUMBER		Y	
6	MAN_DAMAGE_NUM	NUMBER		Y	
7	BUILDING_DAMAGE_AMT	NUMBER		Y	
8	SCHOOL	NUMBER		Y	
9	HOSPITAL	NUMBER		Y	
10	FARM_DAMAGE_AMT	NUMBER		Y	
11	TRANS_DAMAGE_AMT	NUMBER		Y	
12	ALL_DAMAGE_AMT	NUMBER		Y	
13	SEQ_ID	NUMBER		Y	

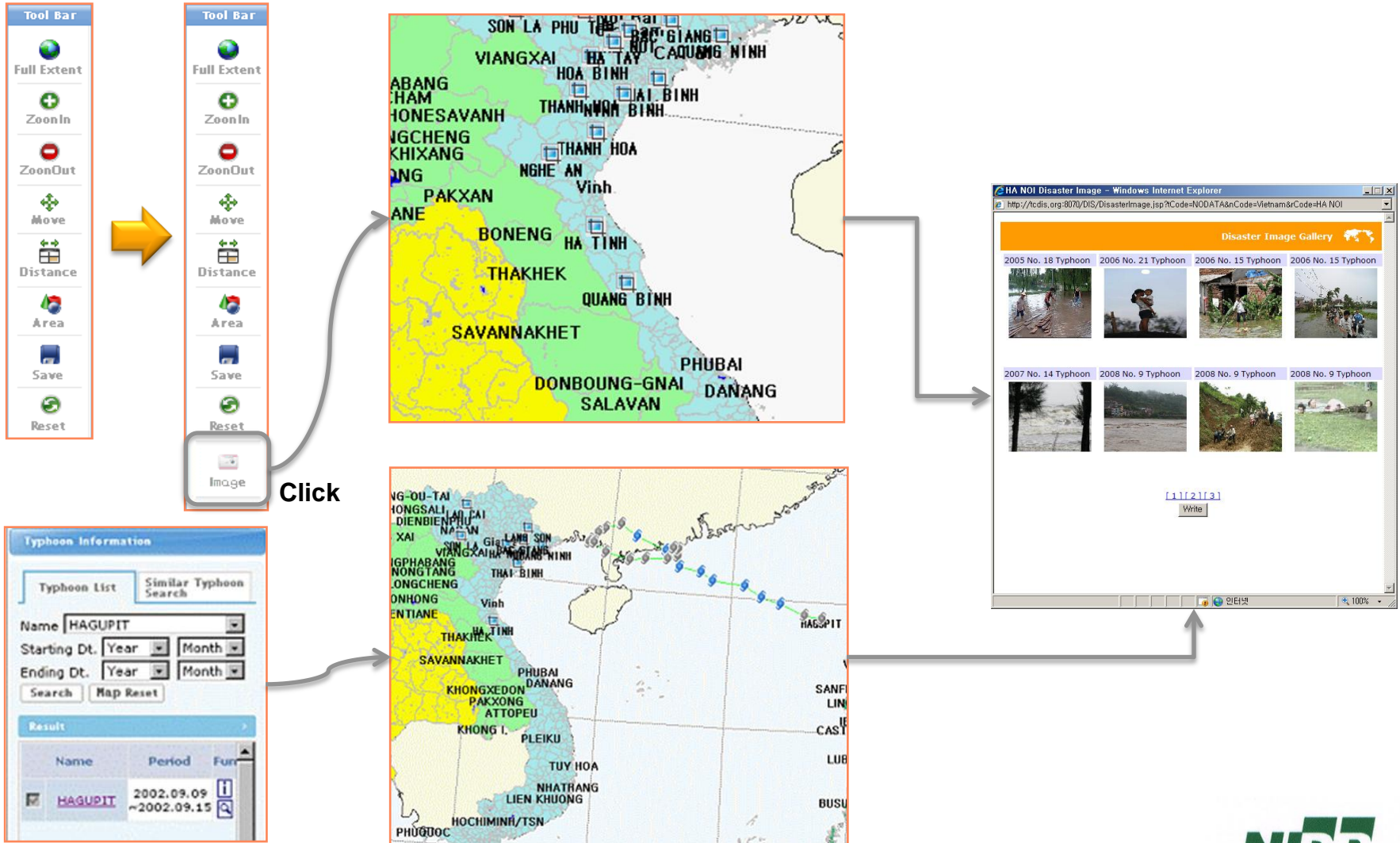


Damage Information



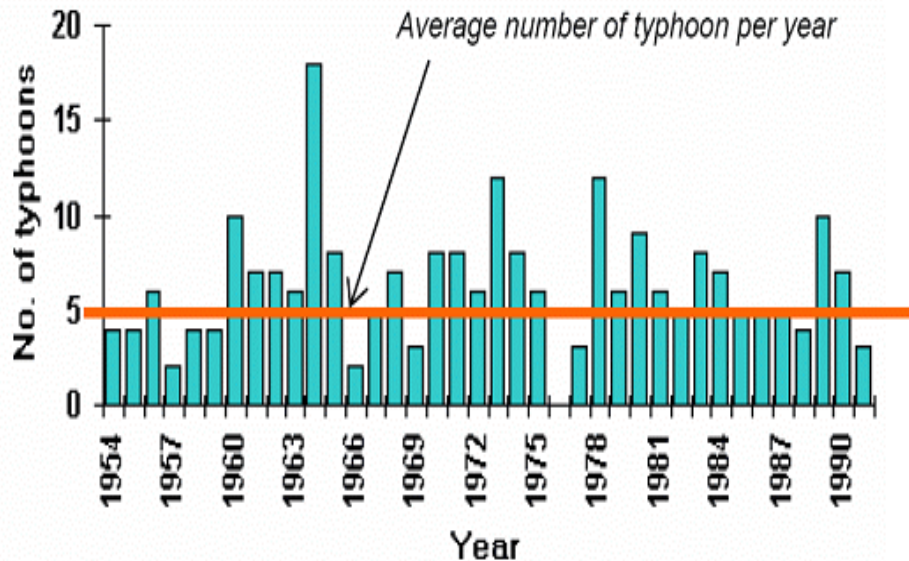
Upload





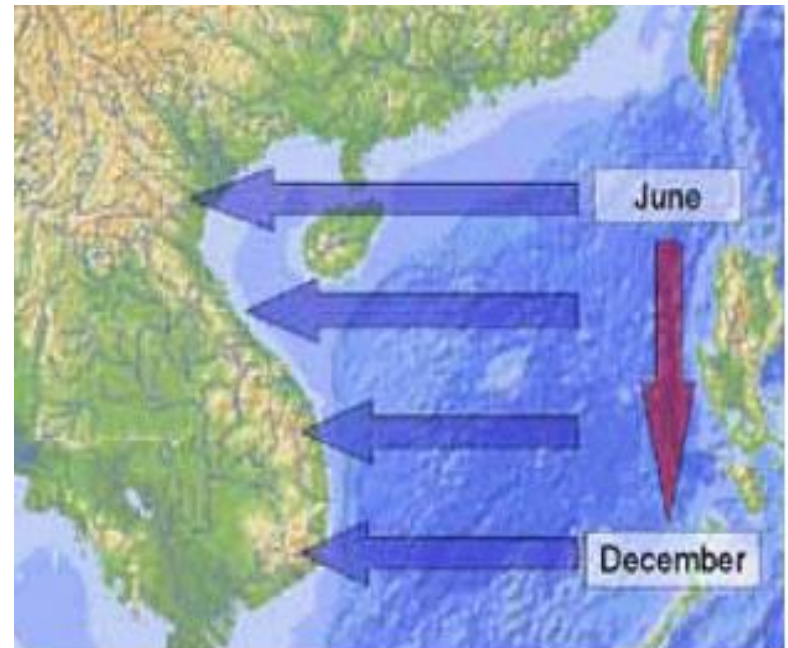
Viet Nam Typhoon Disasters

Duration



Average number of typhoon is 5
Maximum number of typhoon is 18

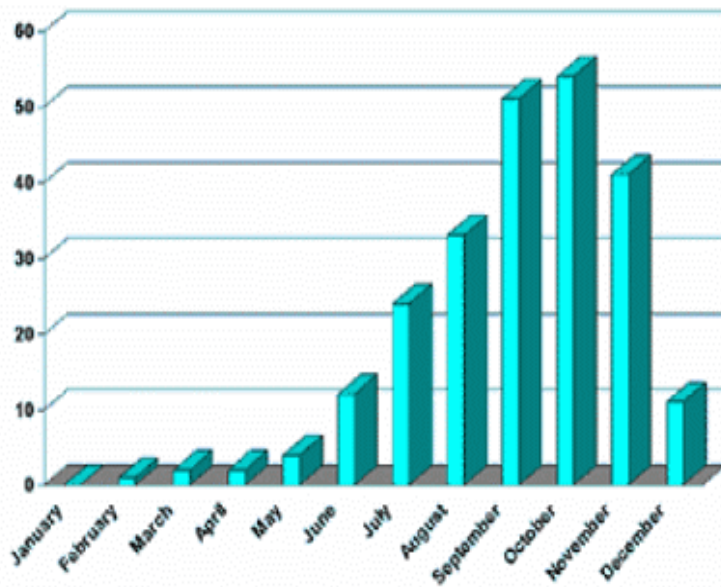
Damage Area



May ~ June: North Area
December: South Area (Weak)

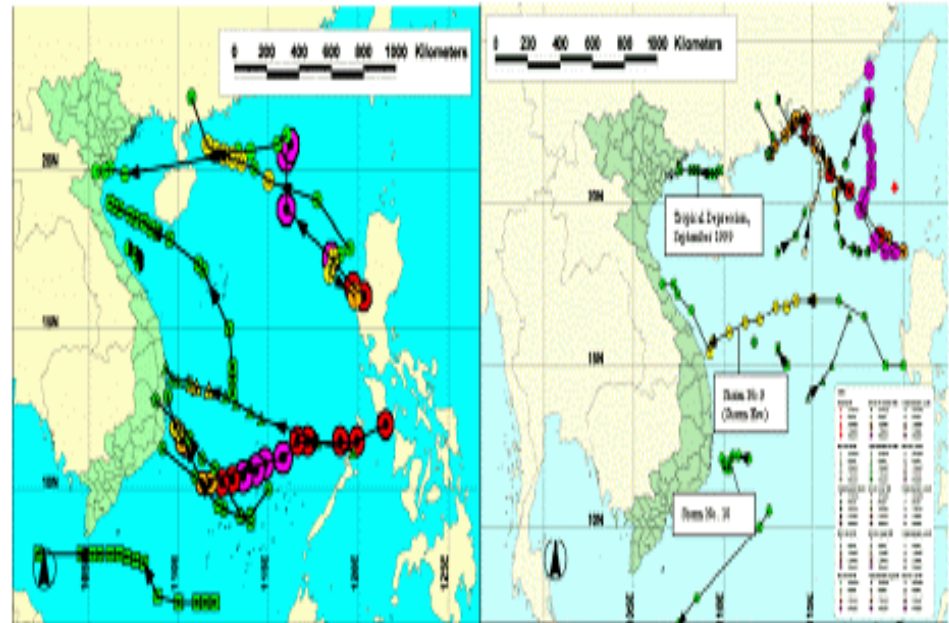
Viet Nam Typhoon Disasters

Monthly Typhoon Disasters



Concentrated on 9~10

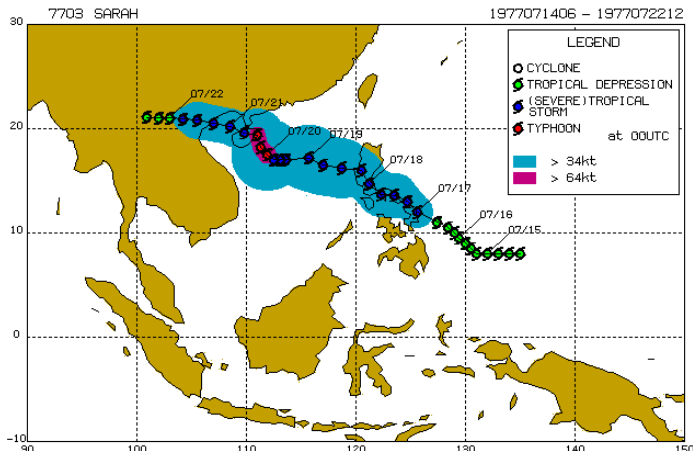
Typhoon Trajectories



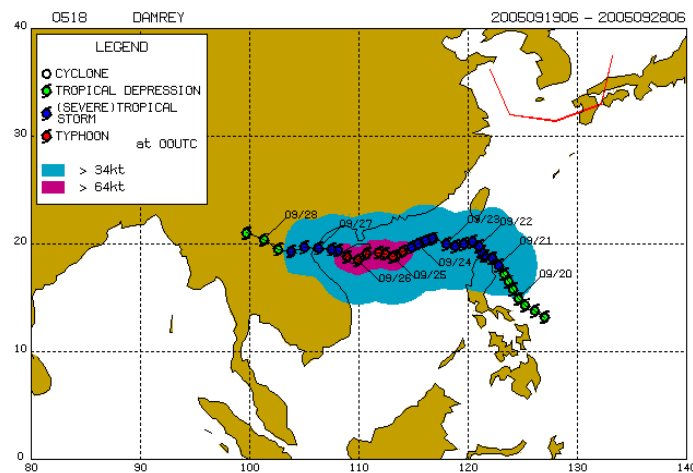
Move from South China Sea to West

Viet Nam Typhoon Disasters

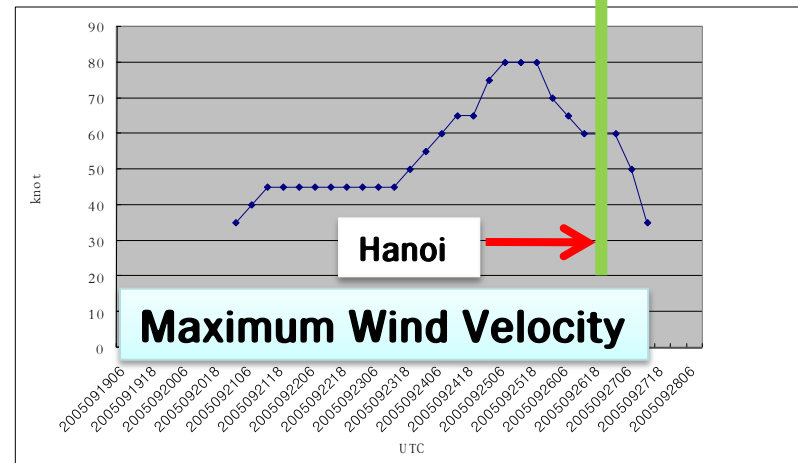
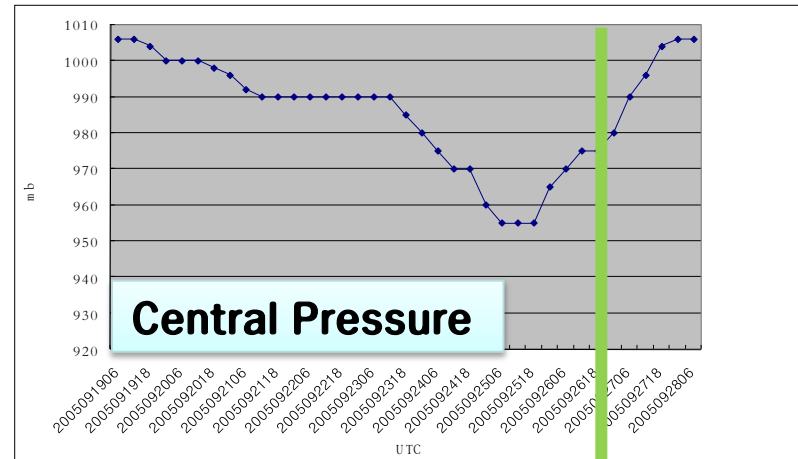
Hanoi



Sarah (1977)



Damrey (2005)



Variables to estimate similar typhoon trajectory

Pressure Distribution

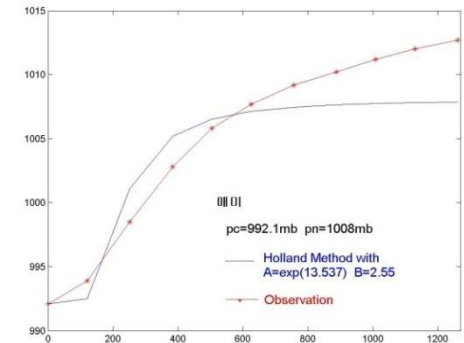
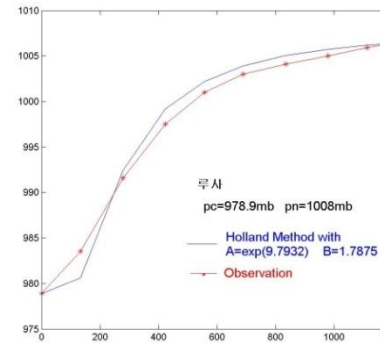
Atmospheric Pressure

Central Pressure

Length from Center

$$p = p_c + (p_n - p_c) \exp\left(-\frac{A}{r^B}\right)$$

Constant



A=B=1 (Maemi & Rusa)

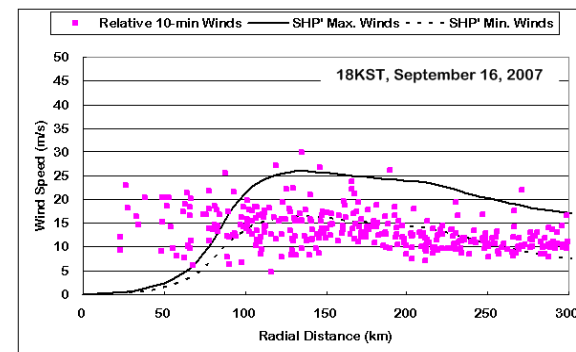
Wind Speed Distribution

Length from Center

Corioles Constant

$$V_g(r) = -\frac{rf}{2} + \left[\frac{r}{\rho} \frac{dp}{dr} + \left(\frac{rf}{2}\right)^2 \right]^{1/2}$$

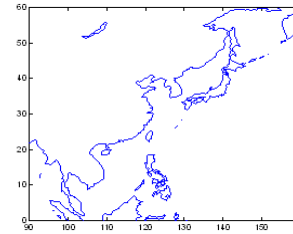
Atmospheric Density



Wind Speed Distribution of Nari

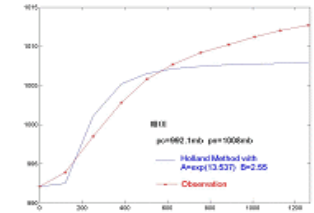
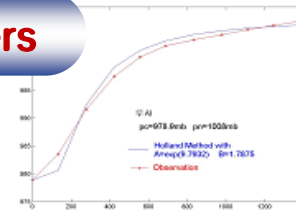
Extend Boundary Condition

