Implementation of WIGOS related programs in Indonesia

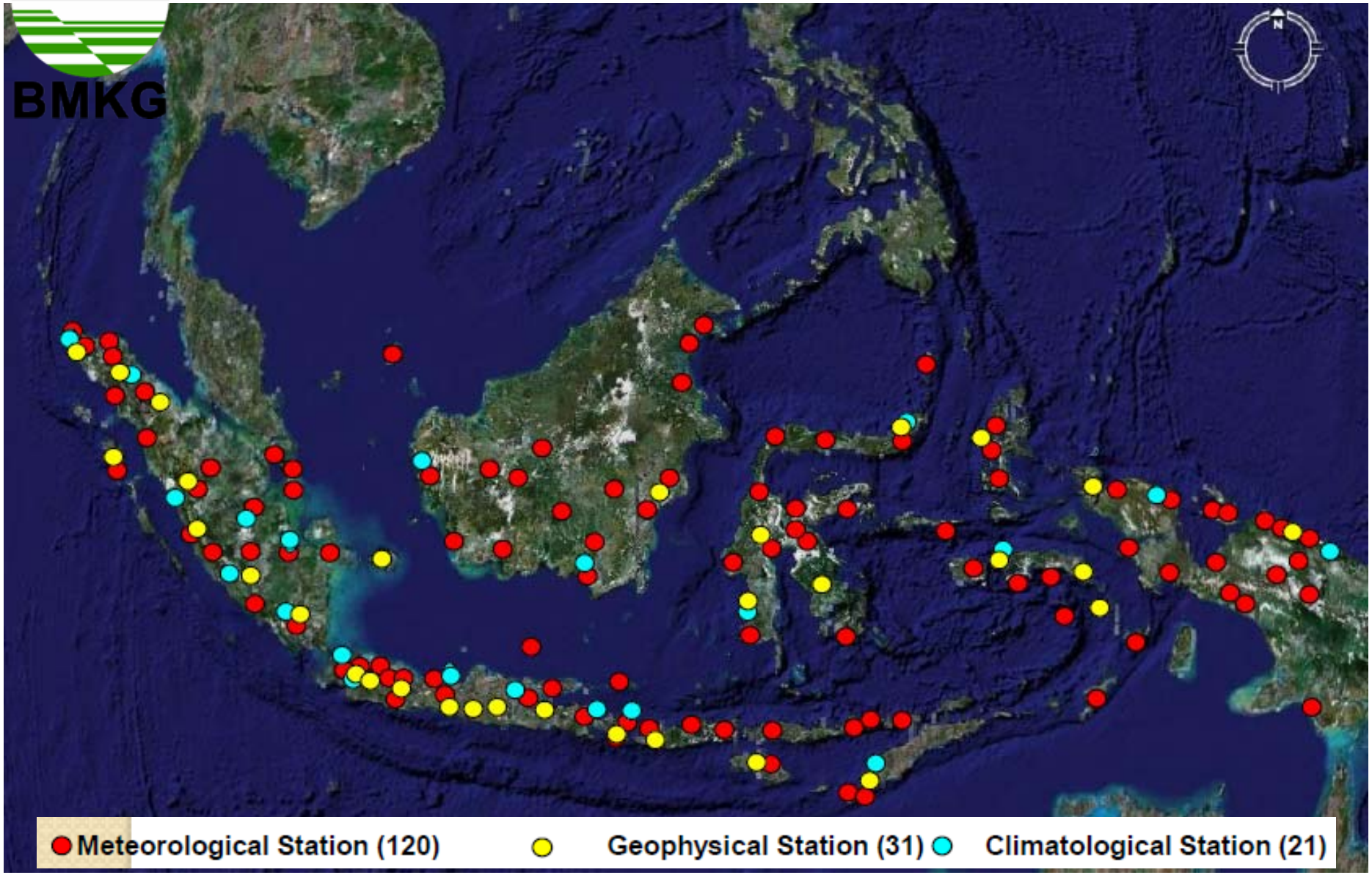
By :

Indonesia Agency for Meteorology Climatology and Geophysics (BMKG)

Preparatory Meeting for “WMO Joint RA-II/RA-V Workshop on WIGOS for DRR”
Jakarta / 21-23 April 2015

