

Present status and future plans for the Tidal observation and service at KHOA

**Korea Hydrographic & Oceanographic Administration
Ministry of Land, Transport and Maritime Affairs**

Contents

**I. GENERAL INTRODUCTION
& STATUS OF TIDAL OBSERVATION**

II. NOW & FUTURE PLANS

I.

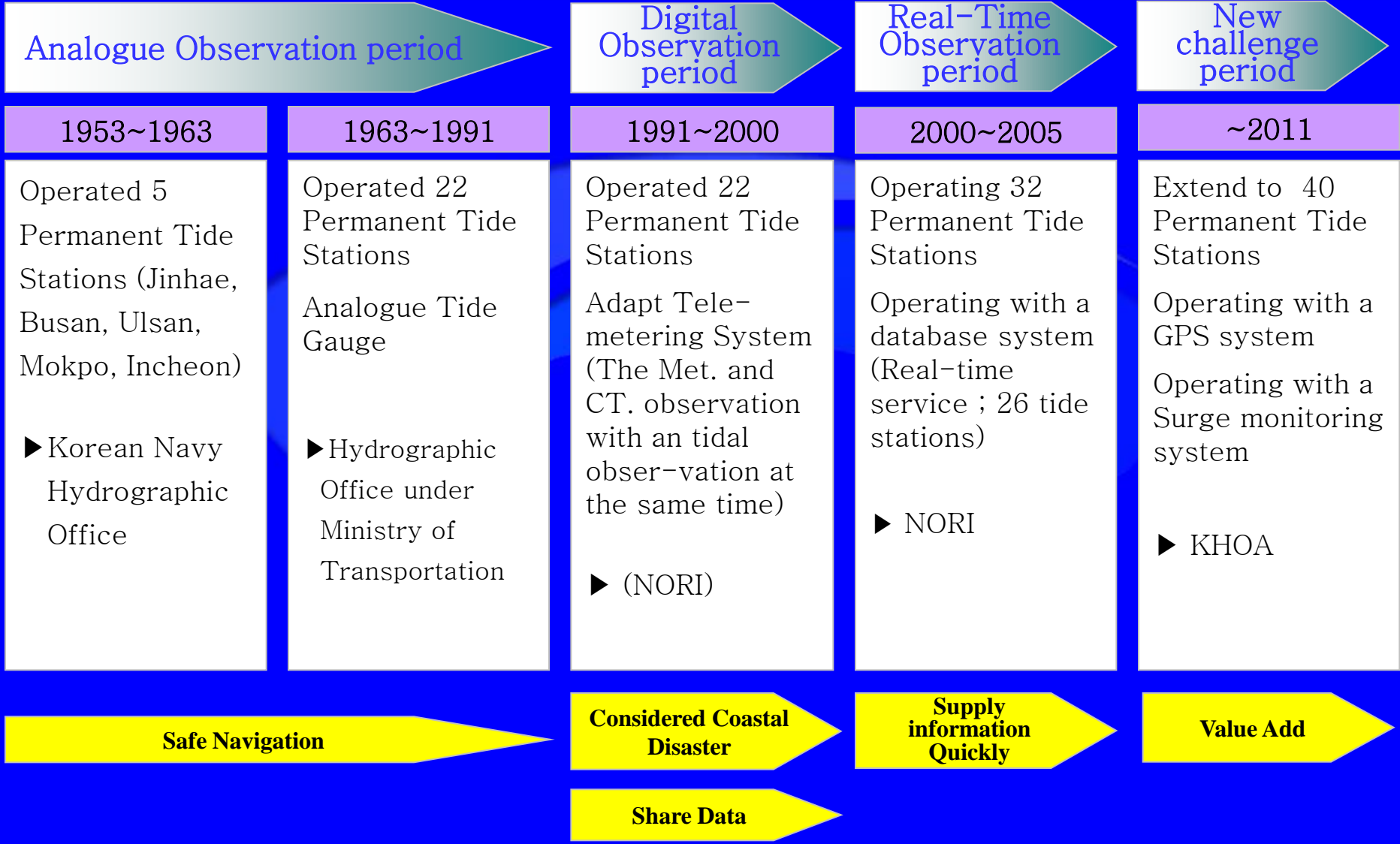
GENERAL INTRODUCTION & STATUS OF TIDAL OBSERVATION