Latitude 0~60°
Longitude 90~160°



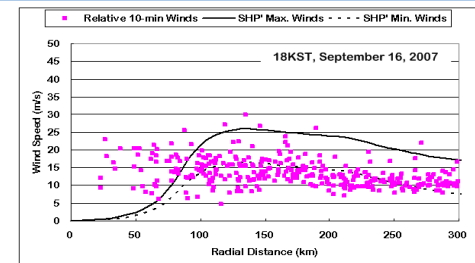
Add Pressure Distribution Parameters

$$p = p_c + (p_n - p_c) \exp\left(-\frac{A}{r^B}\right)$$

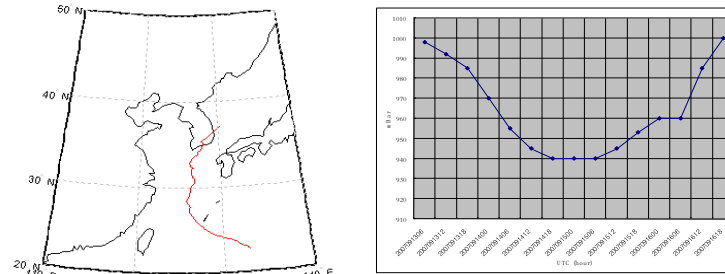


Add Wind Speed Distribution Parameters

$$V_g(r) = -\frac{rf}{2} + \left[\frac{r}{\rho} \frac{dp}{dr} + \left(\frac{rf}{2} \right)^2 \right]^{1/2}$$



Trajectory of Typhoon (Korea)



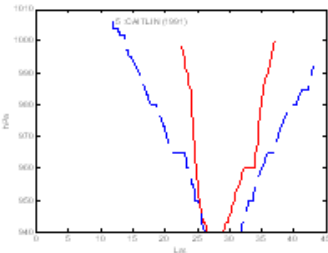
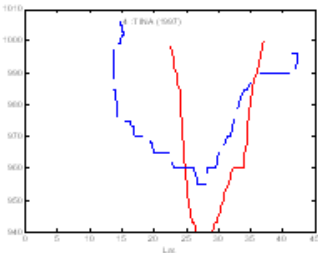
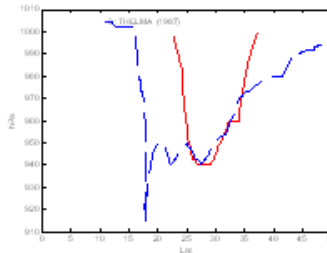
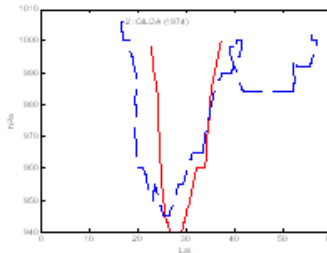
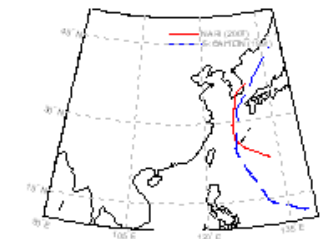
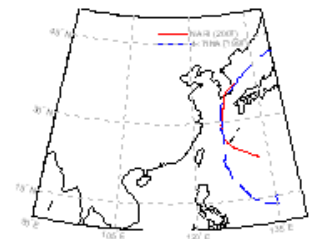
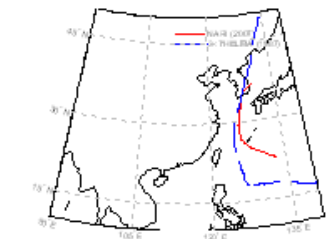
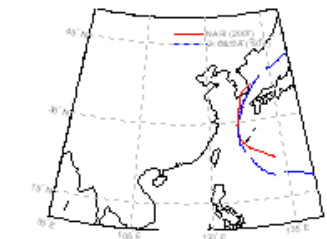
Typhoon NARI

1st: GILDA(1974), old: 4th

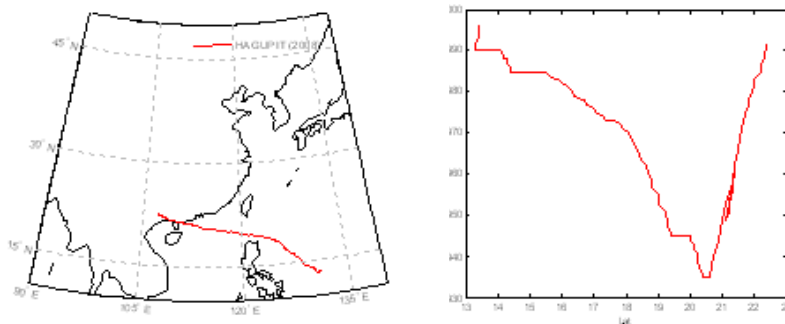
2nd : THELMA(1987), old: 3rd

3rd : TINA(1997), old: 1st

4th : CAITLIN(1991)

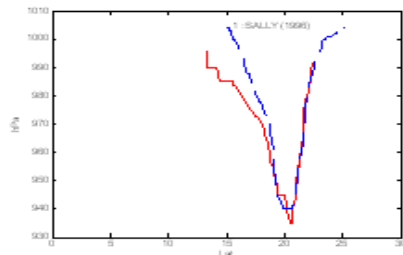
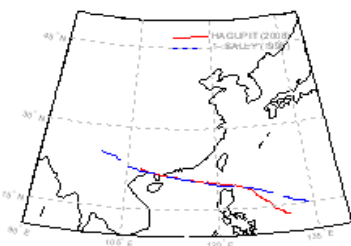


Trajectory of Typhoon (Viet Nam)

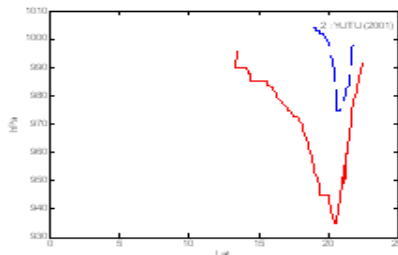


HAGUPI (2008)

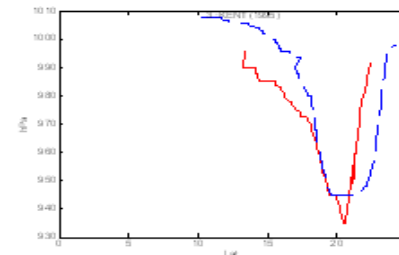
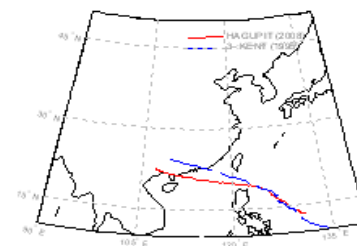
1st : HAGUPIT & SALLY(1996)



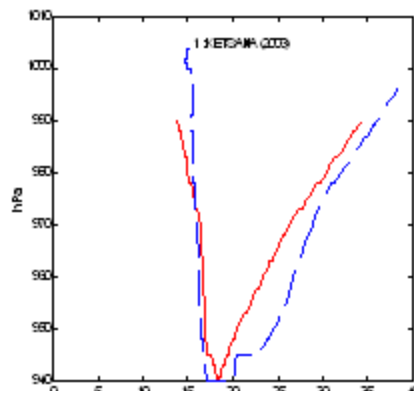
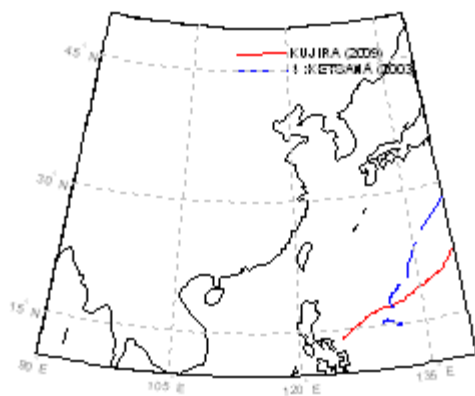
2nd : HAGUPIT & YUTU(2001)



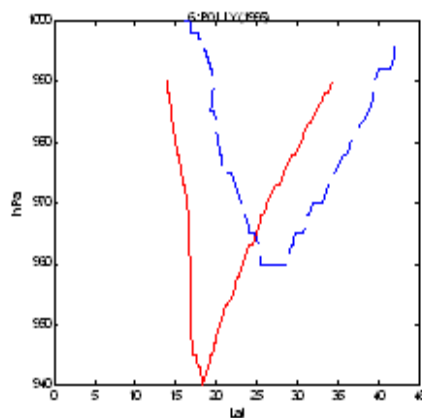
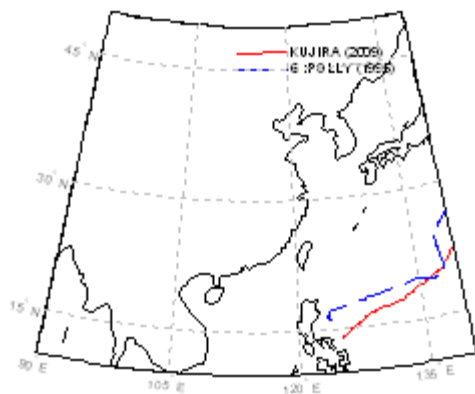
3rd : HAGUPIT & KENT(1995)



Comparisons with KUJIRA(2009)

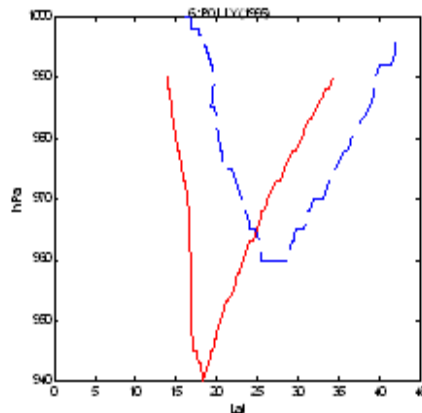
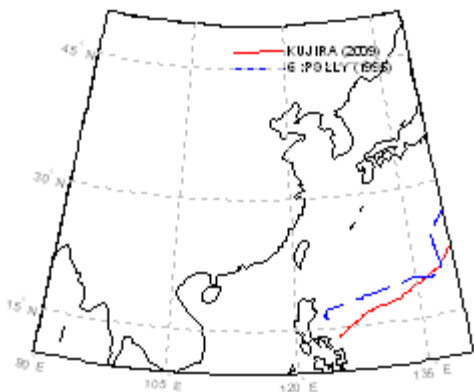


1st level : KETSANA(2003)
Mismatch on Trajectory



5th level : POLLY(1995)
Mismatch on Pressure

Comparisons Between POLLY and KUJIRA



Pressure : POLLY > KUJIRA

SST : POLLY > KUJIRA

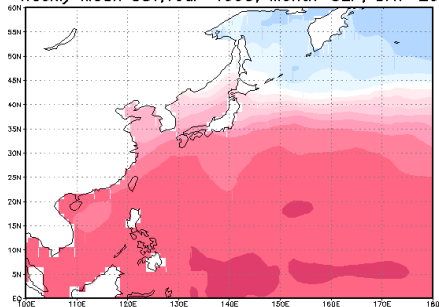
POLLY (1995) : EM-DAT

Death : 430, Surfers : 44,000
Damages : 700 M USD

KUJIRA (2009) : News

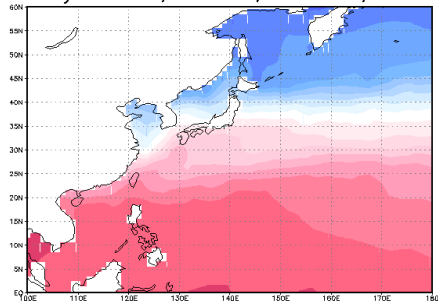
Death : 20

Weekly Mean SST, Year=1995, Month=SEP, DAY=20

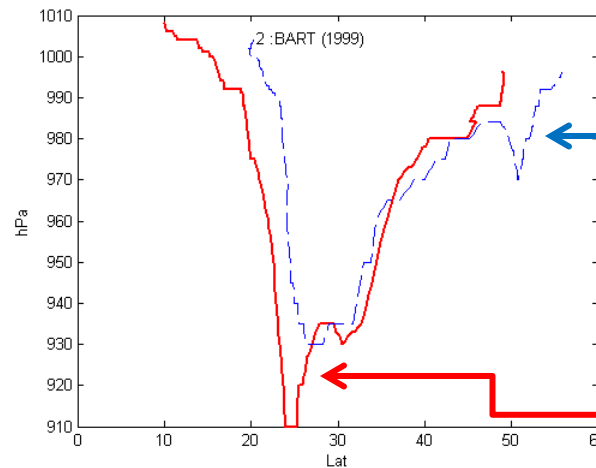
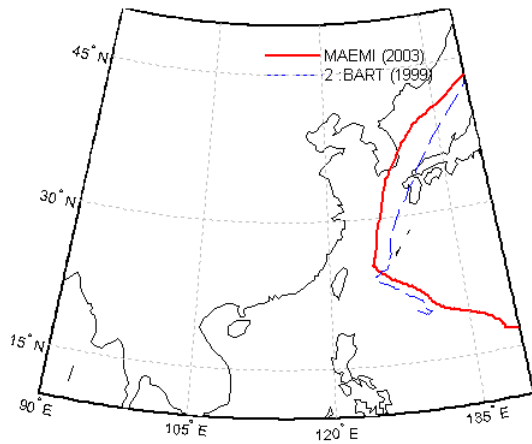


POLLY

Weekly Mean SST, Year=2009, Month=APR, DAY=22



KUJIRA

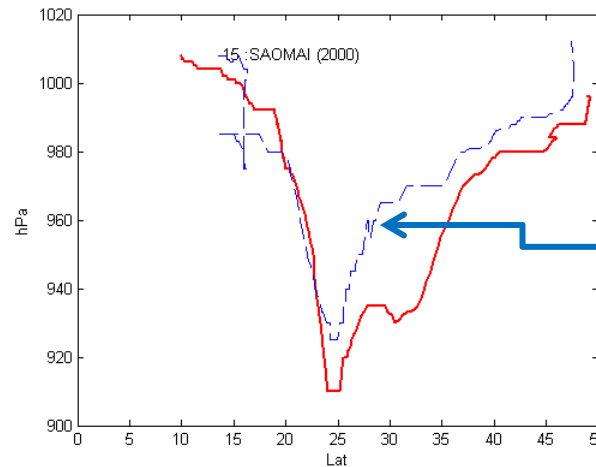
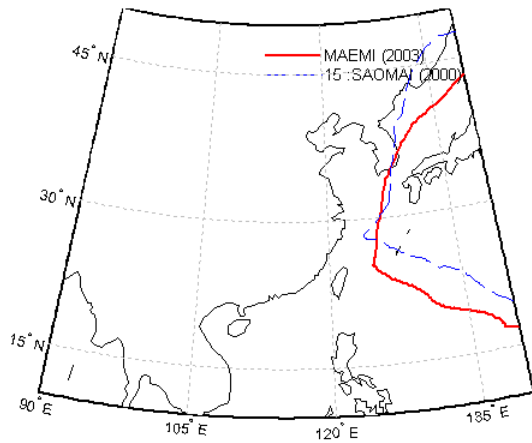


1999 BART

Rainfall : 271mm
Pre-Rainfall : 32.5mm
Max. Wind : 16.7m/s
Damages : 102M USD

2003 MAEMI

Rainfall : 197mm
Pre-Rainfall : 49mm
Max. Wind : 39.5m/s
Damages : 450B USD

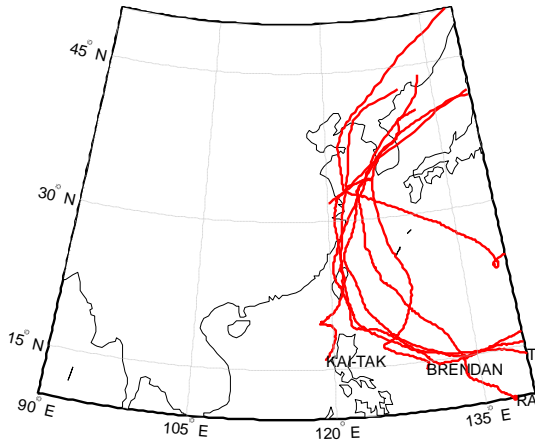


2000 SAOMAI

Rainfall : 285mm
Pre-Rainfall : 97mm
Max. Wind : 18.7m/s
Damages : 15.6M USD

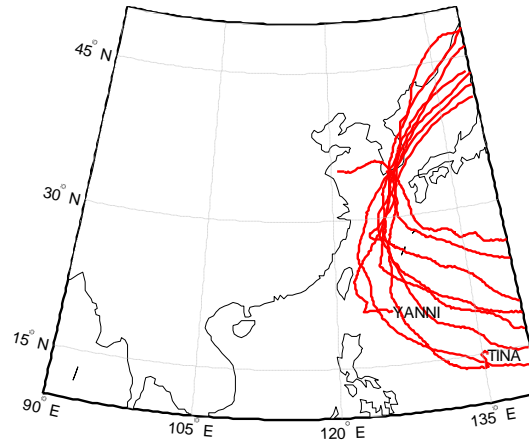
Typhoons during 1991–2005 (25)

West Sea (9)



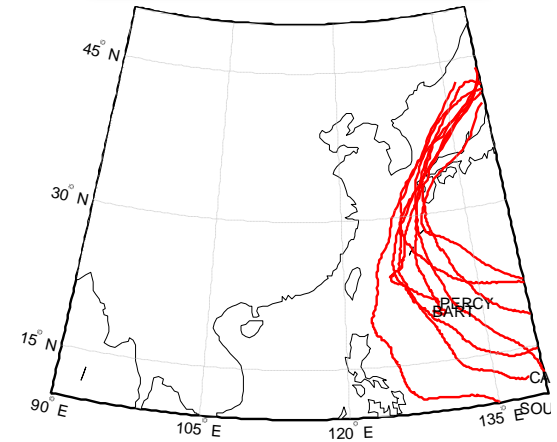
TED (9219)
BRENDAN (9411)
DOUG (9413)
ELLIE(9414)
KAITAK(0004)
RAMMASUN (0205)
MINDULLE (0407)

South Sea (9)

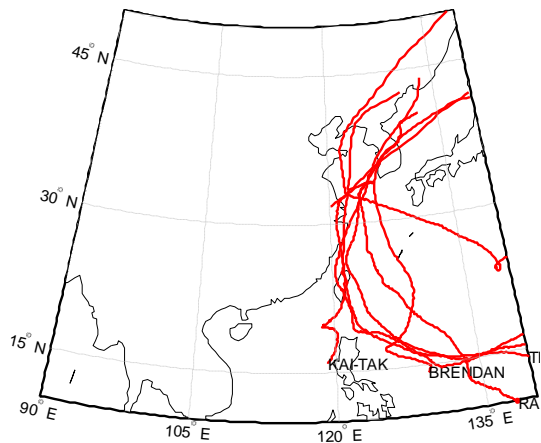


GLADYS (9112)
SETH (9429)
FAYE (9503)
TINA (9711)
YANNI (9809)
SAOMAI (0014)
RUSA (0215)
MAEMI (0314)
MEGI (0415)

South–East Sea (7)