Surface-based Observing system

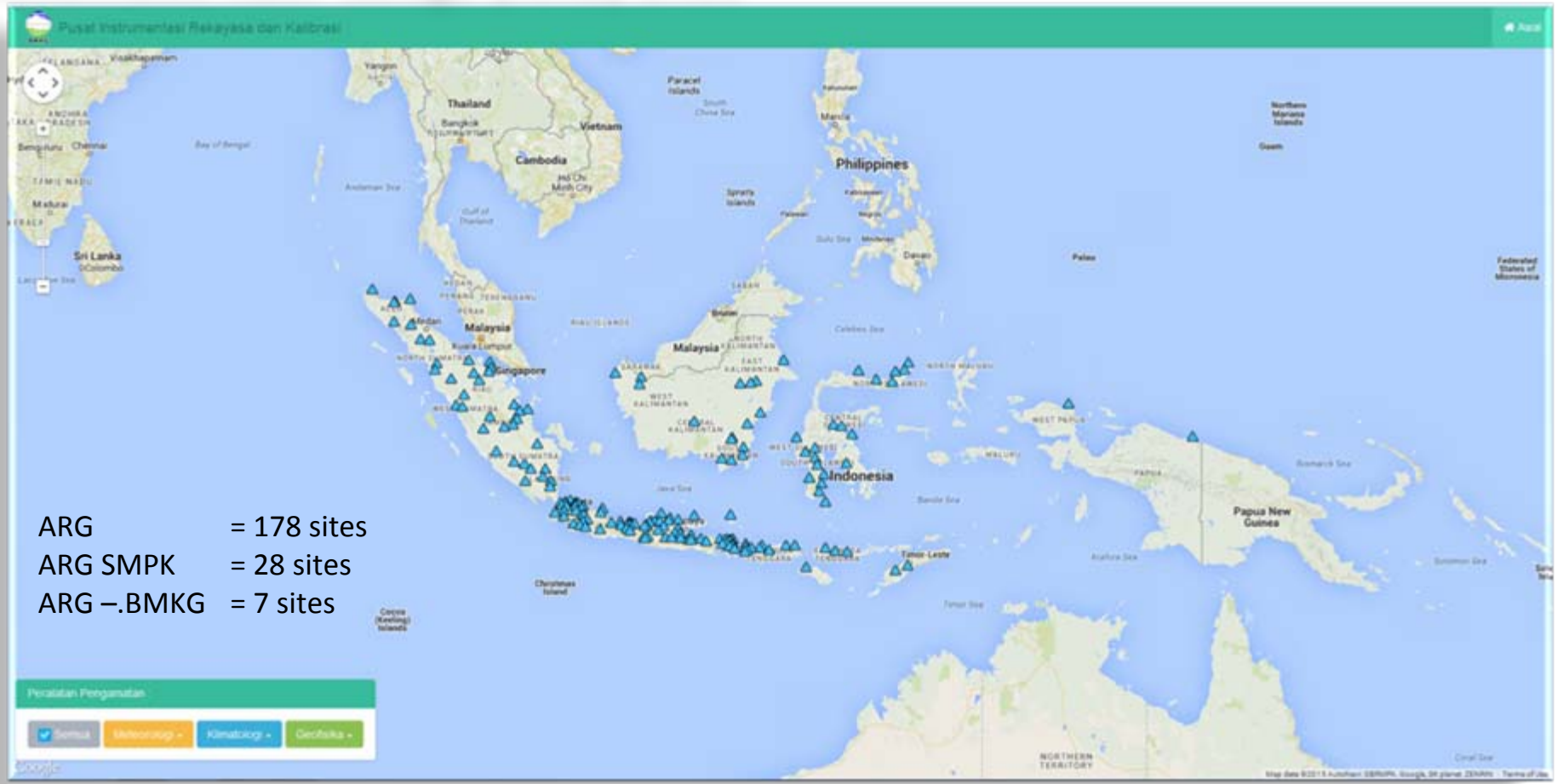
BMKG Surface Observation Network



DISTRIBUTION OF AUTOMATIC WEATHER STATIONS / AWS (217 SITES)

Weather parameters measured : wind, air-pressure, relative humidity, temperature, rainfall, global solar radiation