Ocean characteristics of the Korean peninsula



- Surrounded by the Yellow Sea, East China Sea and East Sea
- Different bottom topography
- Different coastline shape
- Distinct Seasonal change
- Each coast show very distinguished tidal pattern
- Affected by the Kuroshio
- Affected by a typhoon every year

History of Tidal Observation



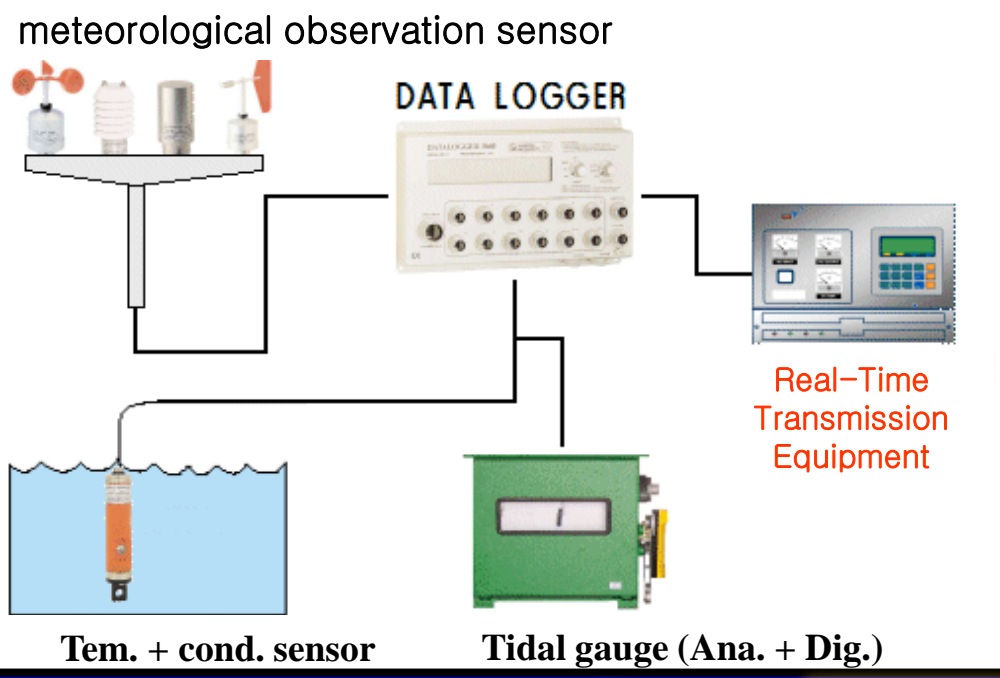
Distribution of Tidal Station



Real Time Observing Station

범례 ('07년 56개소 → '08년 58개소)

- Tidal Station(인천 등 37개소) → 1개소(38개소)
- Ocean Buoy (3개소) → 1개소(4개소)
- ▲ Coastal Station (15개소)
- 🌿 Ocean Research Station(1개소)



부표식 려조기

TIDAS(Tide Data Analysis System) _ Oracle DB



TIDAS II Version 0.4.31

분석 자료관리 자료출력 고조정보 시스템 도움말 종료

자료관리 > 조위관리 > 조위수정 > 1시간조위수정

1시간조위수정

검조소 종류 표준검조소
 검조소 선택 인천
 기간 2004년 05월

평균 해면 값
 데이터베이스 값 사용 490.41
 참고 : 계산된 값은 예보조위상수기간 40여분초간의 합(M2+S2+K1+O1)입니다.