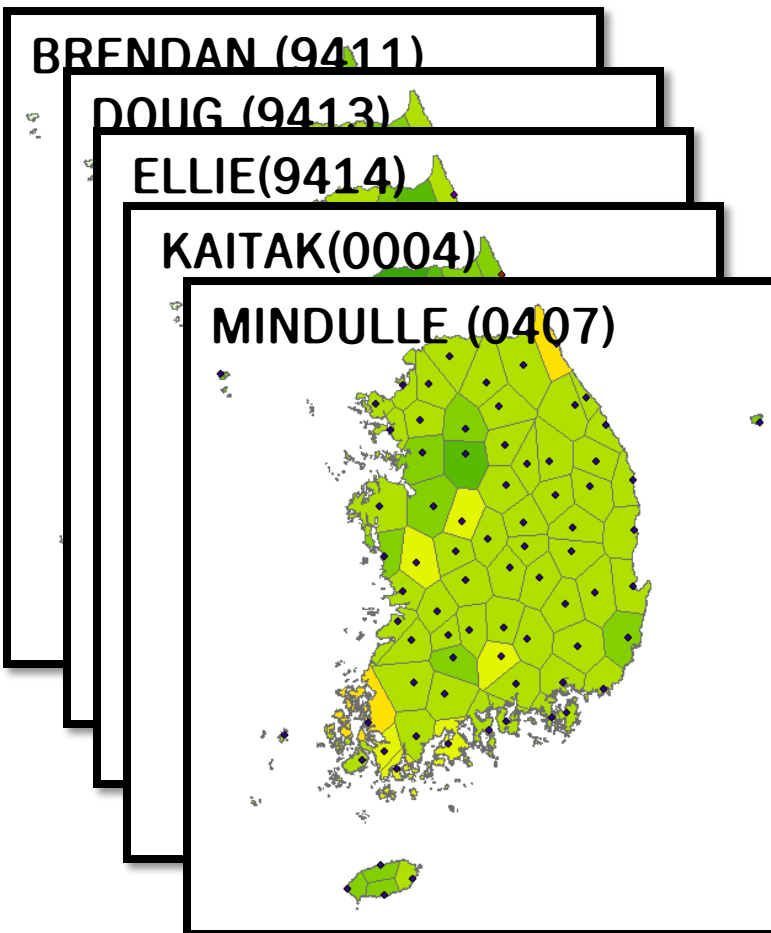


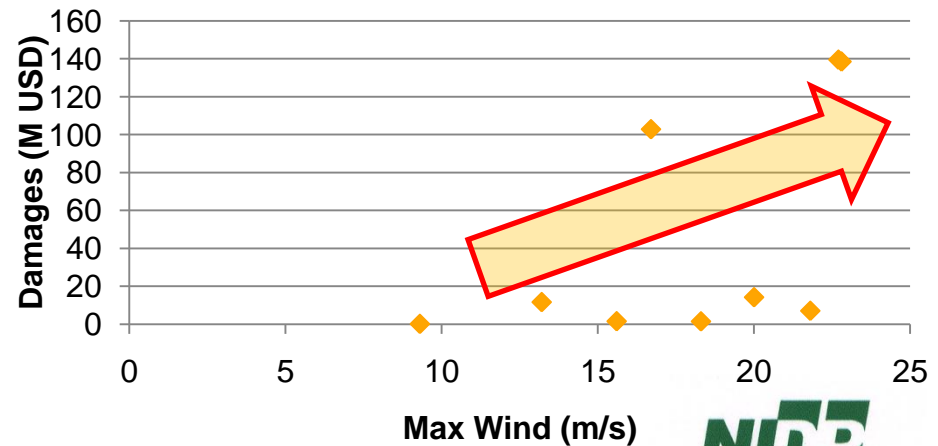
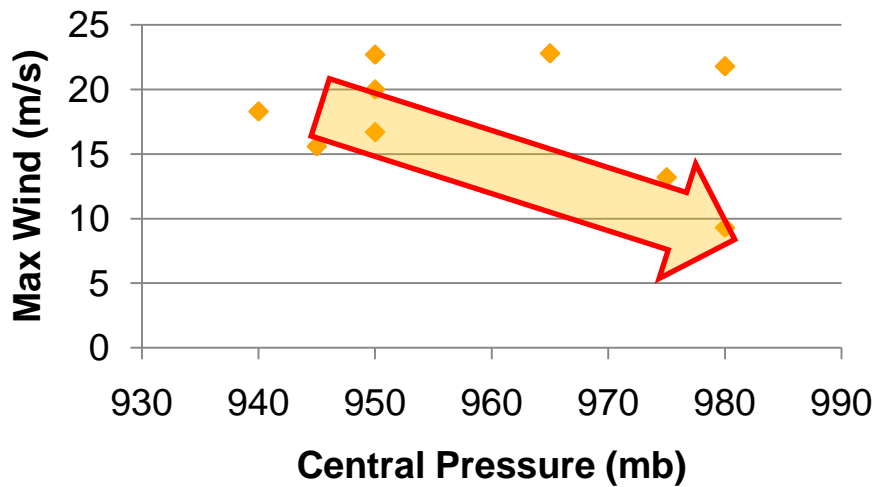
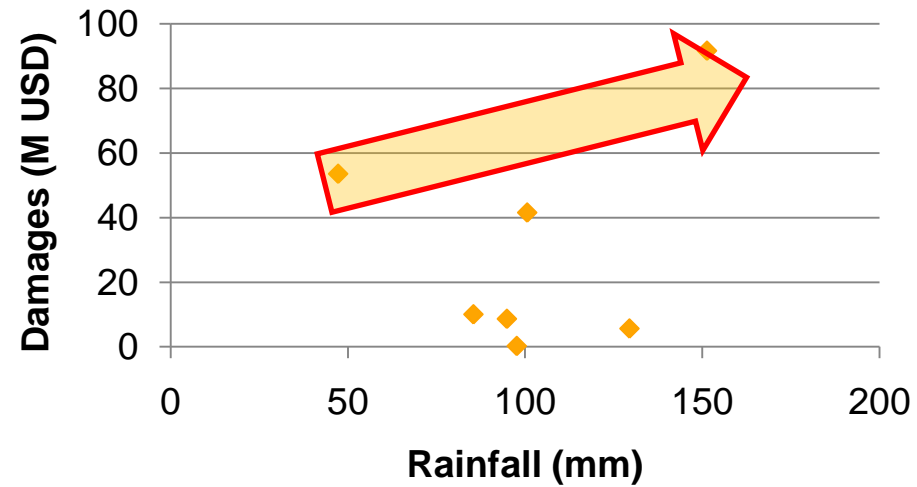
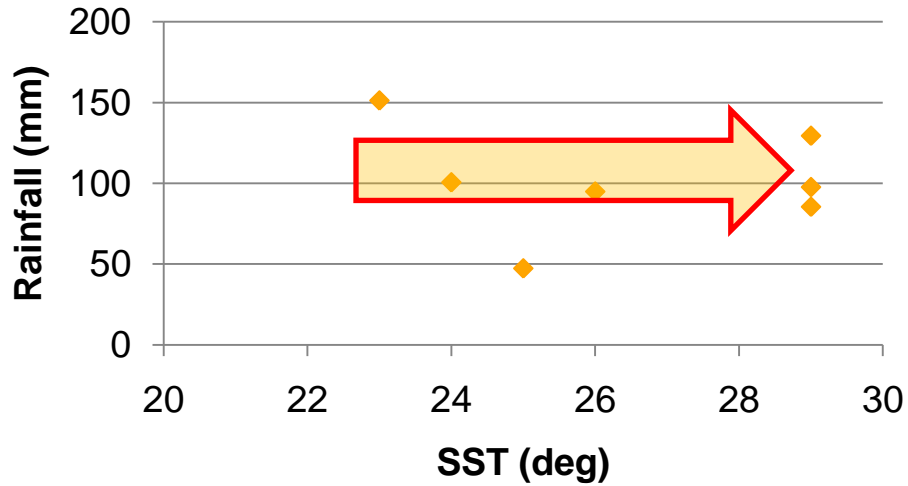
CAITLIN (9109)
MIREILLE (9119)
PERCY (9306)
ROBYN (9307)
OLIWA (9719)
BART (9918)
SOUDELOR (0306)
SONGDA (0418)
NABI (0514)

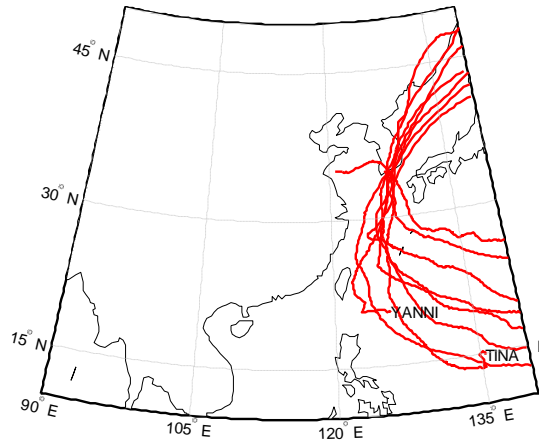


TED (9219)
BRENDAN (9411)
DOUG (9413)
ELLIE(9414)
KAITAK(0004)
RAMMASUN (0205)
MINDULLE (0407)

Rainfall : 47~151 1000M ton

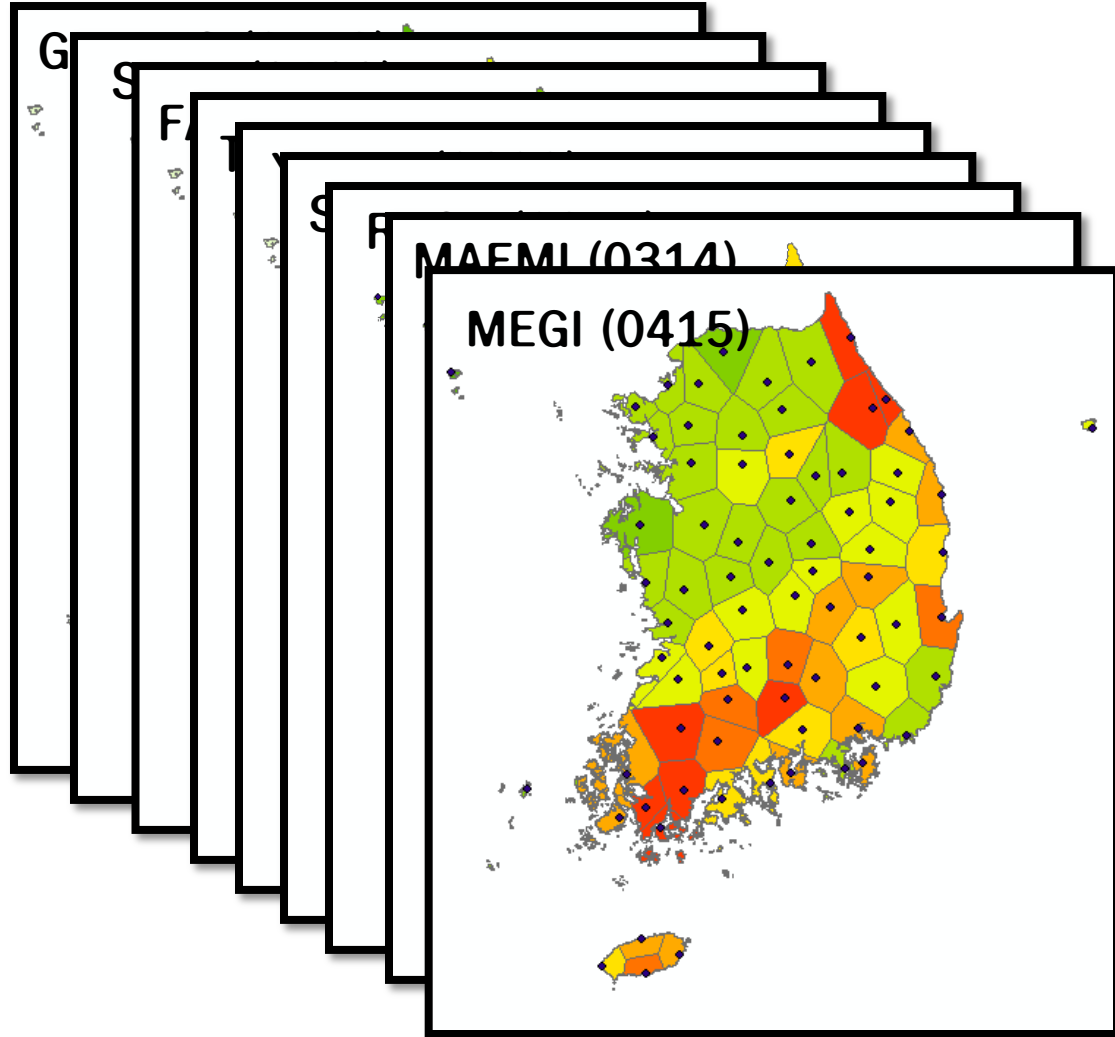


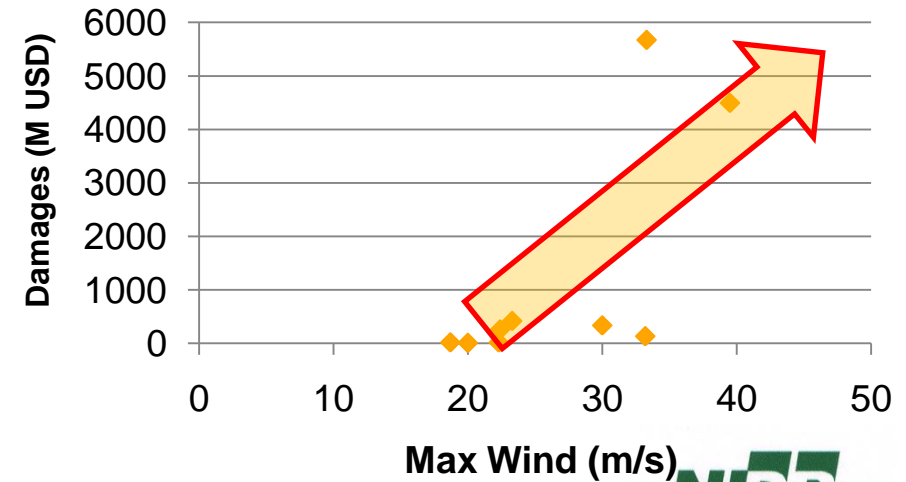
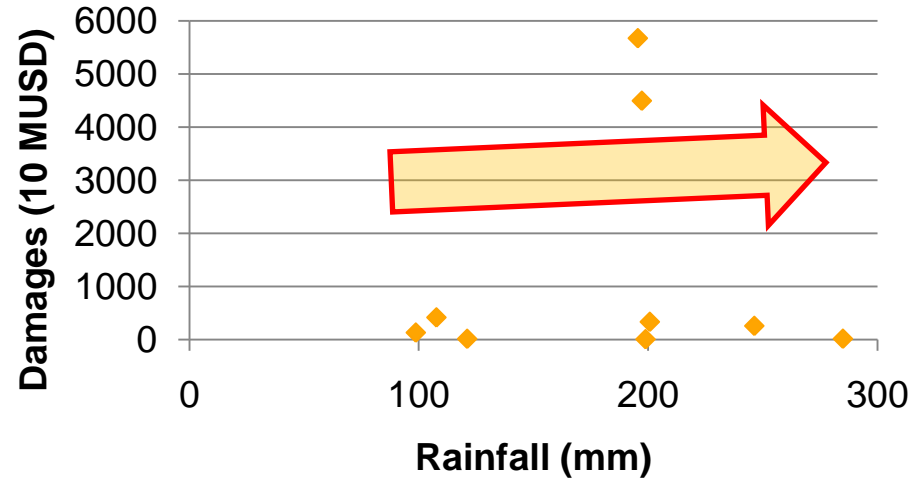
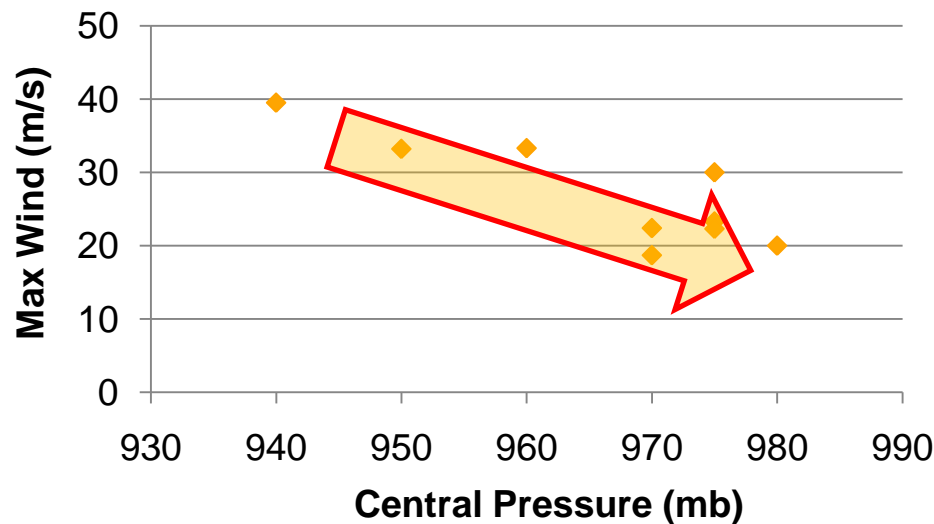
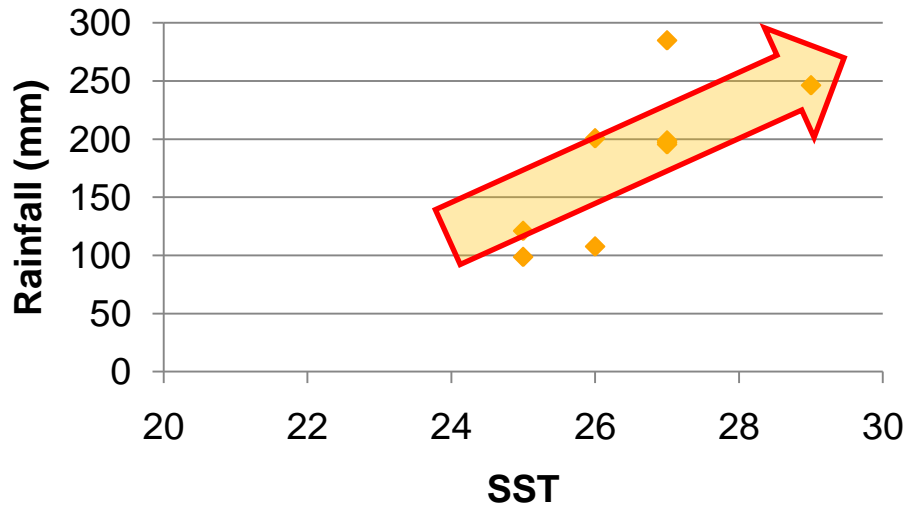