Automatic Rain Gauge (ARG) Sites



Main Parts of ARG and AWS

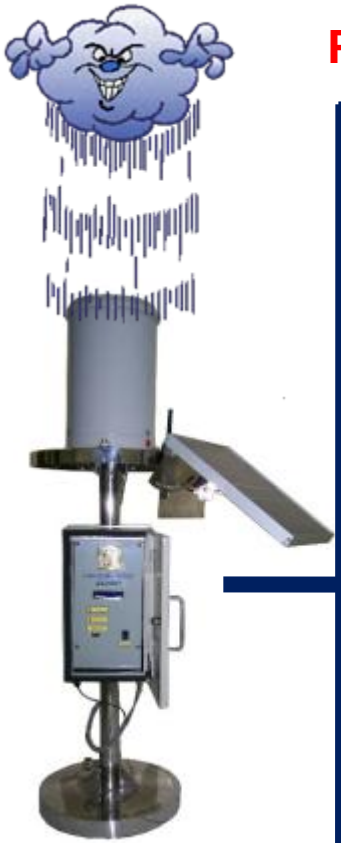
AWS &Rain Sensor

Data Logger

Modem Communication

Power supply for every single parts

ARG and AWS Data Communications



ARG's
AWS's

RS 232

Modem

GPRS/SMS/FTP

Web

Mobile

HandPhone

Server (aws-center)

RS 485

USB

Notebook

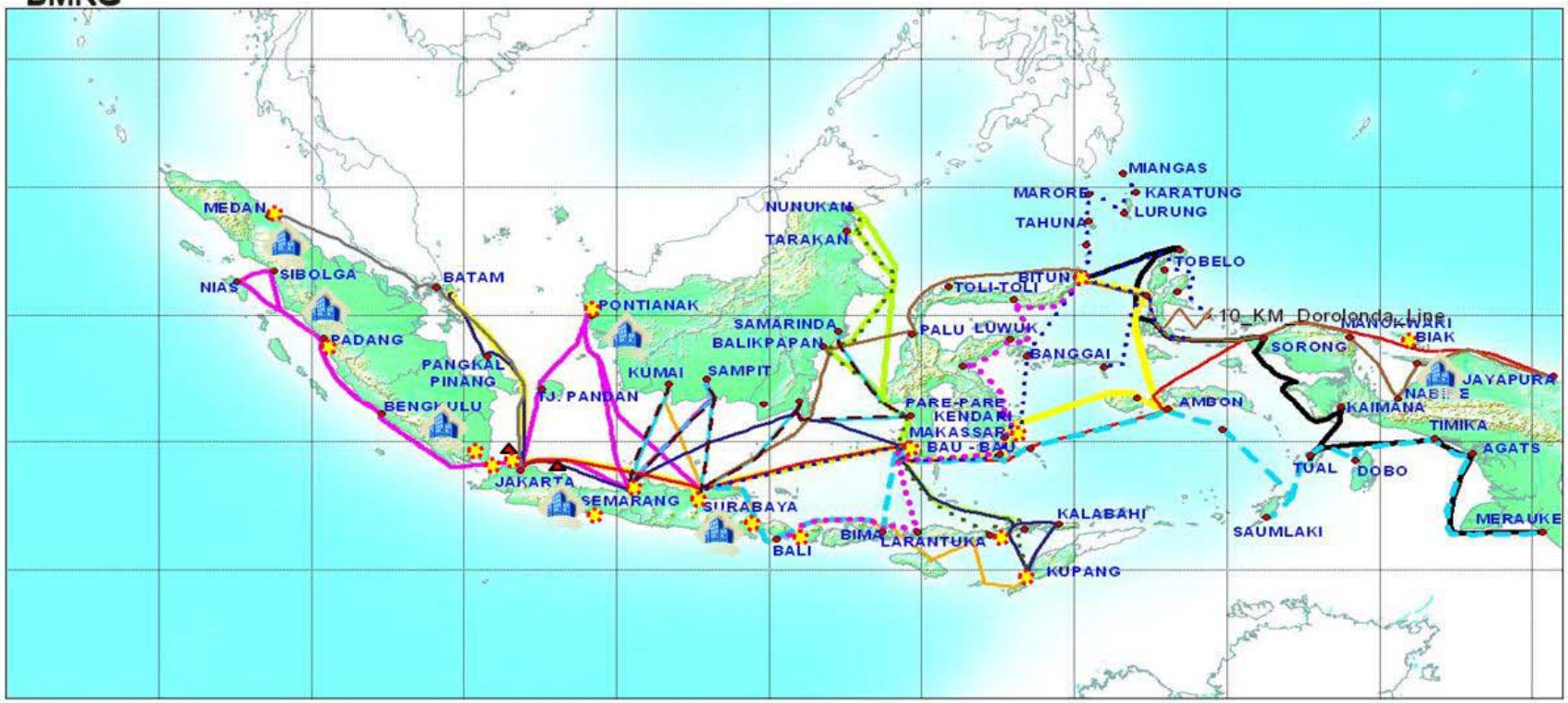
Web-based Monitoring

Internet

Marine Observation System BMKG

(Marine Met. Stations, VOS, Offshore Oil-Platform/Rig, Ports)