조회 삭제 DB 저장 재계산 T Editor 도움말 잠금정보 닫기

현재 검조소 : 인천

#	연월일	평균	0시	1시	2시	3시	4시	5시	6시	7시	8시	9시	10시	11시	12시	13시	14시	15시	16시	17시	18시	19시	20시	21시	22시
1	2004-05-01	542	613	640	616	547	446	336	246	206	234	330	454	582	680	734	732	668	564	440	330	241	206	253	
2	2004-05-02	496	619	704	734	697	594	460	333	220	159	188	306	463	610	714	780	761	664	522	380	246	145	126	
3	2004-05-03	364	531	679	769	787	723	589	430	279	151	97	157	312	450	659	776	815	767	625	456	294	142	57	
4	2004-05-04	214	406	595	749	828	820	711	541	370	200	79	46	139	326	543	707	813	826	735	568	387	216	74	
5	2004-05-05	92	285	519	711	850	903	848	701	521	345	177	68	82	225	441	627	786	659	632	698	509	324	148	
6	2004-05-06	25	160	380	600	796	914	935	835	665	476	298	138	58	107	283	479	667	793	830	766	600	410	224	
7	2004-05-07	-31	-16	205	414	638	818	912	905	793	611	426	253	113	64	163	325	513	694	793	801	710	535	350	
8	2004-05-08	-88	-16	86	278	490	700	845	910	877	744	573	408	248	138	123	231	403	567	711	781	759	650	476	
9	2004-05-09	150	41	45	167	360	552	730	845	882	698	549	400	259	174	189	299	450	579	690	730	691	595		
10	2004-05-10	283	154	82	113	242	405	579	724	807	826	768	657	521	400	289	222	238	335	454	563	651	678	636	
11	2004-05-11	414	286	191	141	180	289	421	562	662	743	758	716	621	511	402	311	266	284	363	446	534	603	632	
12	2004-05-12	542	452	347	258	216	238	318	418	534	637	691	705	693	647	549	462	373	308	303	348	411	504	578	
13	2004-05-13	624	580	509	407	310	244	238	287	368	465	563	648	685	681	633	564	458	380	283	251	278	350	438	
14	2004-05-14	608	642	628	561	463	357	268	220	237	319	433	551	649	704	710	662	573	459	350	257	213	240	331	

자료관리 > 조위관리 > 조위생성 > 매월조위생성

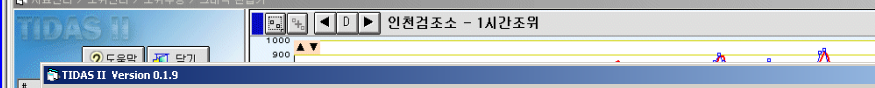
매월조위 생성

검조소 종류 표준검조소
 변환 기간 2000년 10월 부터 2000년 10월 까지

중복 자료 처리
 덮어 쓰기
 기존 자료 유지
 중복자료 발견시 작업 취소

배치 작업으로 수행

시작 닫기 도움말



TIDAS II Version 0.1.9

호출/분석 자료관리 자료출력 고조정보 시스템 도움말 종료

자료관리 > 조화상수 관리 > 조화상수 수정

조화상수 수정

검조소 종류 표준검조소
 검조소 이름 부산

조화상수 기간

시작일	종료일	방법	A0	조화상수	진폭	지각	비조화상수
2001-01-01	2001-12-31	조사원		M2	39.95	232.81	평균고조간격(M.H.W.T) : KM/29 = 8시간 2분
2001-01-01	2001-01-31	조사원		S2	18.86	261.29	평균저조간격(M.L.W.T) : KM/29 + 6H 12M = 14시간 13분
2001-02-01	2001-02-28	조사원		SA	10.22	131.04	일최고조고(Approx.H.H.W) : 2(HM + HS + HO + HK) = 129.54
2001-03-01	2001-03-31	조사원		N2	7.87	225.46	대조의 평균고조(H.W.O.S.T) : 2(HM + HS) + HO + HK = 123.58
2001-04-01	2001-04-30	조사원		SSA	5.33	237.35	평균고조(H.W.O.M.T) : 2HM + HS + HO + HK = 104.72
2001-05-01	2001-05-31	조사원		K2	5.08	254.39	소조의 평균고조(H.W.O.N.T) : 2HM + HO + HK = 65.06
2001-06-01	2001-06-30	조사원		K1	4.41	137.05	평균(M.S.L) : HM + HS + HO + HK = 64.77
2001-07-01	2001-07-31	조사원		NU2	1.62	220.96	소조의 평균저조(L.W.O.N.T) : 2HS + HO + HK = 43.68
2001-08-01	2001-08-31	조사원		MF	1.76	270.44	평균저조(L.W.O.M.T) : HS + HO + HK = 24.82
2001-09-01	2001-09-30	조사원		O1	1.55	112.15	대조의 평균저조(L.W.O.S.T) : HO + HK = 5.96
2001-10-01	2001-10-31	조사원		T2	1.48	254.70	대조의 Spring Range : 2(HM + HS) = 117.62
2001-11-01	2001-11-30	조사원		MU2	1.29	220.47	소조차 Neap Range : 2(HM - HS) = 42.18
2001-12-01	2001-12-31	조사원		P1	1.28	140.19	평균조차 Mean Range : 2HM = 79.90
2001-02-01	2001-03-02	조사원		MS4	1.15	216.89	합동차 FACTOR : (HO + HK)/(HM + HS) = 0.10
2002-08-16	2002-09-14	조사원		M4	1.05	184.60	
1974-01-01	1975-01-01	조사원		L2	1.03	228.97	
2002-04-01	2002-04-30	조사원		2N2	0.81	195.13	