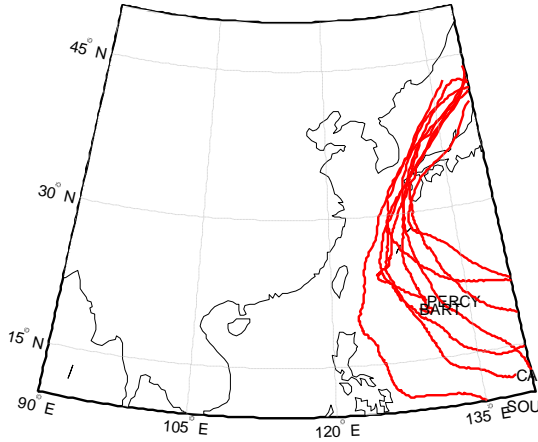


GLADYS (9112)
SETH (9429)
FAYE (9503)
TINA (9711)
YANNI (9809)
SAOMAI (0014)
RUSA (0215)
MAEMI (0314)
MEGI (0415)

Rainfall : 100–300 1000M ton

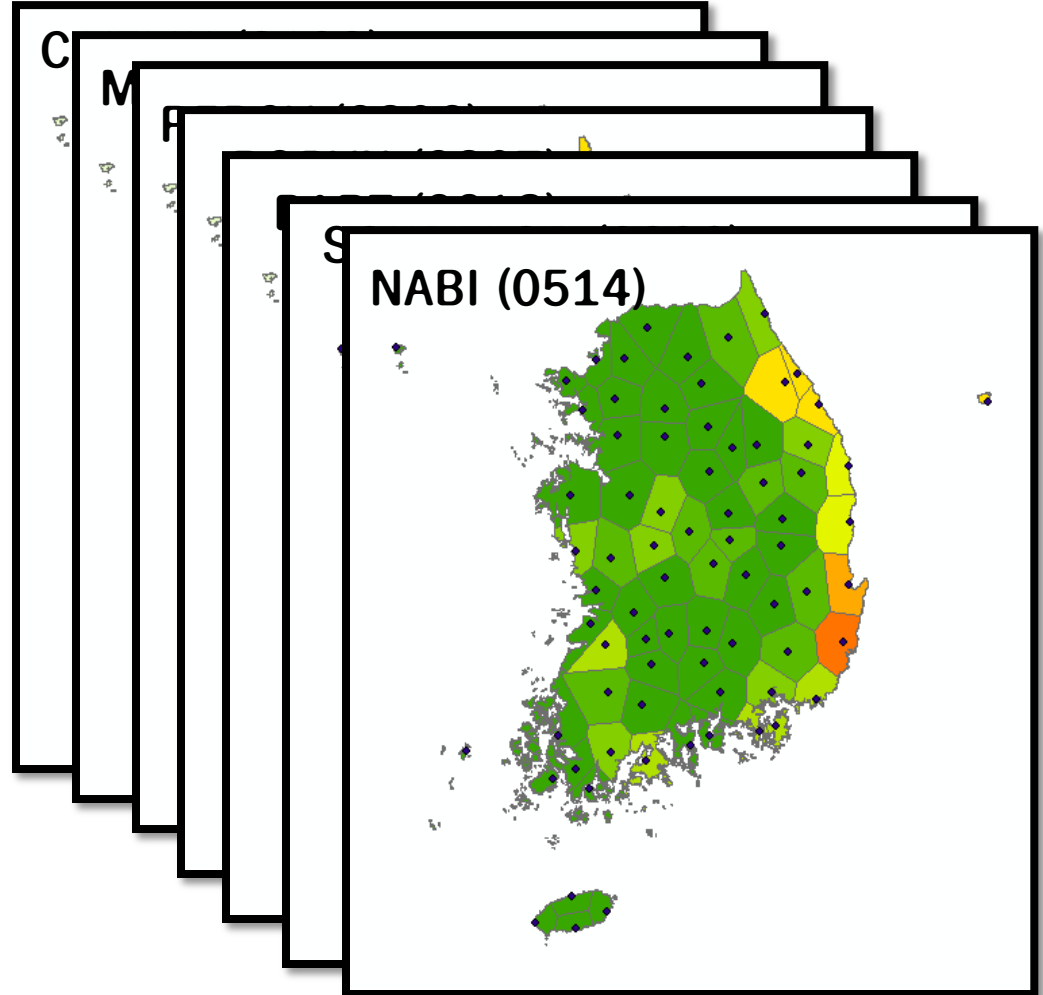


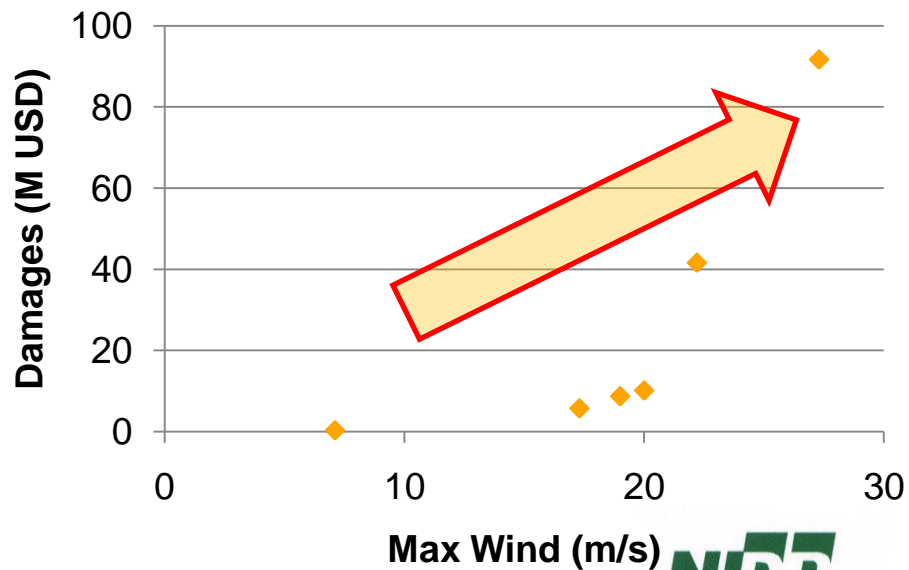
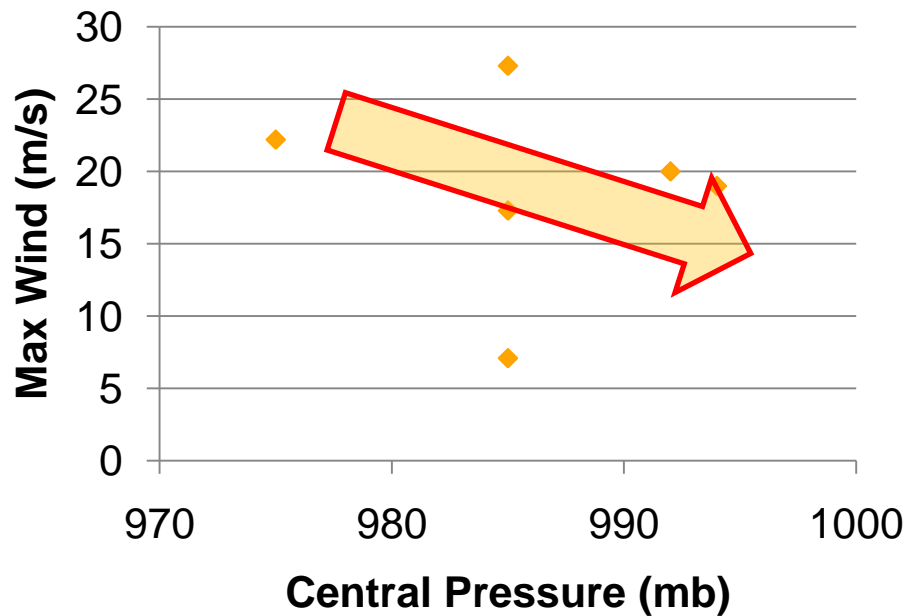
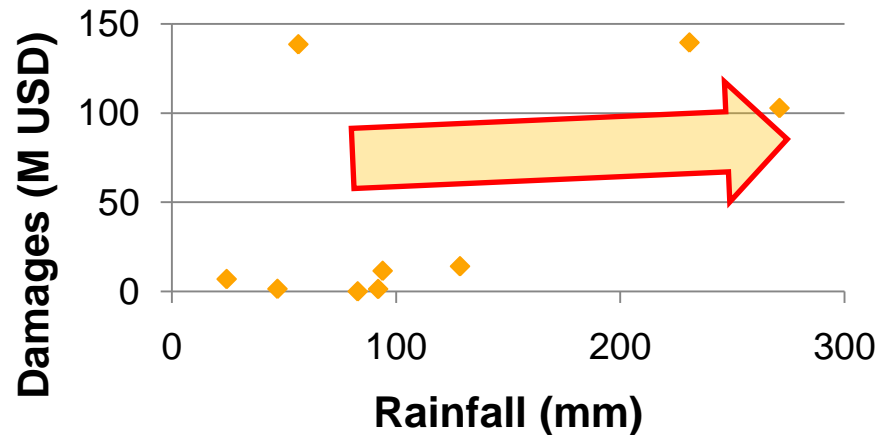
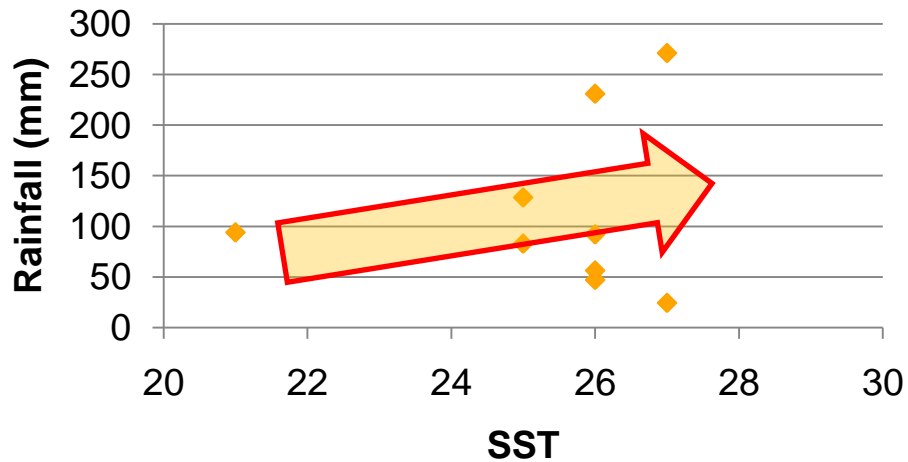




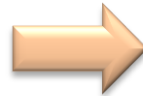
CAITLIN (9109)
MIREILLE (9119)
PERCY (9306)
ROBYN (9307)
OLIWA (9719)
BART (9918)
SOUDELOR (0306)
SONGDA (0418)
NABI (0514)

누적 강수량 분포 : 30-270 1000Mton





OLD Version



NEW Version

NNM (Nearest Neighbor Method)

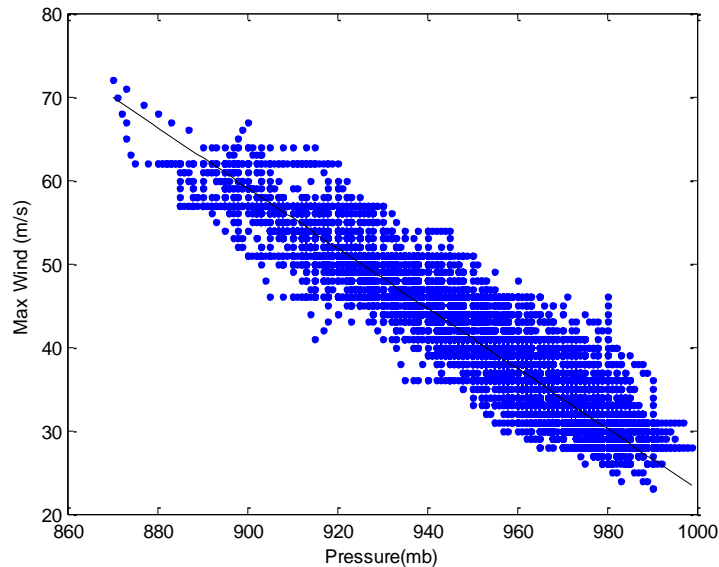
- Compare with trajectory and central pressure
- Select similar typhoon by minimize error function, $f = (t,c)$
- Problems
 - Depend on only trajectory and central pressure (wind, SST, etc)
 - Weak on considering on typhoon affecting boundary

NNM (Nearest Neighbor Method)

EMF (Ensemble Mean Forecast)

- Compare with trajectory, central pressure and typhoon affecting boundary
- Select similar typhoon by comparing with special correlation
- Better Points
 - Set the correlation considering both trajectory, central pressure
 - Use Ensemble Mean Forecast method

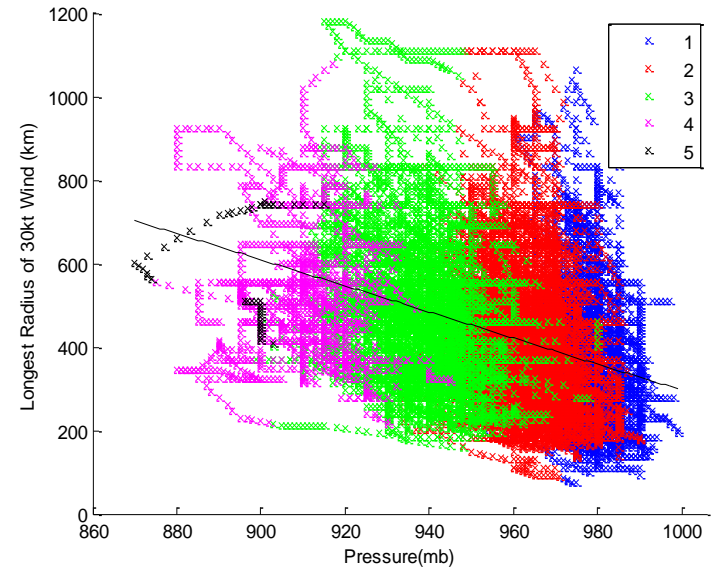
Relationship between Central Pressure and Max. Wind Speed
(1951–2008, RSMC, 1547 Typhoons)



$$V_{\max} = -0.36P_C + 383$$

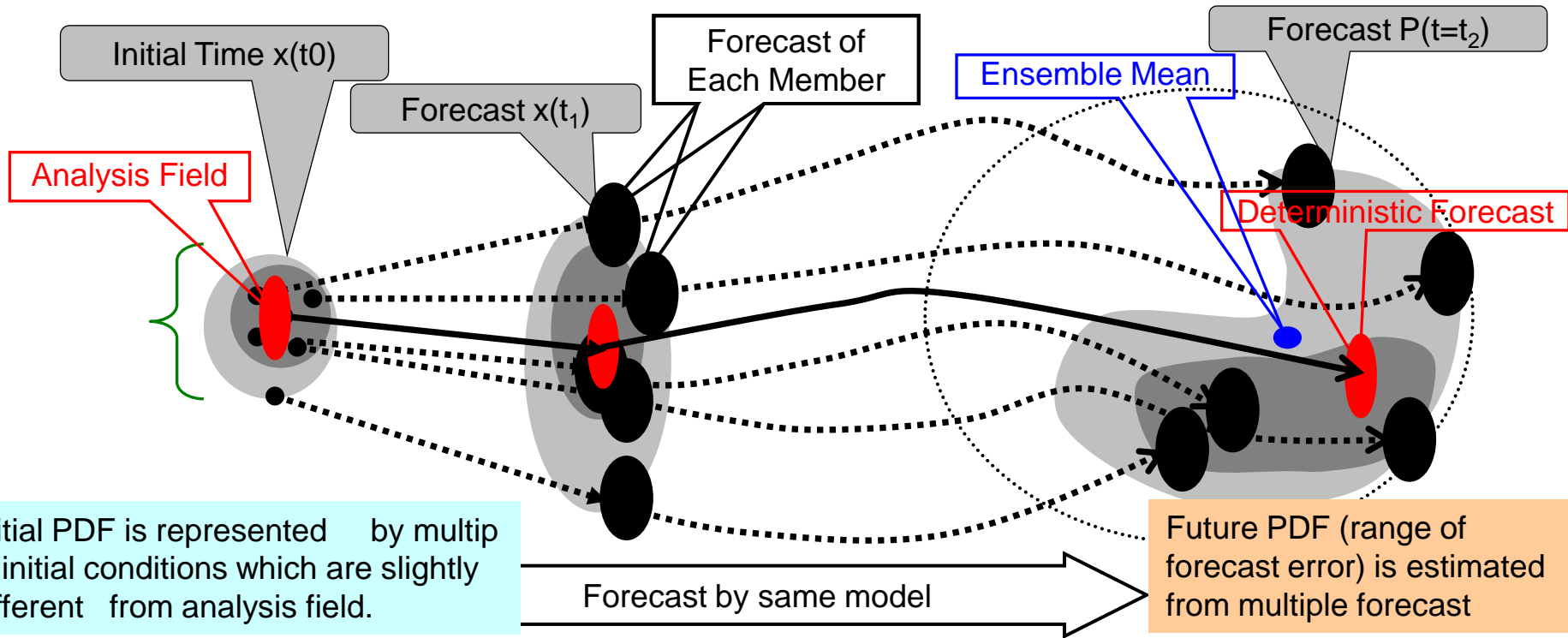
$$R_2 = 0.91$$

Relationship between Central Pressure and 30kts Wind Speed Boundary
(1951–2008, RSMC, 1547 Typhoons)



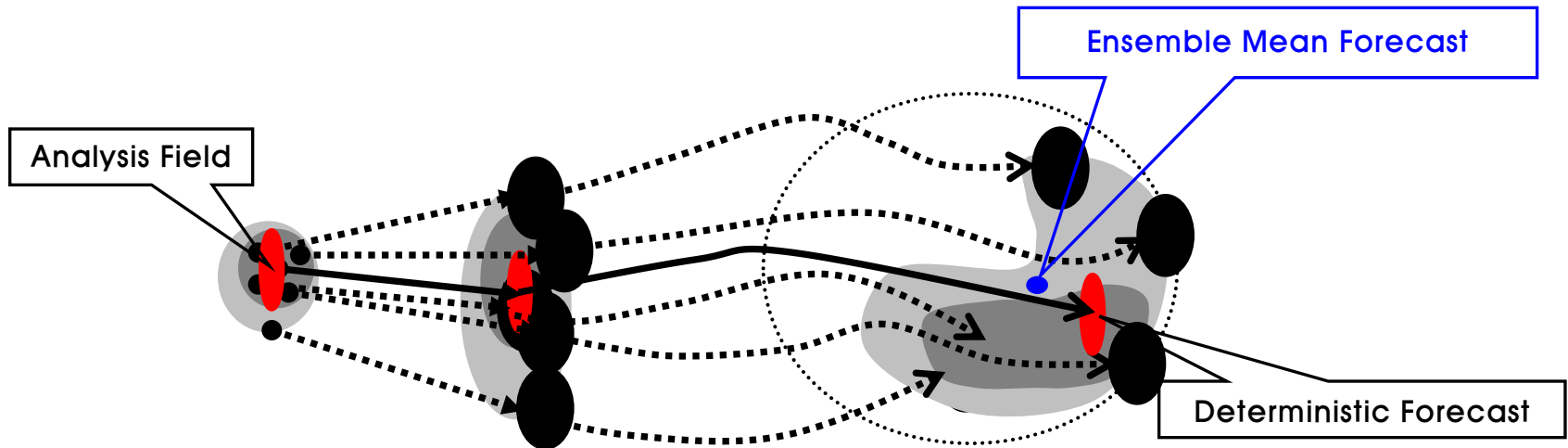
$$R_{30kts} = -3.1P_C + 3424$$

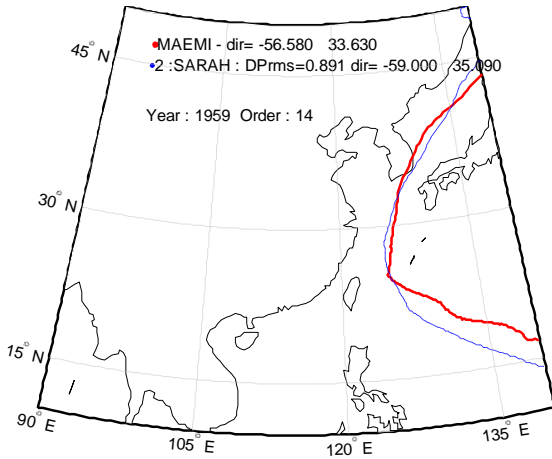
$$R_2 = 0.57$$



The ensemble prediction is a set of forecasts generated by NWP started from only slightly different initial conditions (added the perturbation into the analysis field).