BMKG



Stasiun Meteorologi Maritim (13)

AWS Platform/ Rig (2)

AWS Maritim/Pelabuhan (16)

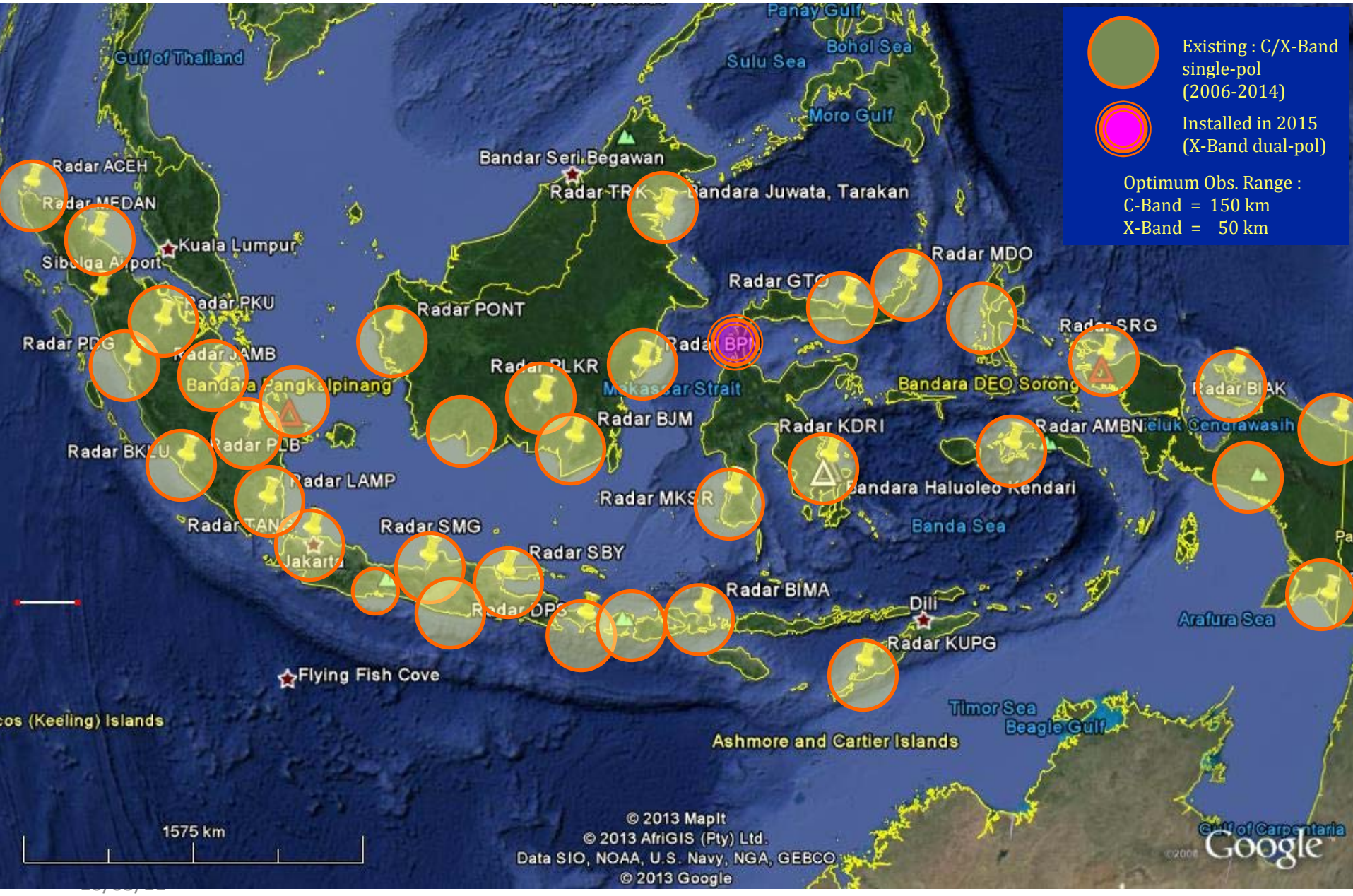
AWS Kapal/ VOS (15)