추가 삭제

TIDAS II Version 0.1.9

호출/분석 자료관리 자료출력 고조정보 시스템 도움말 종료

자료관리 > 조위관리 > 자료수정 > 원시조위수정

원시조위수정

검조소 종류 표준검조소
 기간 2002년 09월

저장 닫기 도움말

현재 선택된 Point 개수 = 0 편집된 Point 개수 = 0 일괄 변경 적용

대기중...

TIDAS II

거문도검조소 - 원시조위

현재 선택된 Point 개수 = 0 편집된 Point 개수 = 0 일괄 변경 적용

대기중...

- 1시간조위생성
- 1시간조위예측생성
- 매월조위생성
- 원시조위수정
- 1시간조위수정
- 1시간조위극치수정
- 1시간조위예측극치수정
- 1시간조위일괄수정
- 매월조위수정
- 그래프 보기

II.

NOW & FUTURE PLANS



Traditional Observation

- Tide
- Tidal current
- Ocean current
- Sea temp.
- Salinity, etc.



New observations

- Surface movement
- Storm surge
- Tsunami
- Atmos. parameters
- Cluster movement with GPS, etc.

**Water Level
Measurement System**



**National Oceanographic
Observation System**

**Physical Parameters
Observation System**

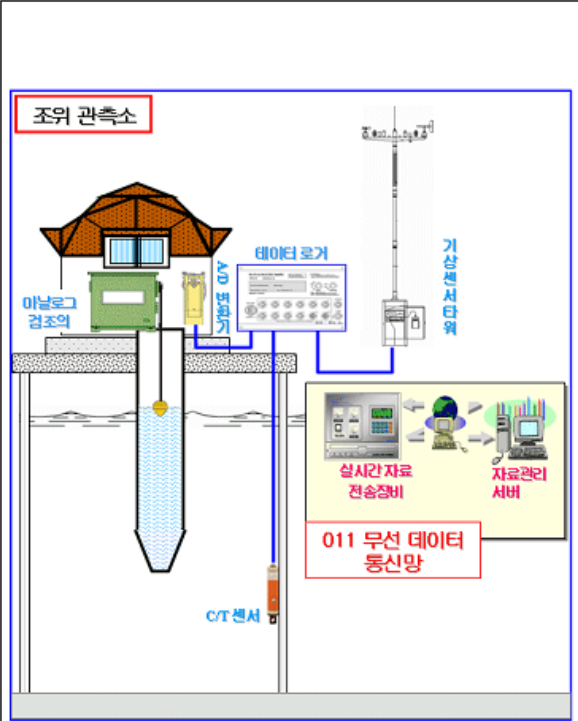


**Storm Surge
Monitoring System**



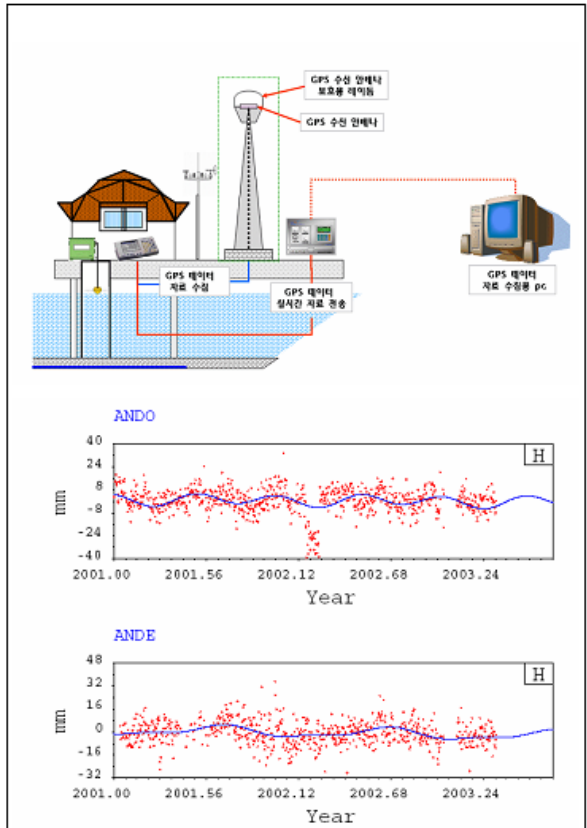
Tidal station operation

- Purpose
determine coastal marine boundaries by basic tidal datums
support for tsunami and storm surge warning systems, climate monitoring, coastal processes and tectonic research.
- Content
A tidal station (32 places → 38 places)
real-time observation equipment (a tide, C/T, weather, etc) installation



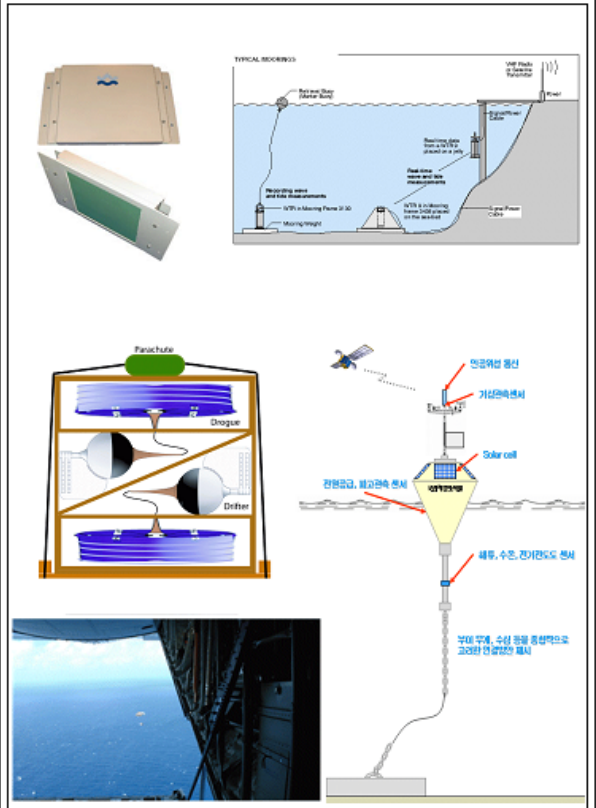
National datum level monitoring

- Purpose
Correct analysis of a rise in sea level to have obeyed global warming
- Content
Operating with minuteness GPS and a tidal gauge