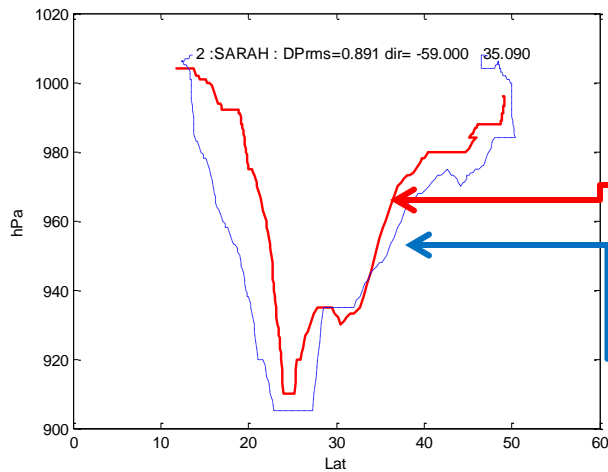
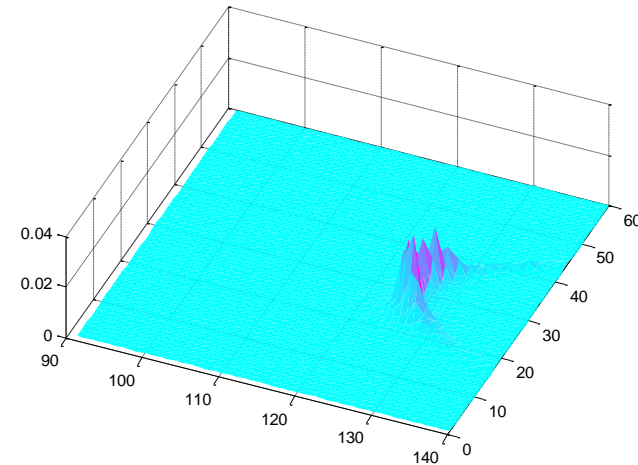
- ***“Ensemble mean forecast”*** is average of all ensemble forecasts. *It is approximately equal to the central value of forecast PDF.*
- Statistically, ensemble mean error, which is defined as the mean square distance between ensemble mean forecast and analysis, is almost half of deterministic forecast’s error.





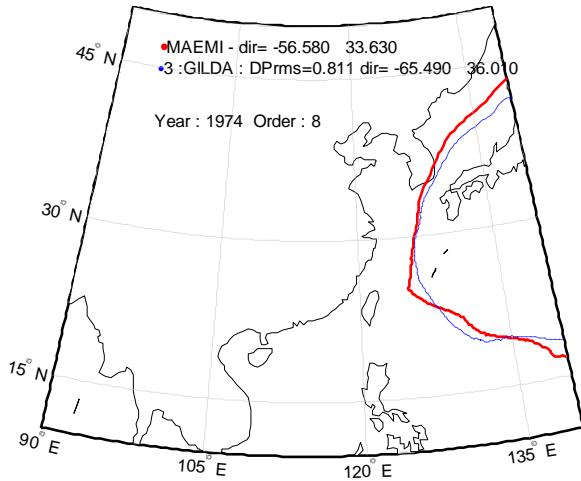
Normalized Spatial Correlation of Affected Region

Corr. Coeff = 89.1%



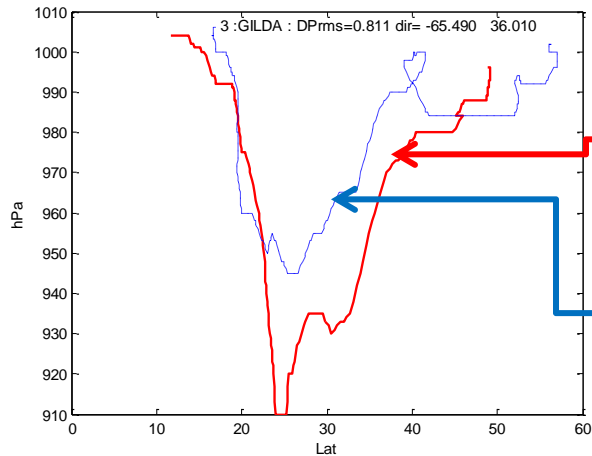
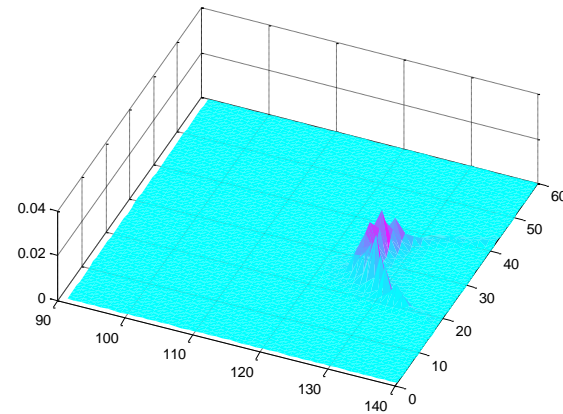
2003 MAEMI

1959 SARAH



Normalized Spatial Correlation of Affected Region

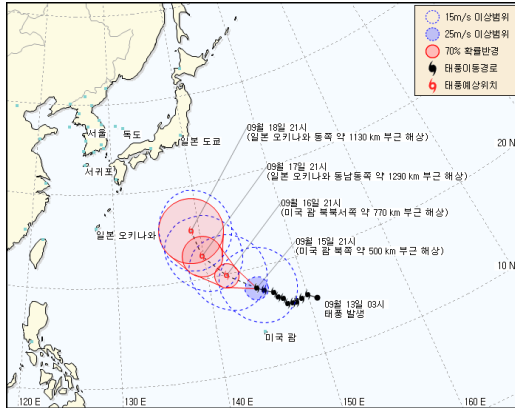
Corr. Coeff = 81.1%



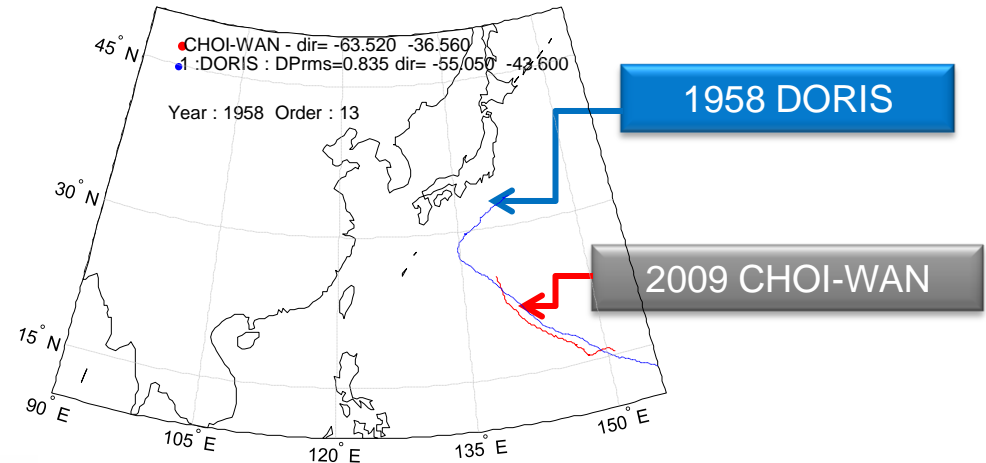
2003 MAEMI

1974 GILDA

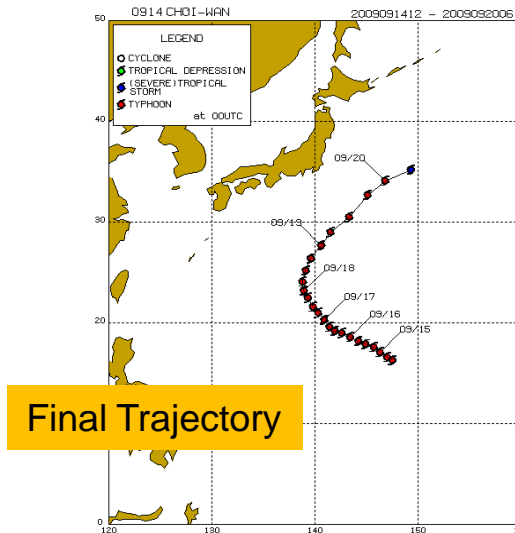
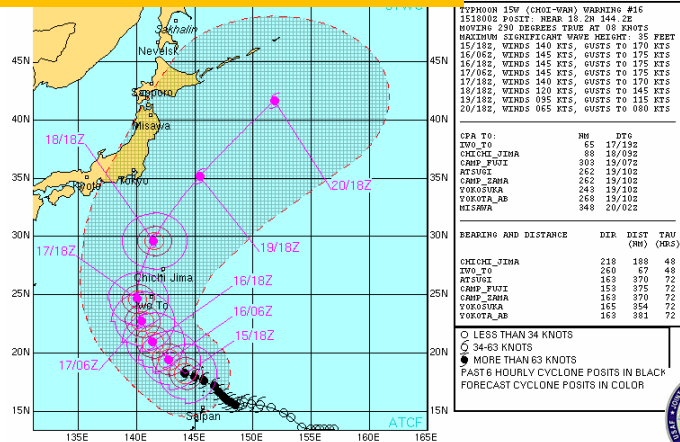
2009 14th Typhoon, CHOI-WAN - 2009.9.16 07:00 (KMA)

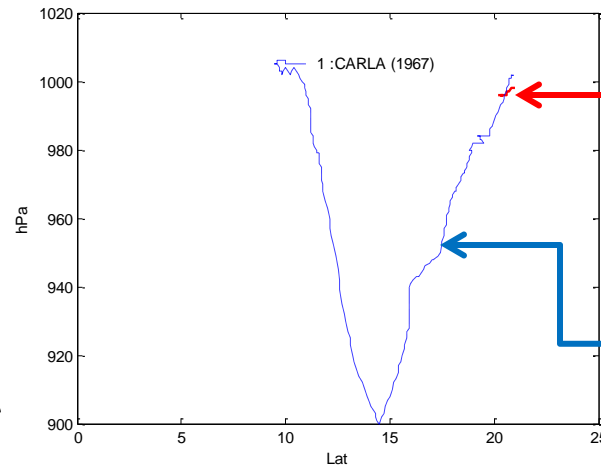
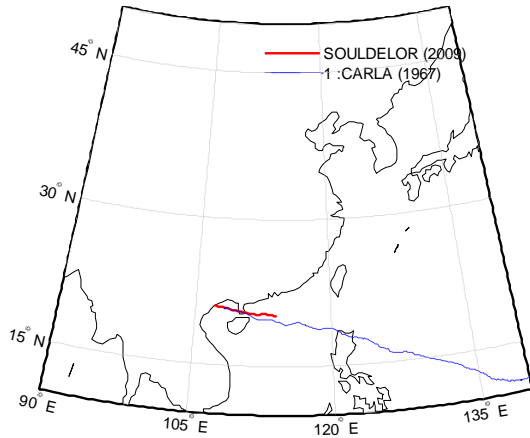


Similar Typhoon Results



- 2009.9.16 07:00 (JTWC)

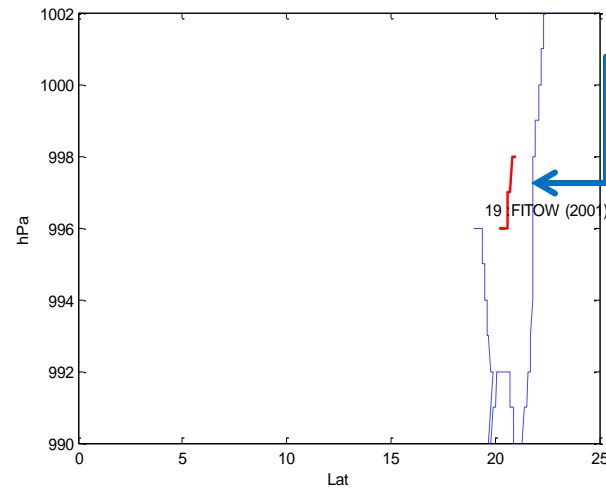
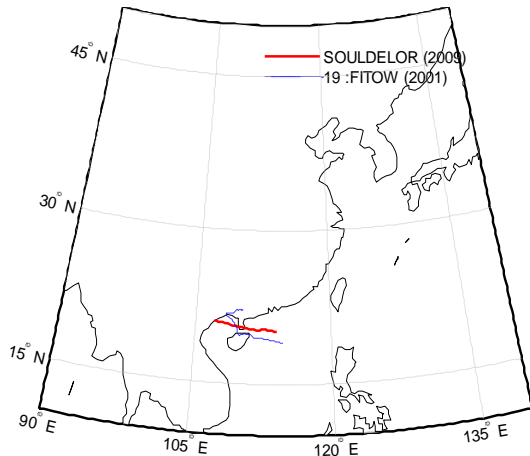