- 01_KM_Dempo_Line
- 02_KM_Lawit_Line
- 03_KM_Awu_Line
- 01_KM_Sangiang_Lane
- 02_KM_Tilongkabila_Lane
- 04_KM_Tidar_Line
- 05_KM_Tatamailau_Line
- 06_KM_Bukitraya_Line
- 03_KM_Kelimutu_Line
- 04_KM_Bukit Siguntang_Lane
- 07_KM_Sirimau_Line
- 08_KM_Kelud_Line
- 09_KM_Lambelu_Line
- 10_KM_Dorolonda_Line
- 05_KM_Binaiya_Lane

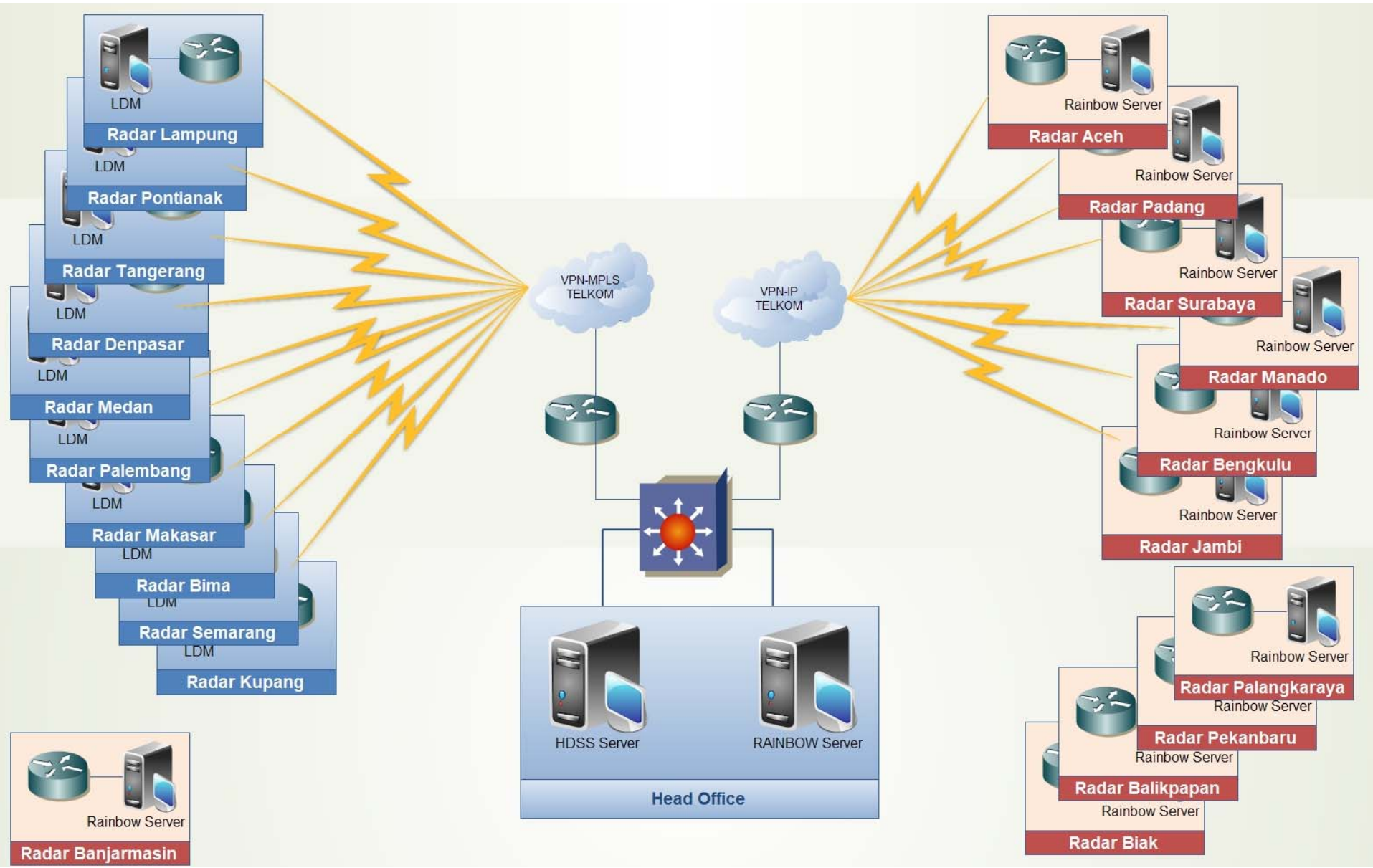
Voluntary Observing Ships
(AWS on-board commercial ships)

http://maritim.bmkg.go.id/index.php/aws

Existing BMKG Doppler Weather Radars (2006–2014)