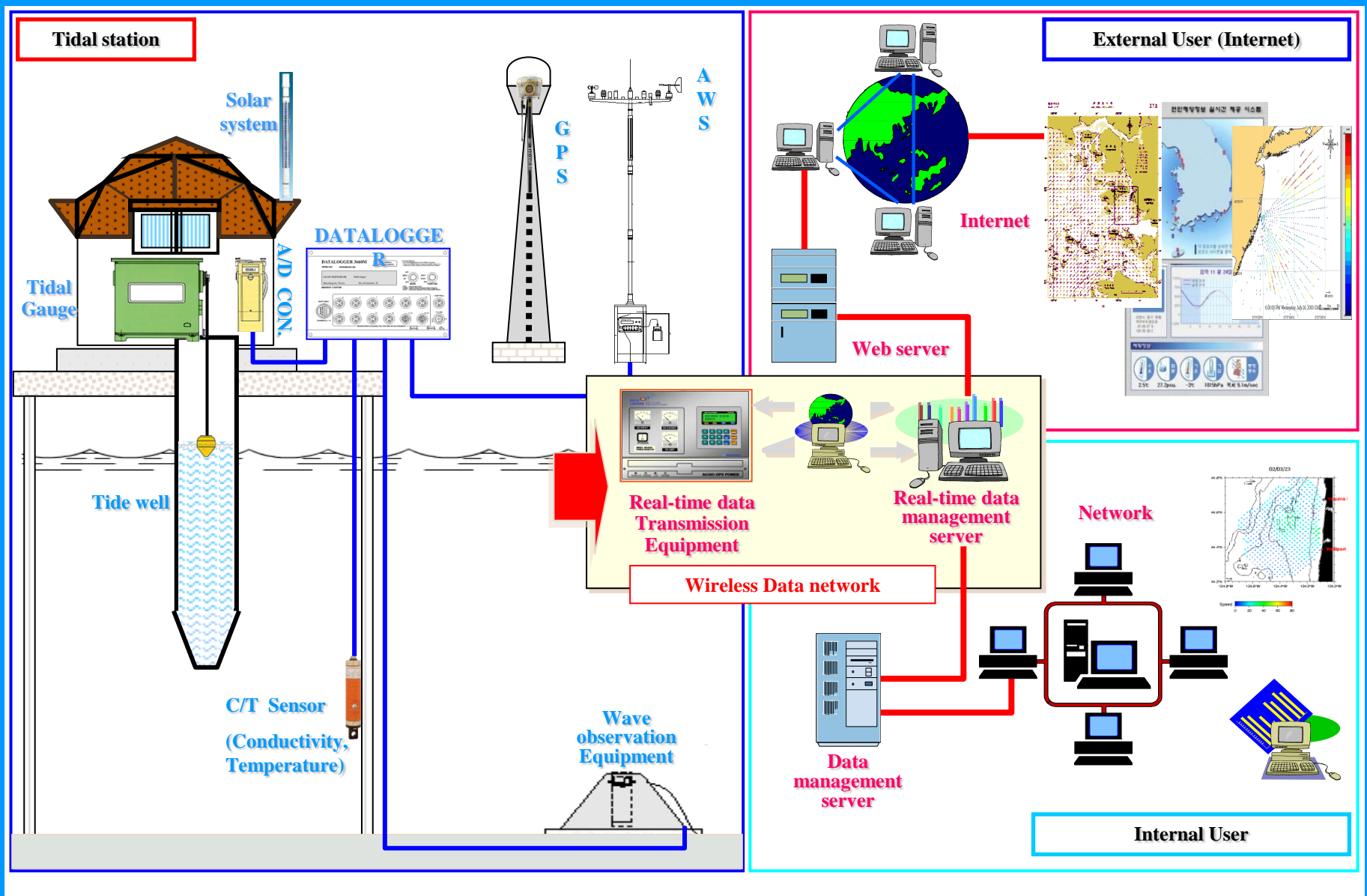


Real-time coastal risk warning system

- Purpose
Monitoring for storm surge detection
- Content
Microwave tide gauge installation
Ocean monitoring buoy installation
Drift buoy installation
Storm surge monitoring data process and analysis system development