2009 SOUDELOR

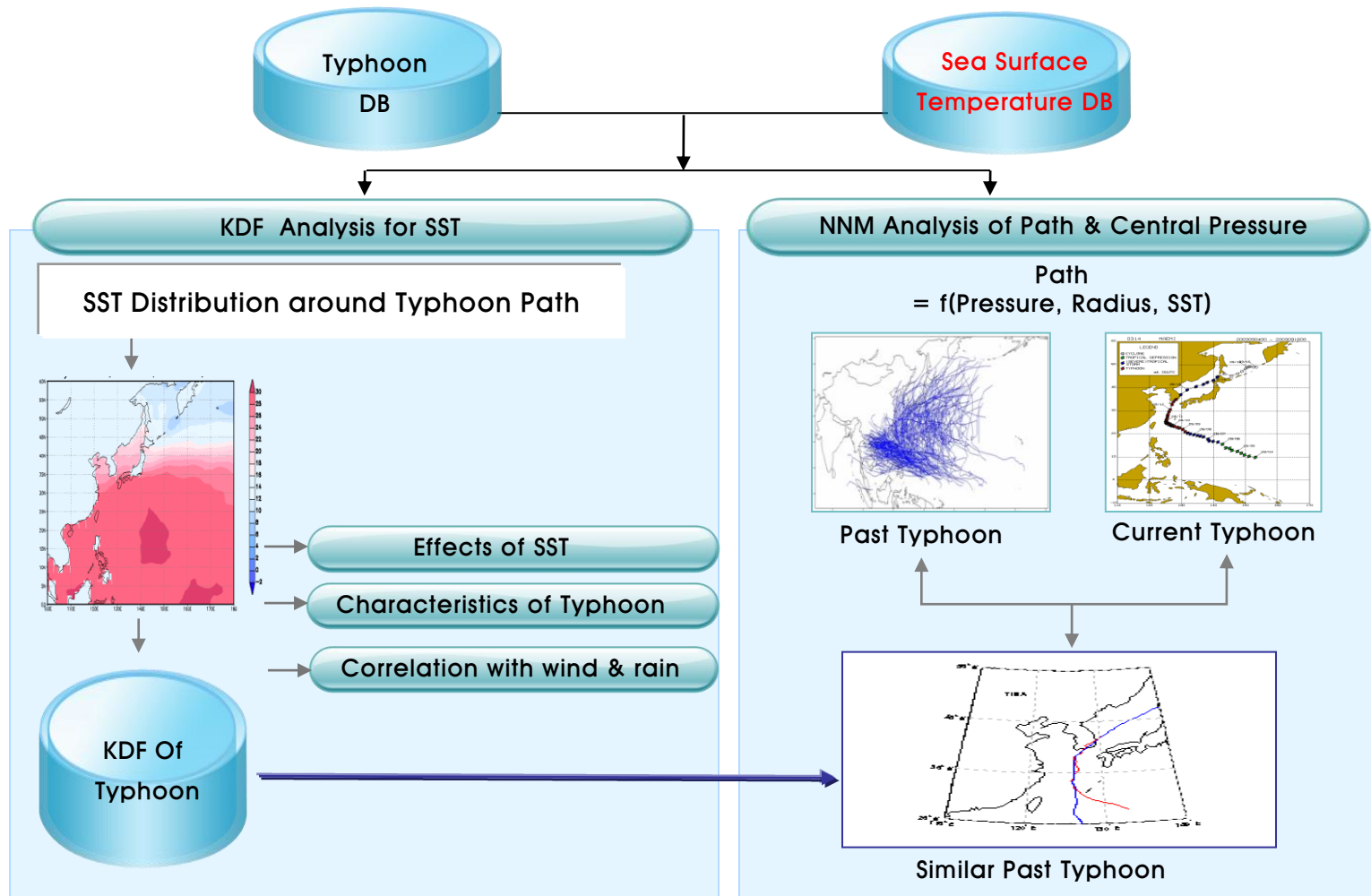
No big damages

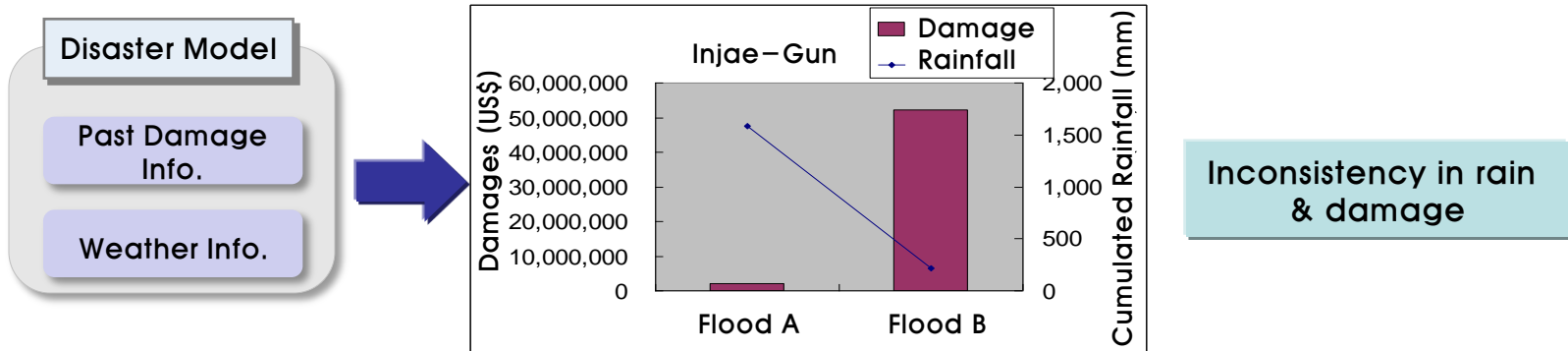
1967 CARLA



2001 FITOW

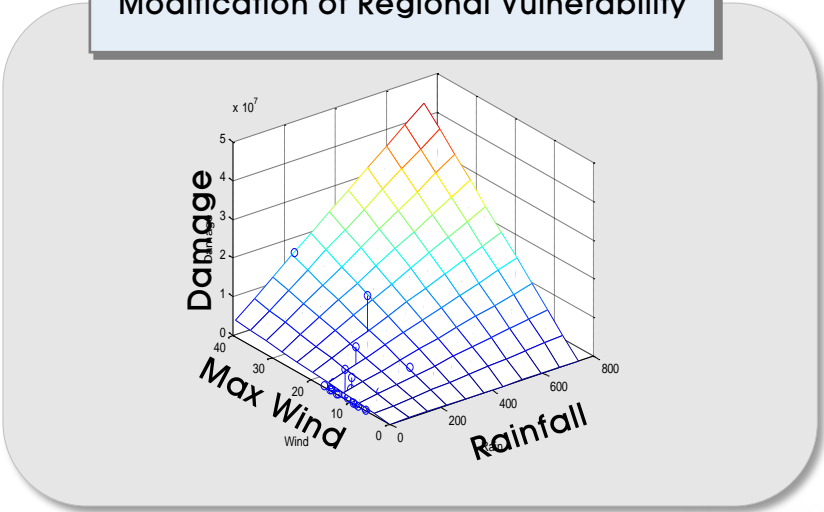
EM-DAT : No damages



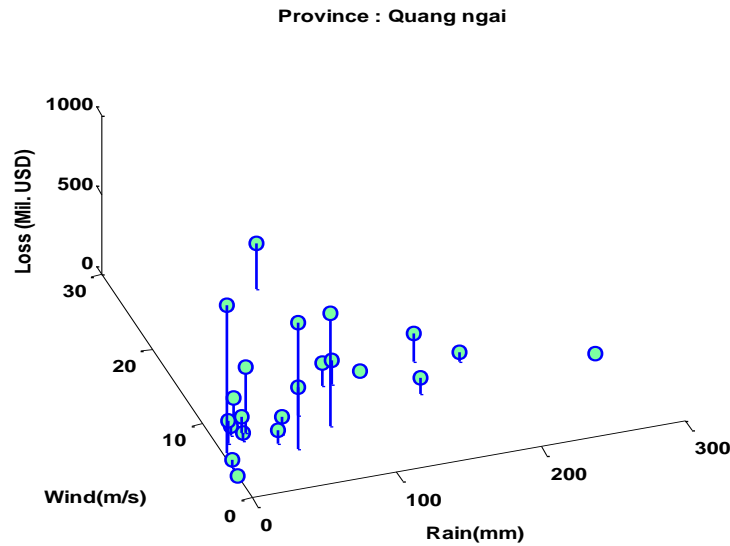


Cause Analysis
Damage Reduction due to
Post-Mitigation Measures

Modification of Regional Vulnerability

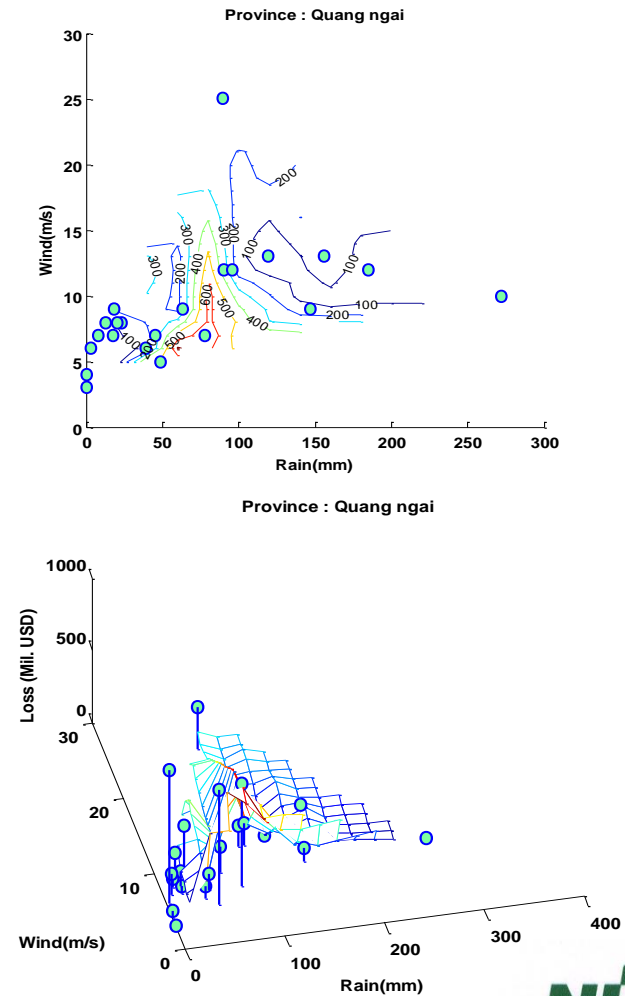


Multi Variable Interpolation Analysis

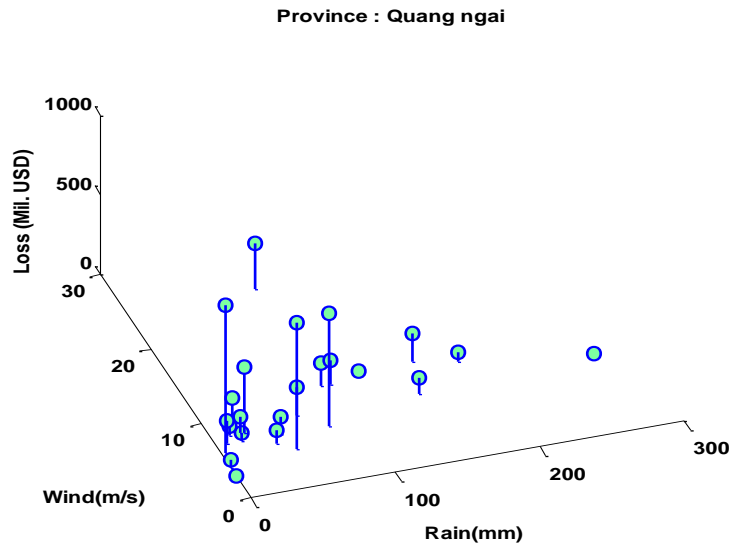


Total Damages in Quang nagi

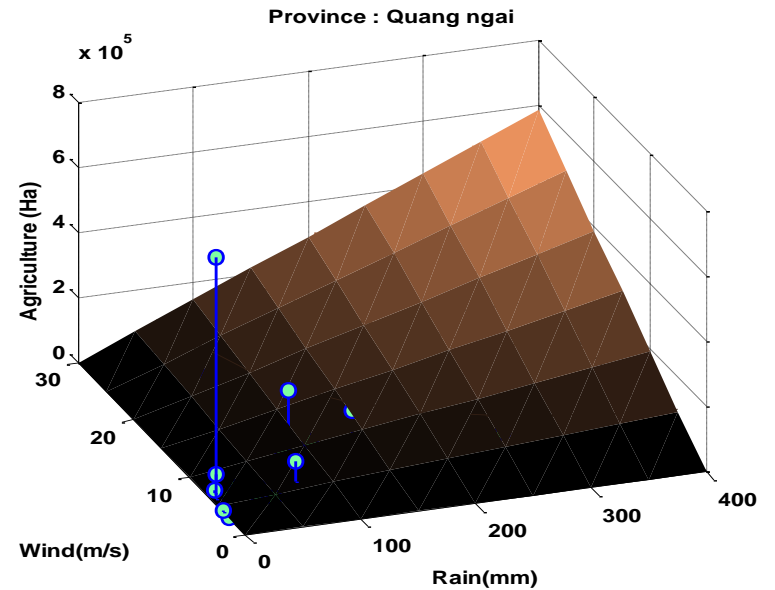
Multi Variable Interpolation



KDF Analysis

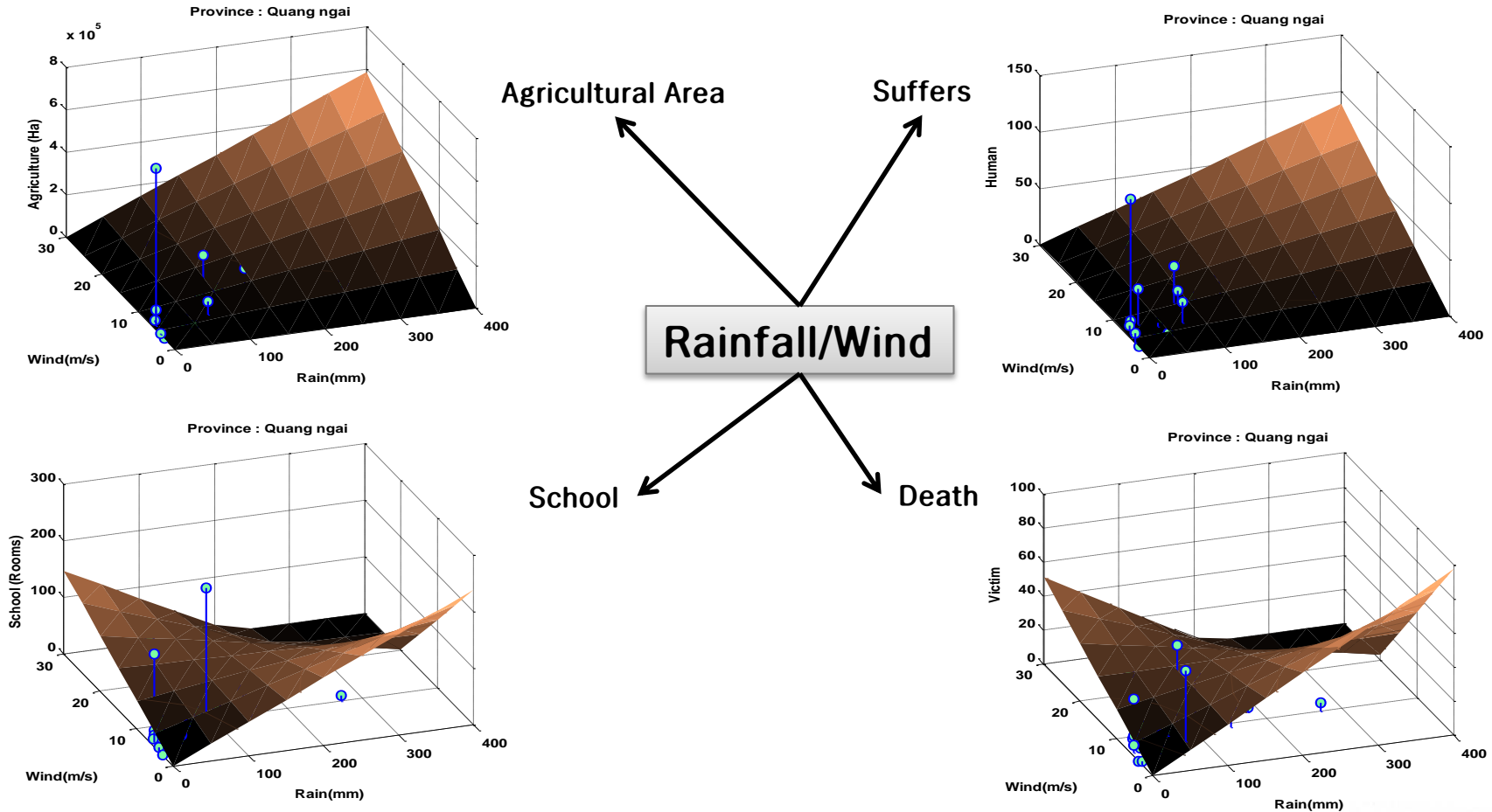


Total Damages in Quang ngai

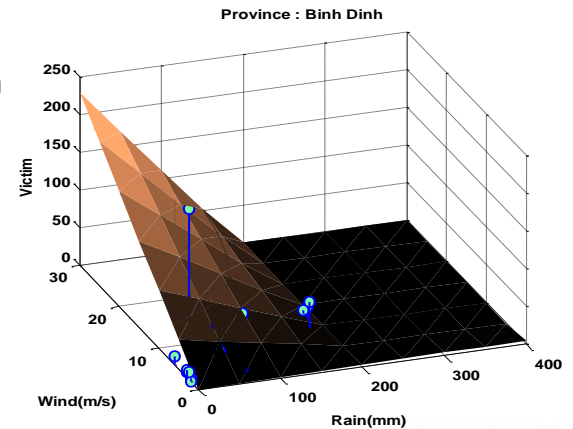
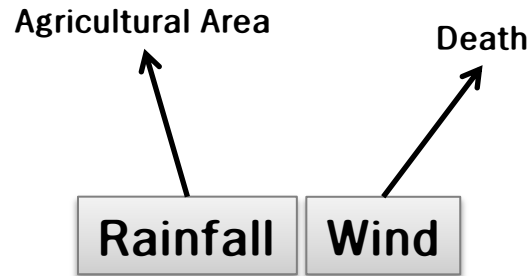
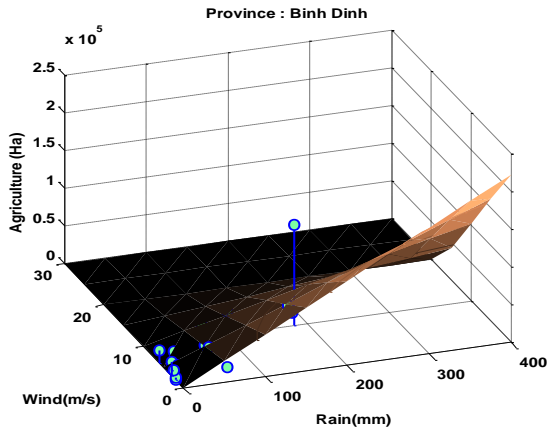
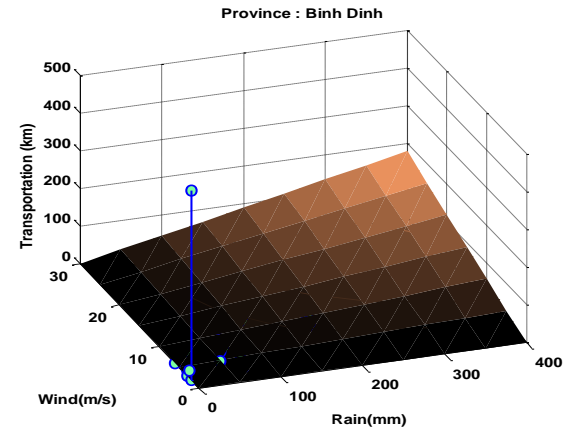
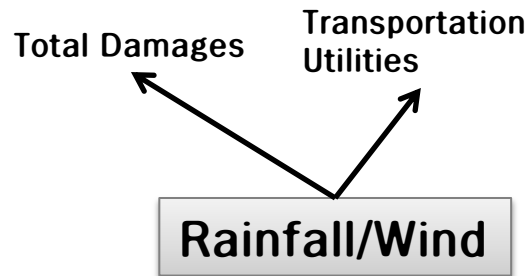
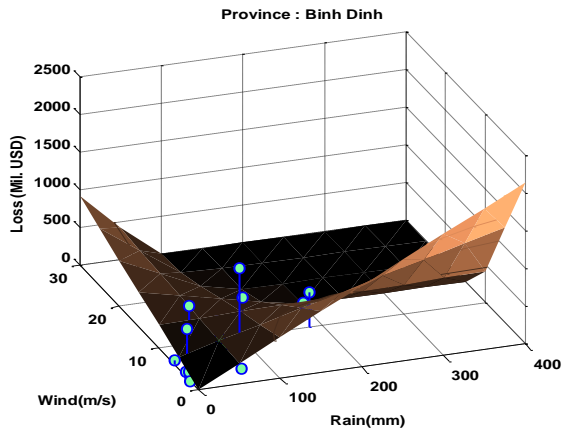


Result from KDF Analysis

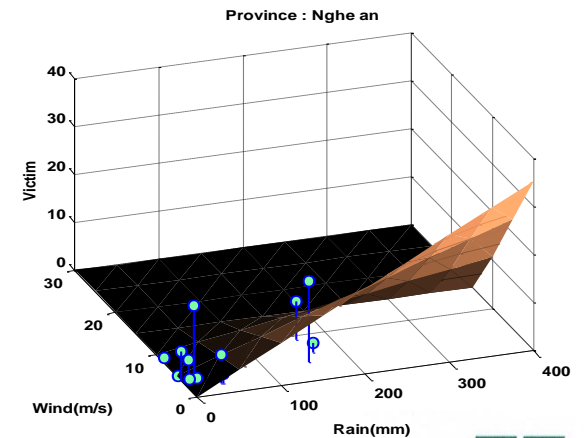
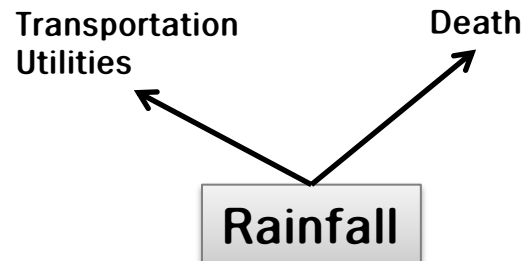
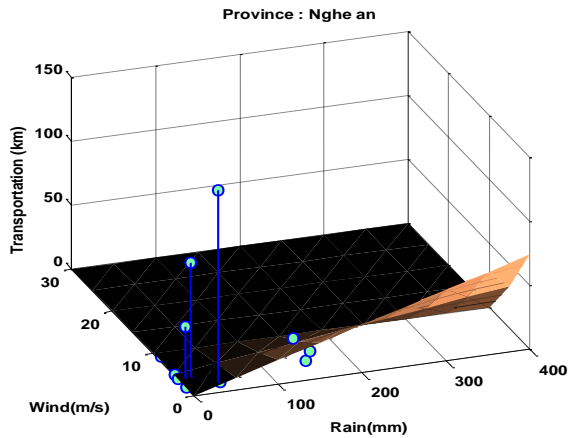
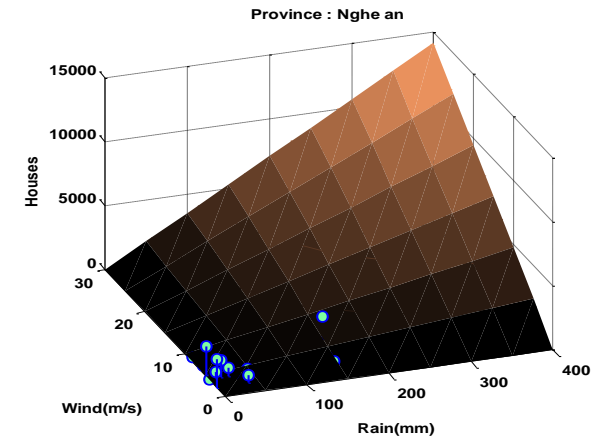
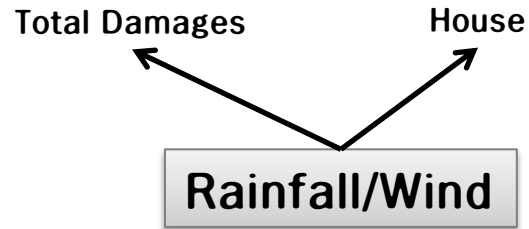
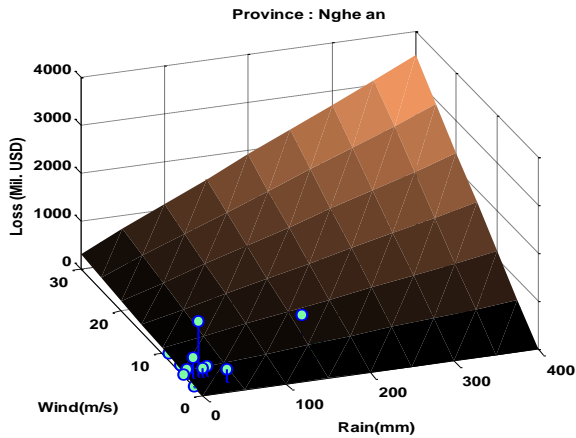
Quang ngai