Radar Data Transmission to BMKG - Head office



BMKG Centralized Radar Data Processing (HDSS System)

Centralized Radar Data Server

WEB-DISPLAY

Radar Data QC

NetCDF

Storm Tracking Attributes

NetCDF

Formatting

Clean up Polar Processing

NetCDF

3-D Mosaic

MAPLE QPF

Products & Server

FFPA

VPR

QPEA

Data Coversion

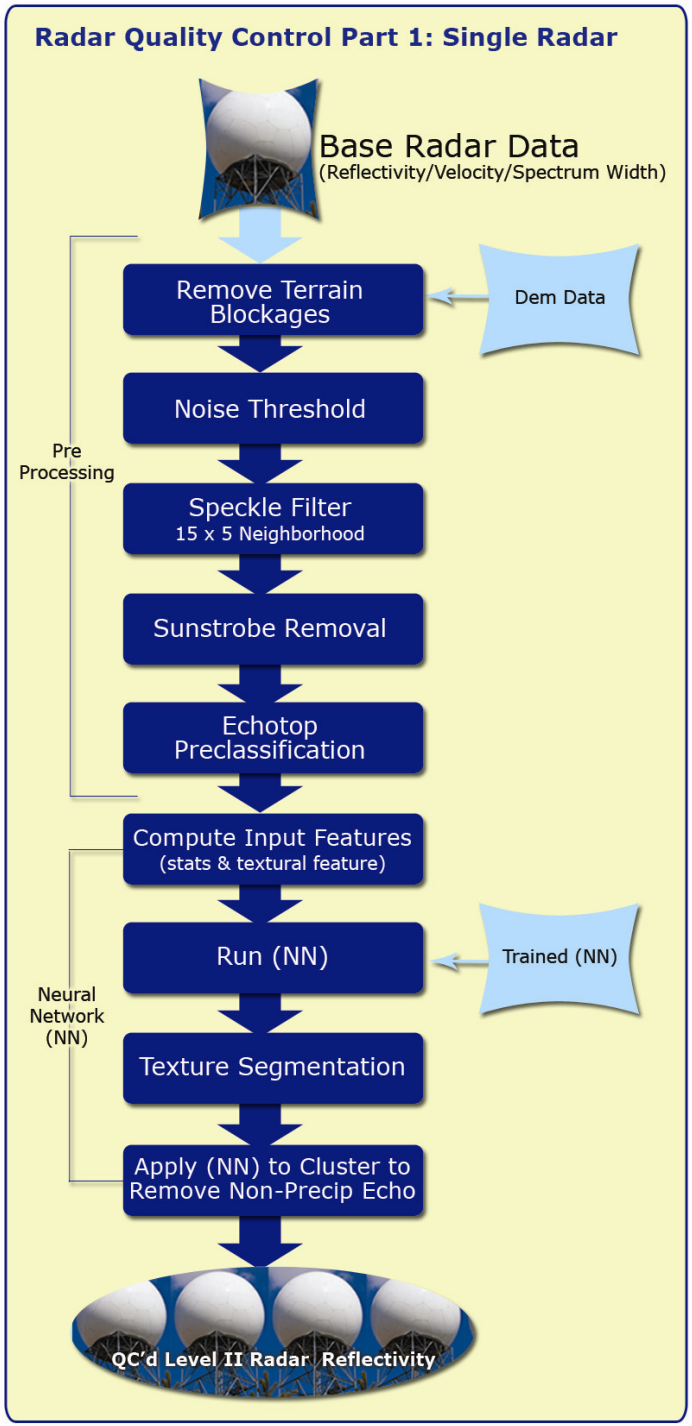
NWP, AWS, Rain gauges, Satellite processing