Configuration of Tidal Observation and Service

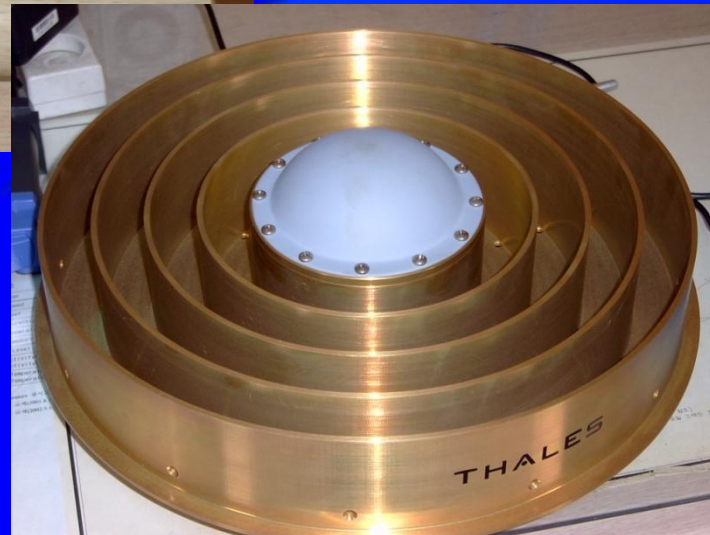


GPS Monitoring



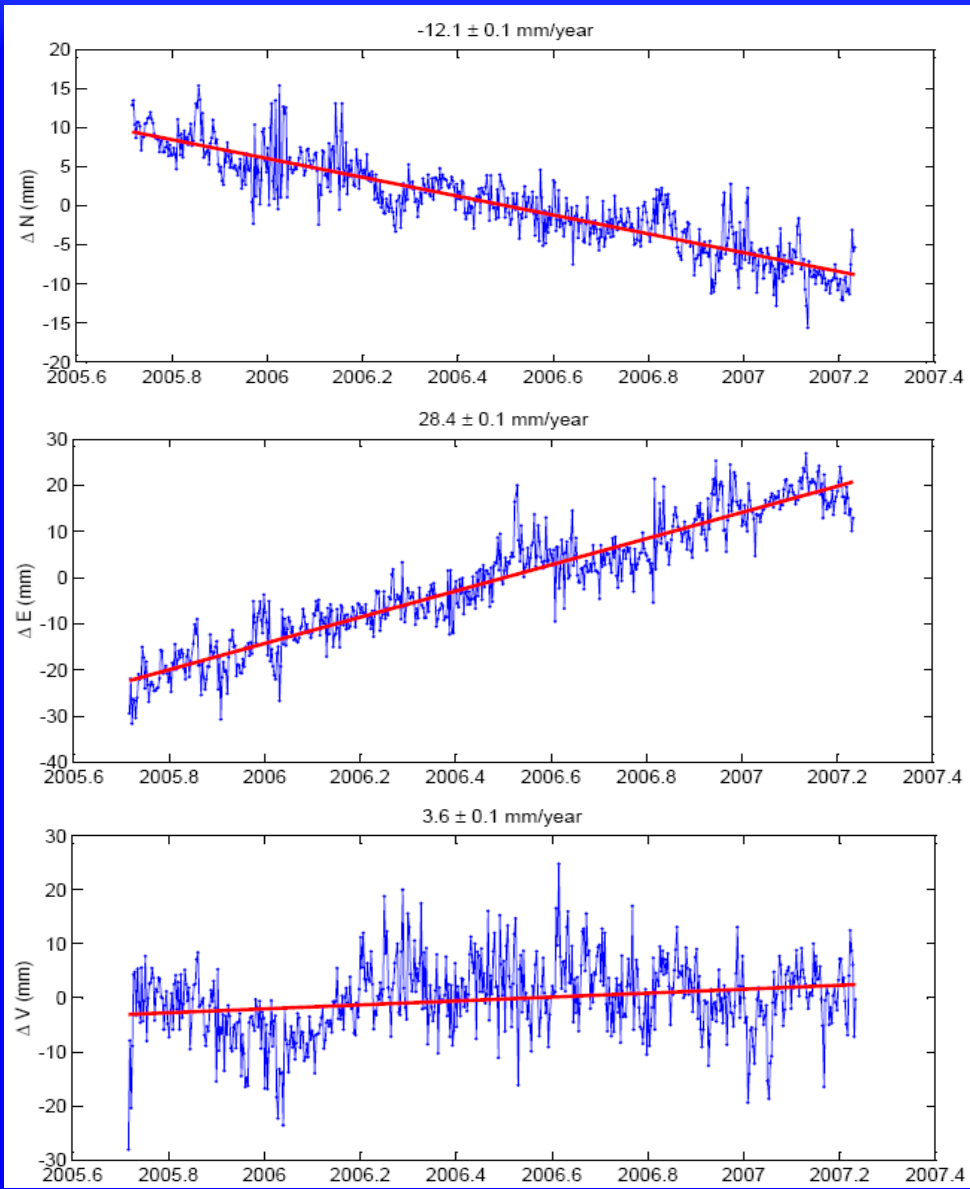
GPS Station : Incheon ('05)
Jeju('06)
Mokpo, Busan, Sokcho('07)
Tongyeong, Ulleungdo, Younggwang('08)