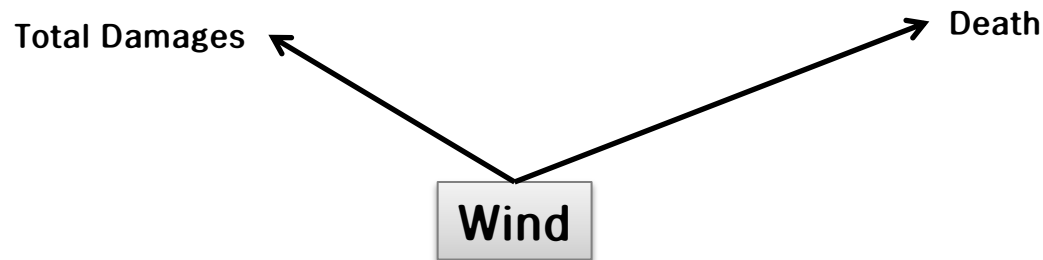
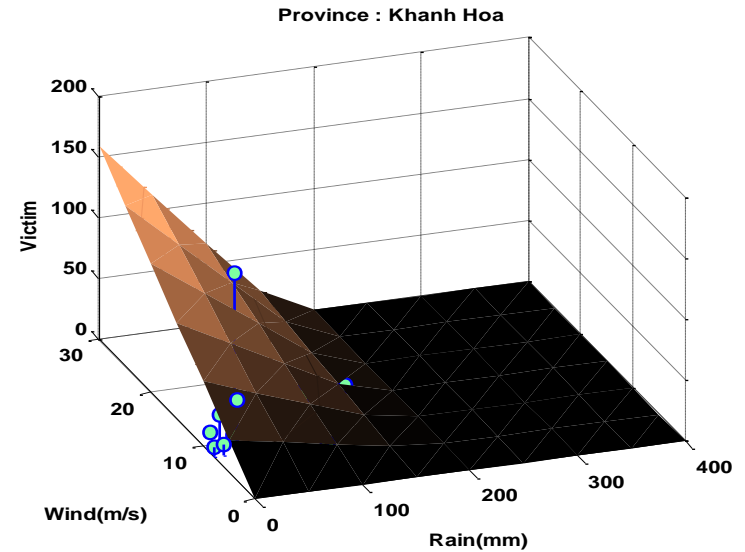
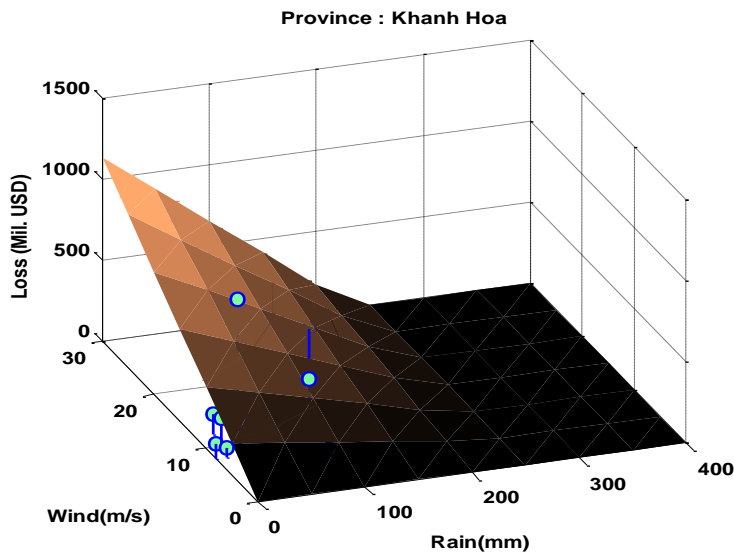
Binh Dinh



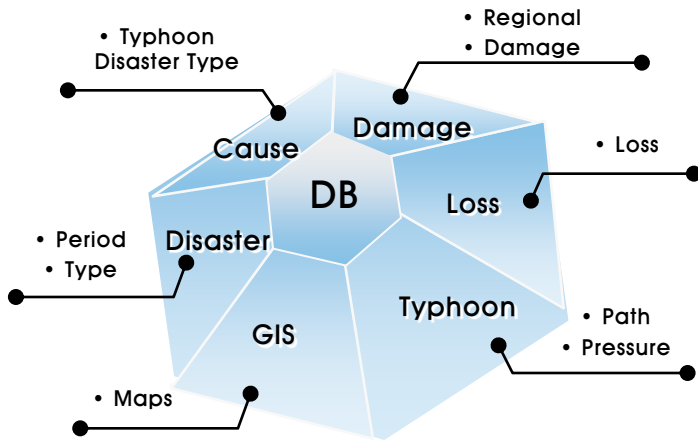
Bghe An



Khanh Hoa

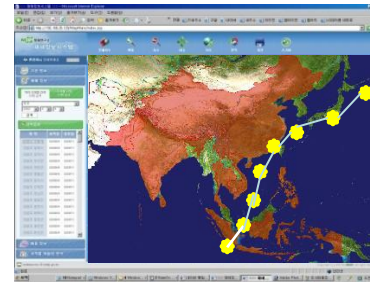


Typhoon Disaster

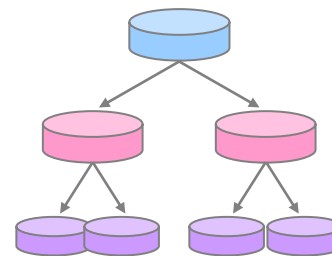
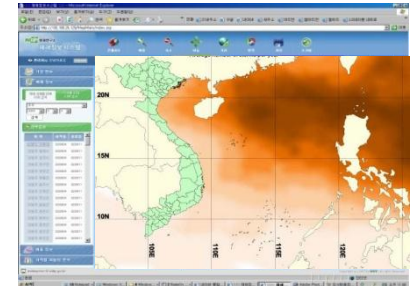


KMA Information

Typhoon Info.



Web-GIS based TCDIS

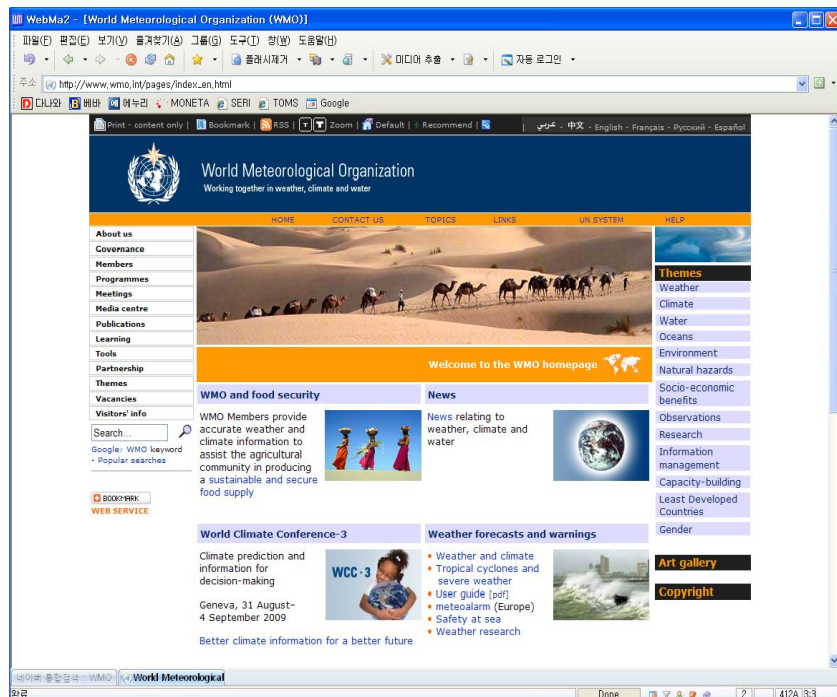


Risk Assessment



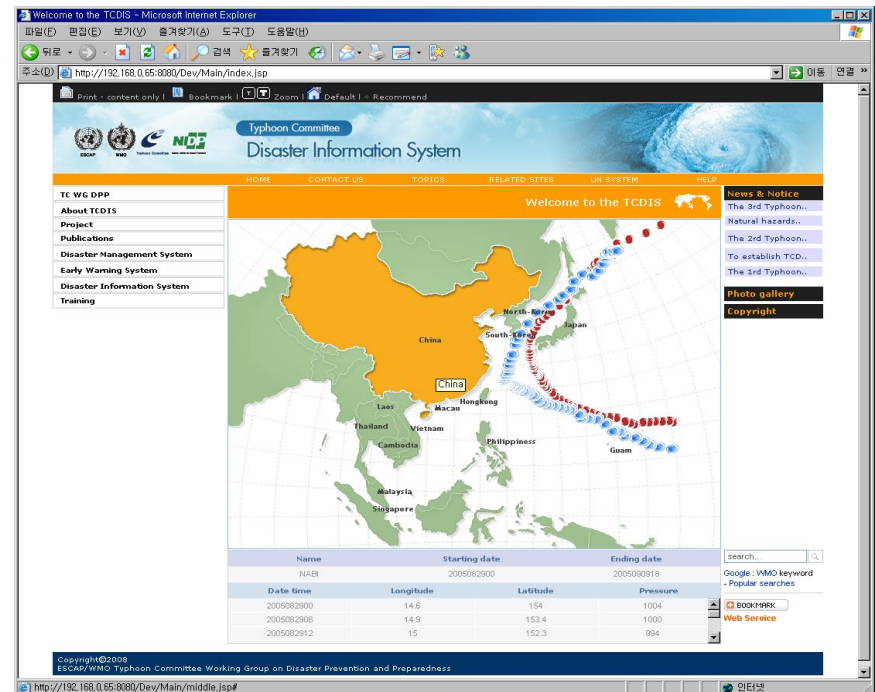
Damage Assessment

Main Features of TCDIS was developed following as WMO (World Meteorological Organization) Web Style Guide



WMO Main

TCDIS Main



Typhoon List | **Similar Typhoon Search**

Name:

Starting Dt. Year: Month:

Ending Dt. Year: Month:

Result

Name	Period	Fun
NABI	2005.08.29 ~ 2005.09.09	

Click

Typhoon List | **Similar Typhoon Search**

DataTime	Lat	Lon	Central Pressure
<input type="checkbox"/> 2005082900	146	1540	1004
<input type="checkbox"/> 2005082906	149	1534	1000
<input type="checkbox"/> 2005082912	150	1523	994

Input parameter from file
Save parameter to file

Click

Disaster Information System :: -- 웹 페이지 대화 상자

[BART] Disaster Type Damage Information

Region	Victim Damage (person)	Casualties Damage (person)	Flooding Region (ha)	Building Damage (1 Dollar)	Ship Damage (1 Dollar)	Field Damage (1 Dollar)	Public Equipment (1 Dollar)			Private Equipment (1 Dollar)
							River Damage (1 Dollar)	Transport Equipment (1 Dollar)	Etc public Equipment (1 Dollar)	
경상남도 고성군	0	0	0	0	0	9,584	1,679,076	923,818	364,273	0
경상남도 남해군	0	0	0	0	0	0	103,286	53,948	163,867	0
경상남도 마산시	0	0	0	0	0	12,408	222,230	7,500	55,786	0
경상남도 밀양시	0	0	0	0	0	0	0	0	0	0

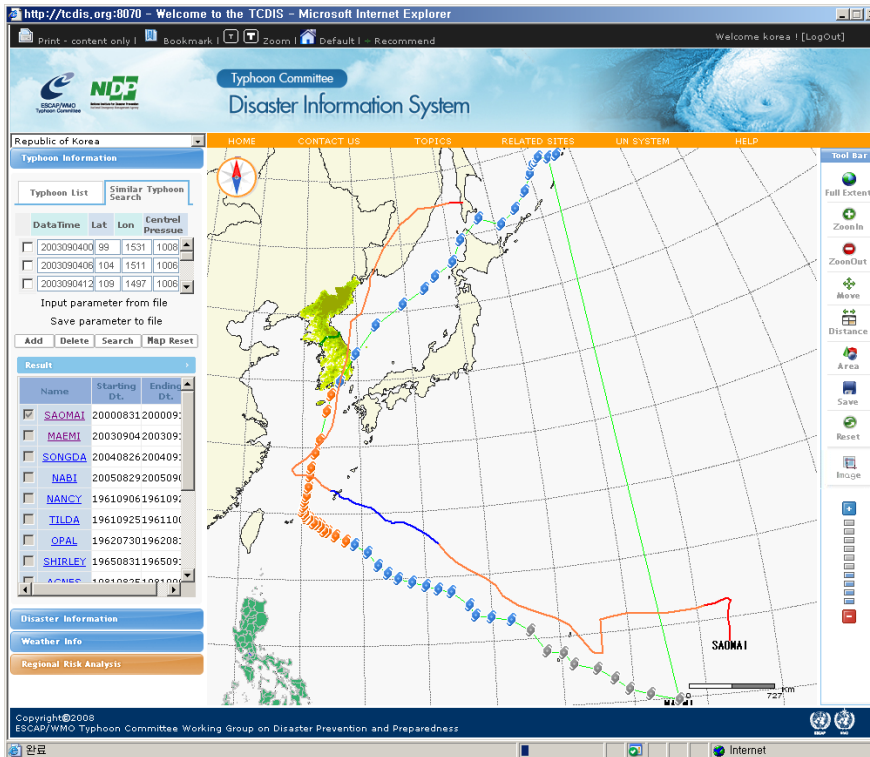


Typhoon BART

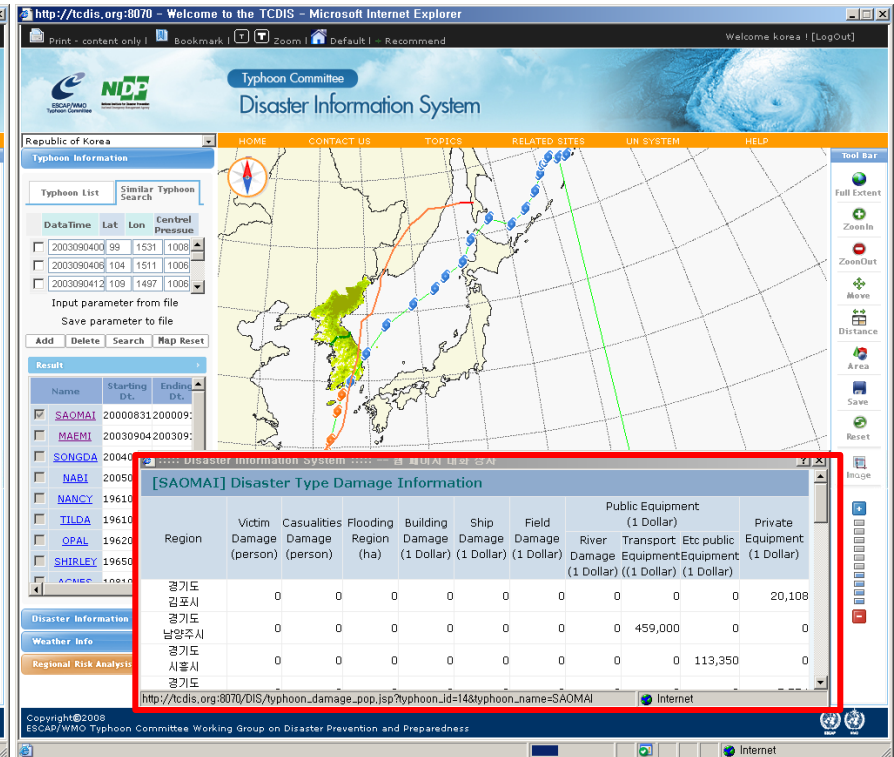
Result

<input type="checkbox"/> NABI	2005082920050909
<input type="checkbox"/> LOUISE	1955092019551000
<input type="checkbox"/> NANCY	1961090619610900
<input type="checkbox"/> SHIRLEY	1965083119650900
<input type="checkbox"/> HELEN	1966091619660900
<input type="checkbox"/> OLIVE	1971072419710800
<input type="checkbox"/> NANCY	1979091519790900
<input type="checkbox"/> ORCHID	1980090419800900
<input type="checkbox"/> JANIS	1992080319920800
<input type="checkbox"/> BART	1999091719990900