Satellite, NWP, AWS, Rain Gauges

Planned for next improvement

FFPA : Flash-Flood Prediction Area

QPEA : Quantitative Precipitation Estimate Accumulation



Radar Data QC

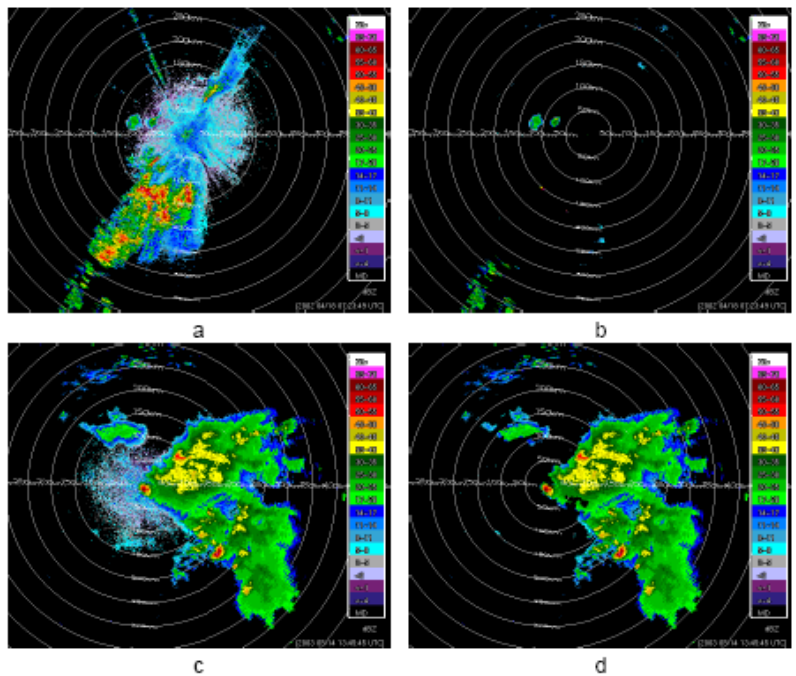
Developed at NSSL

Apply to each radar

Fully automated in real-time

NN

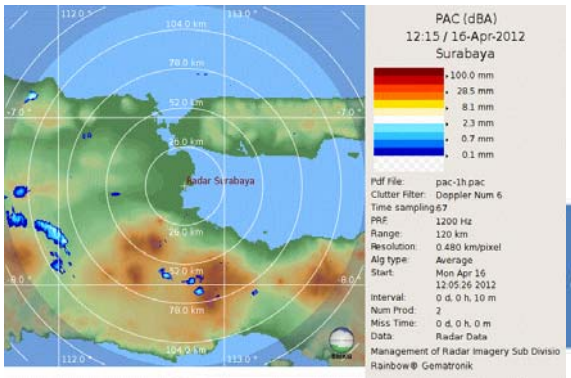
- **Textural feature**
- **Horizontal/vertical gradients**
- **All moments**
- **Mitigates non-precip echo**
- **Removes artifacts**



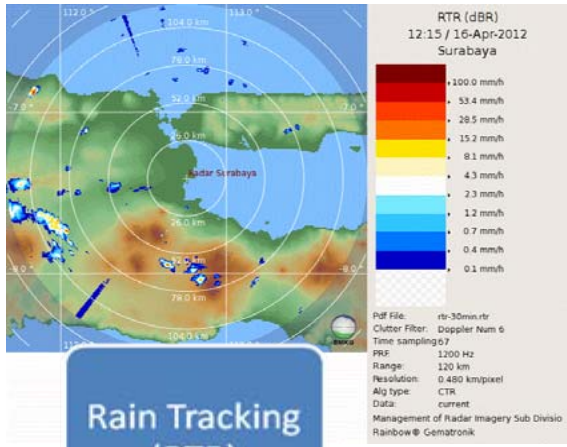
Nowcasting product 1-hour up to 4-hours ahead (MAPLE forecast)

MAPLE (McGill Algorithm for Precipitation Nowcasting Using Lagrangian Extrapolation) : An algorithm for prediction of the movement of radar echoes and rainfall accumulation. MAPLE examines a time sequence of up to the past 2-hours of radar mosaic data to determine the movement and evolution of storms and their radar echoes. The algorithm was developed by McGill University – Canada.