GPS Equipments at ICNW



Antenna Setup at ICNW

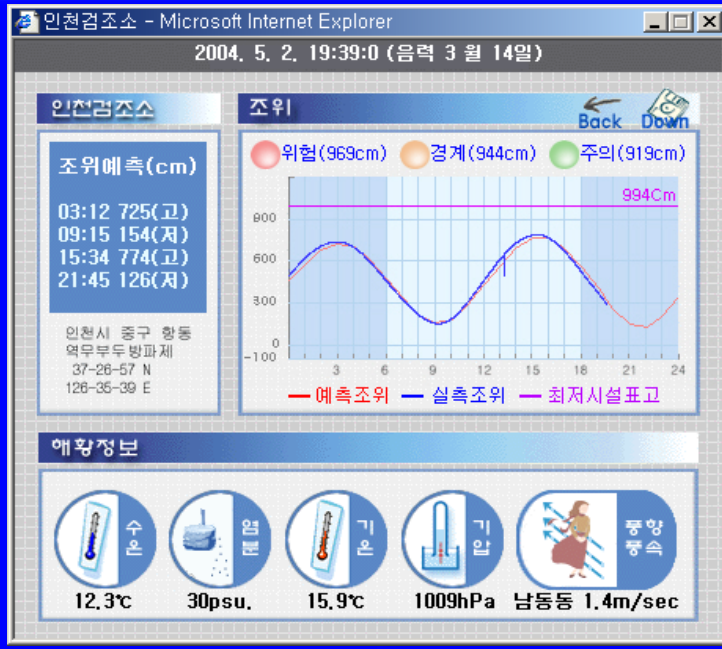




Incheon Tidal station

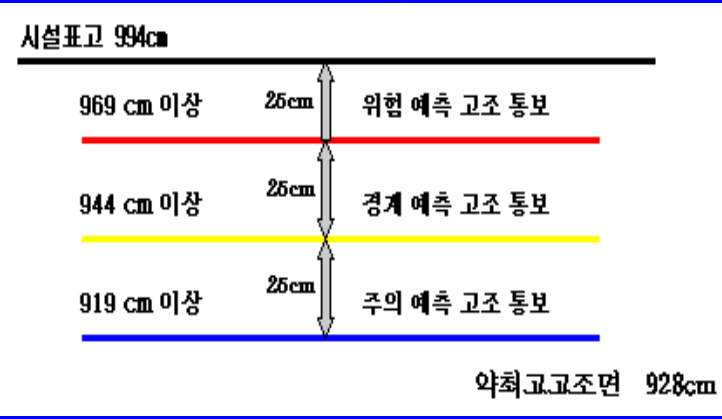
- North direction : -12.1 mm/yr
- East direction : 28.4 mm/yr
- Vertical direction : 3.6 mm/yr

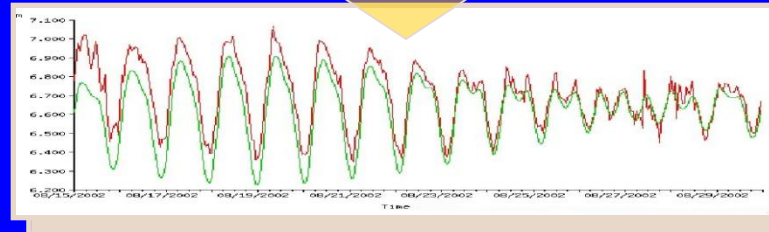
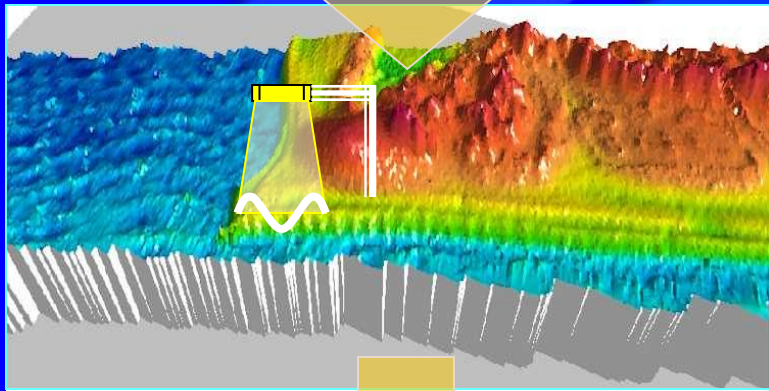
Real-time coastal risk warning system



Providing sea level information

- Providing real-time data by internet based on a region where real-time information instrument are installed
- Displaying water levels with three stages, such as **Notice**, **Caution** and **Hazard**
- Heights of each stages are determined by the lowest elevation for structures with vertical velocity of tide in the regions. If there is no information on the elevation, the Approx. Highest High Water Level is used.





Microwave Tide Gauge system

○ Introduction

- Short-term observation to calculate flood heights for storm prediction and warning
- Data acquisition where the install of pressure tide gauges is difficult

○ Application plan

- Calculation of regional land elevation based on short-term sea surface observation in danger area
- Selection of sea surface monitoring site and tidal prediction using a correlation coefficient with a standard tidal station
- Provide basic information for coastline survey

THANK YOU