Click

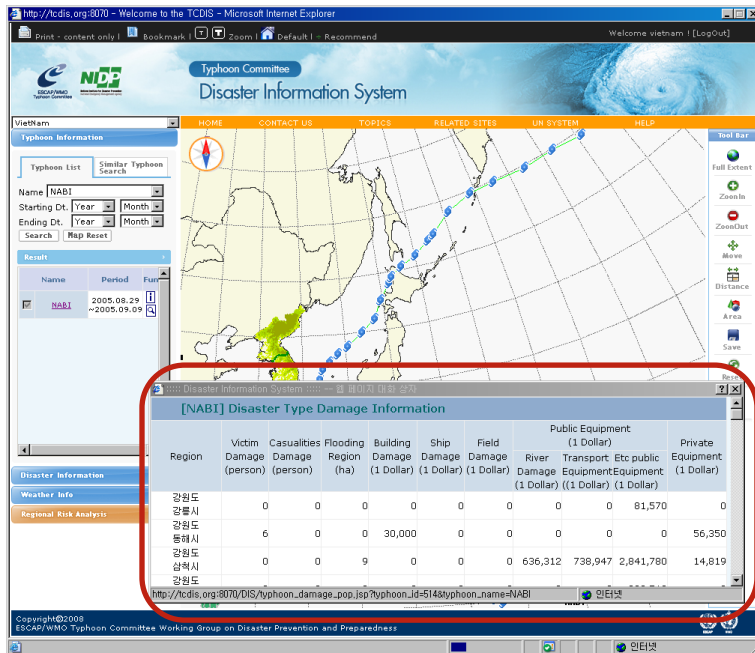


Estimates Similar Typhoon Trajectory

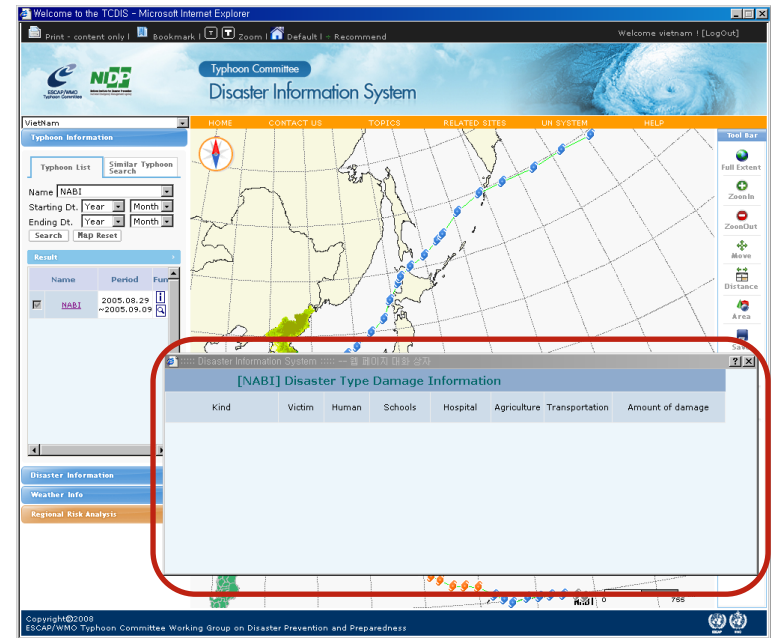


Estimates Typhoon Related Damages

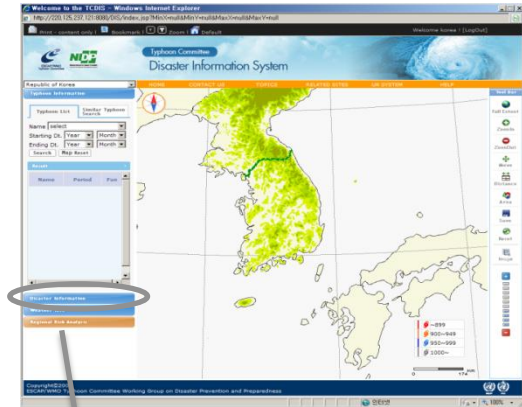
Typhoon NABI Information



Estimates Typhoon Related Damages



Estimates Typhoon Related Damages



Region	Victim	Casualties	Flooding (ha)	Building damage	Ship damage	Field damage	Communal facilities			Private facilities
							River damage	Road damage	Etc	
경기도 안성군	0	0	0	0	0	0	0	0	0	0
경기도 양평군	0	0	0	0	0	0	0	0	5,421	12,000
제주특별자치도 북제주군	0	0	0	0	0	0	0	0	0	0
충청남도 당진	0	0	1,785	0	0	0	0	0	0	0
충청남도 보령	0	0	218	333	0	0	0	0	0	0
충청남도 서산	0	0	337	0	0	0	0	0	0	0
충청남도 서산	0	0	258	0	0	1,224	0	0	0	0
충청남도 아산	0	0	645	0	0	0	0	0	0	0
충청남도 연기	0	0	72	0	0	0	0	0	0	0
충청남도 예산	0	0	149	0	0	0	0	0	0	0
충청남도 천안	0	0	694	0	0	0	0	0	0	0
충청남도 태안	0	0	4,255	902	0	75,343	0	0	3,396	0
충청북도 음성	0	0	813	0	0	2,994	0	16,520	6,545	0
충청북도 진천	0	0	15	0	0	0	0	17,280	0	0

Disaster Information

Damage List by Disaster Type Damage List by Region

From Dt. 1991 1 1

To Dt. 2005 12 31

Search **Map** **Reset**

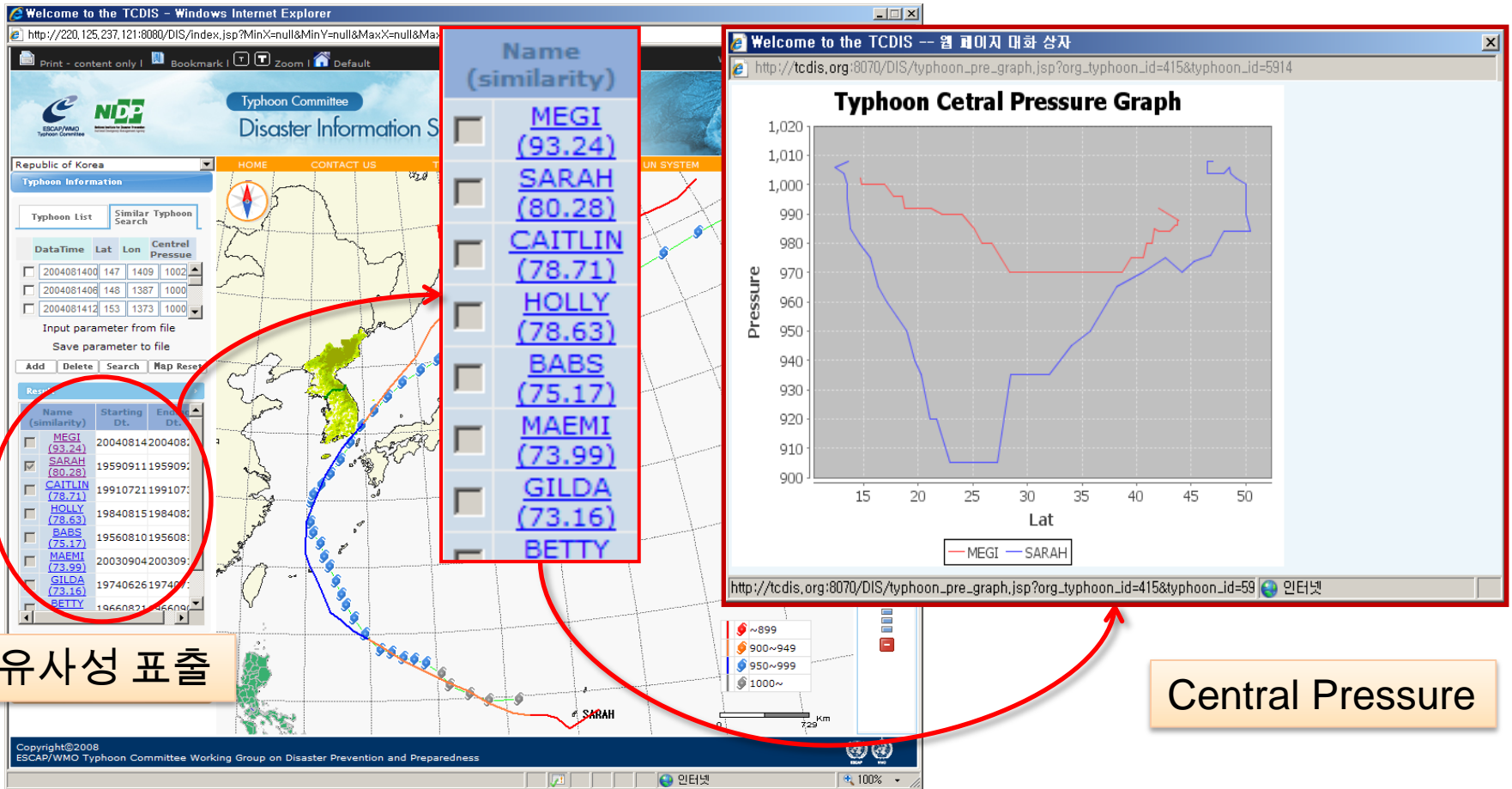
Result

Kind	Number [Show Graph]
Cold storm	1
Hail	10
Hail thunder	1
Heavy rain	83
Heavy snow	11
Rainstorm	5
Seawater flood	1
Snow	1
Snowstorm	17

Result

Type	Period
Heavy rain	1991/04/17 ~ 1991/04/18
	1991/05/26 ~ 1991/05/27
	1991/06/01 ~ 1991/06/02
	1991/06/09 ~ 1991/06/10
	1991/07/04 ~ 1991/07/04
	1991/07/10 ~ 1991/07/13
	1991/07/15 ~ 1991/07/16
	1991/07/20 ~ 1991/07/26
	1991/07/31 ~ 1991/08/01

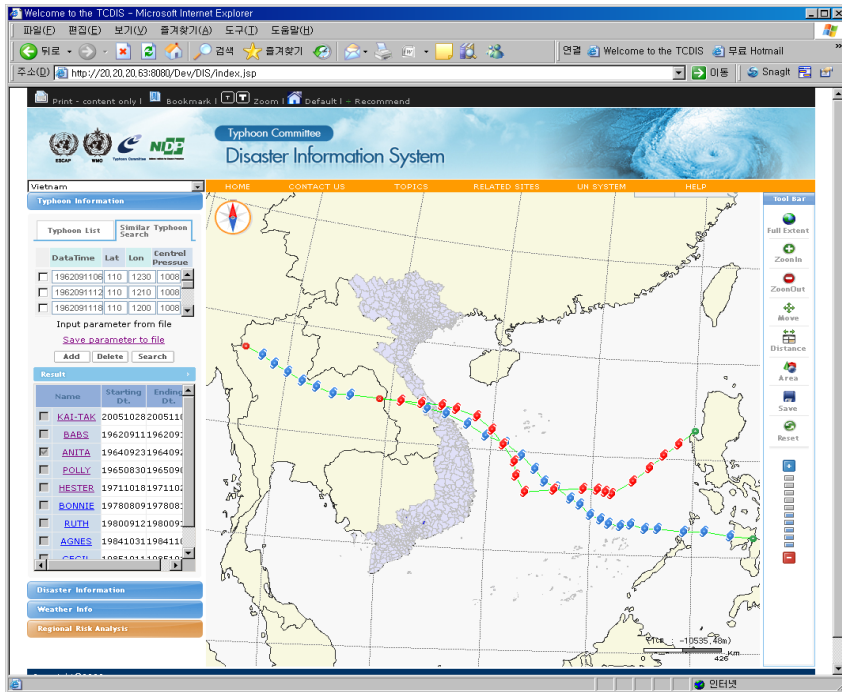




유사성 표출

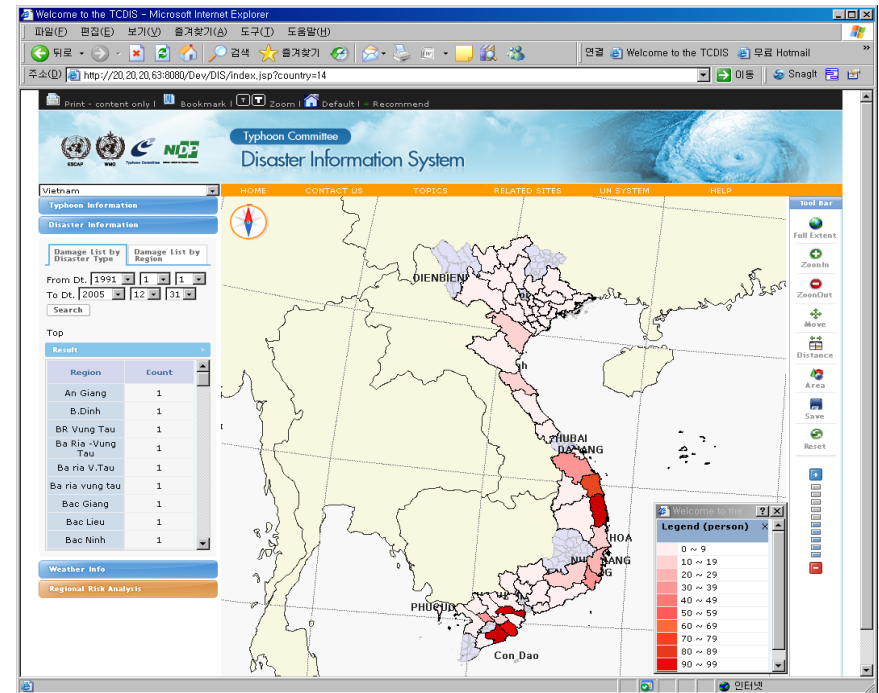
Central Pressure

Trajectory of Typhoon (Viet Nam)



Typhoon Trajectory

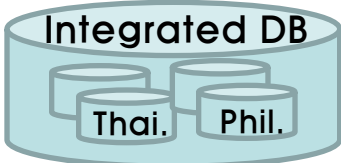
Typhoon Related Damages



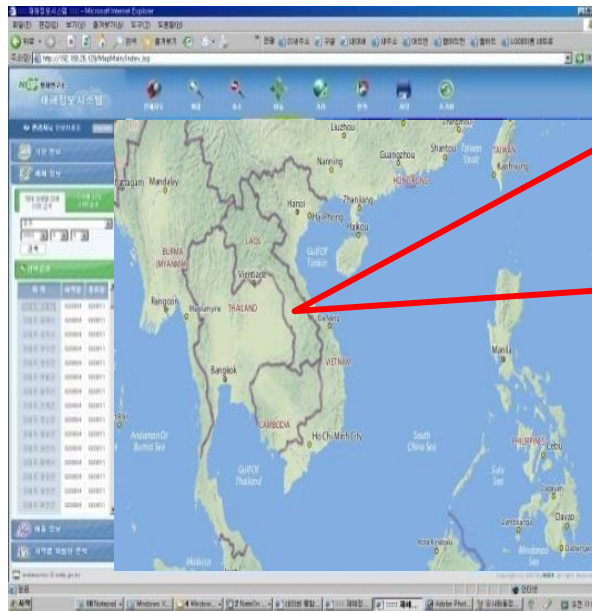
Year	Country	Disaster Type	Standard Code
19910101	19910101	19910101	19910101
19910102	19910102	19910102	19910102
19910103	19910103	19910103	19910103
19910104	19910104	19910104	19910104
19910105	19910105	19910105	19910105
19910106	19910106	19910106	19910106
19910107	19910107	19910107	19910107
19910108	19910108	19910108	19910108
19910109	19910109	19910109	19910109
19910110	19910110	19910110	19910110
19910111	19910111	19910111	19910111
19910112	19910112	19910112	19910112
19910113	19910113	19910113	19910113
19910114	19910114	19910114	19910114
19910115	19910115	19910115	19910115
19910116	19910116	19910116	19910116
19910117	19910117	19910117	19910117
19910118	19910118	19910118	19910118
19910119	19910119	19910119	19910119
19910120	19910120	19910120	19910120
19910121	19910121	19910121	19910121
19910122	19910122	19910122	19910122
19910123	19910123	19910123	19910123
19910124	19910124	19910124	19910124
19910125	19910125	19910125	19910125
19910126	19910126	19910126	19910126
19910127	19910127	19910127	19910127
19910128	19910128	19910128	19910128
19910129	19910129	19910129	19910129
19910130	19910130	19910130	19910130
19910131	19910131	19910131	19910131

Country-wise Disaster Info.

Standard Code & DB for Management



Abstraction



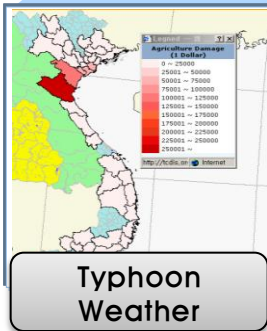
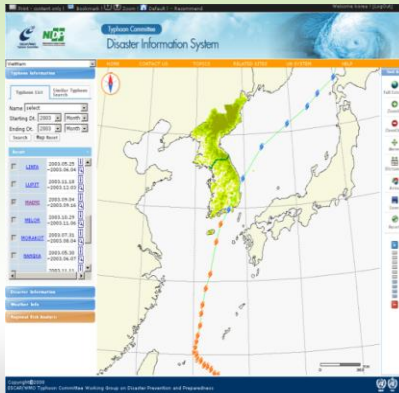
- Weather Station
- Past Meteorological Data
- Typhoon Info.
- Damage Statistics
- Damage Phtos.

Display

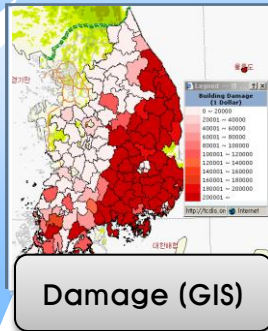
GIS-base Damage Info.

Typhoon Information System

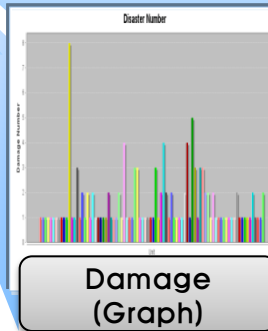
1st, 2nd Phase



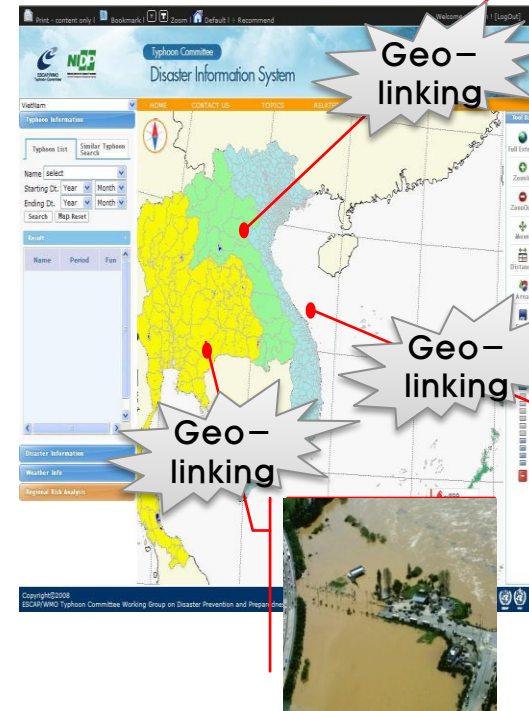
Typhoon Weather



Damage (GIS)



Damage (Graph)



Typhoon Committee
Disaster Information System

HOME CONTACT US TOPICS RELATED SITES UN SYSTEM

Welcome to the TCDIS

WEB GIS Based
Typhoon Committee
Disaster Information System Manual

Name	Starting date	Ending date	
JULY 2009 JABI	2005082900	20050909	
Date time	Longitude	Latitude	Pre
2005082900	14.6	154	10
2005082906	14.9	153.4	10
2005082912	15	152.3	99

1 Introduction

2 Activities of TC & WGDPP

3 WEB GIS Based TCDIS

4 Conclusion

Conclusion

Conclusion

- **Report Annual Activities of TC**
- **Suggest Future Work Plan**
- **Collect DMS and EWS from 12 TC Members**

China; Hong Kong, China; Japan; Lao PDR; Malaysia; Philippines;
Republic of Korea; Macao, China; Singapore; Thailand; USA; and Viet Nam

- **Summary and Report on WEB GIS Based TCDIS**
- **Development of New Estimation Method to estimate the Typhoon Trajectory and Damage**

Thank you...

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National Institute for Disaster Prevention