Nowcasting products from BMKG Doppler weather radars

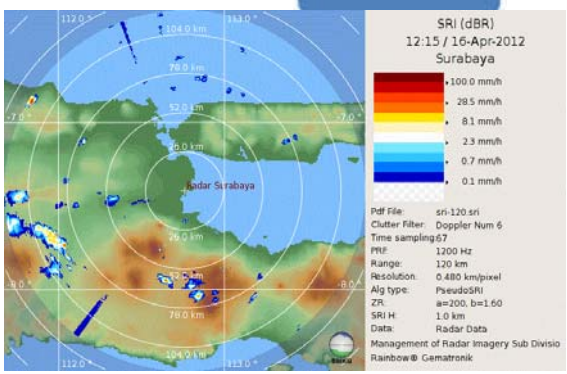


Precipitation Accumulation (PAC)



Rain Tracking (RTR)

Surface Rain Indicator (SRI)

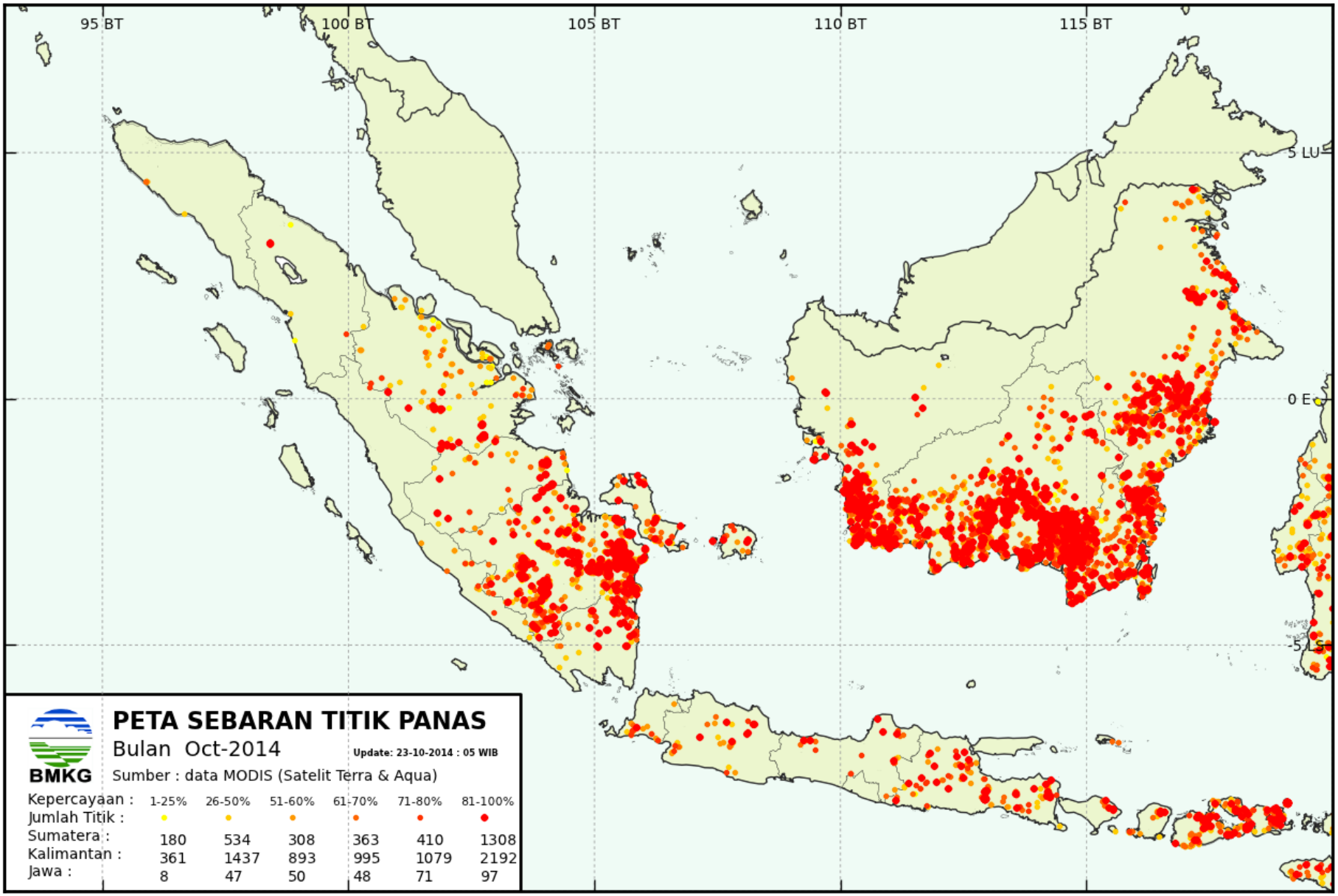


Mapple Algorithm

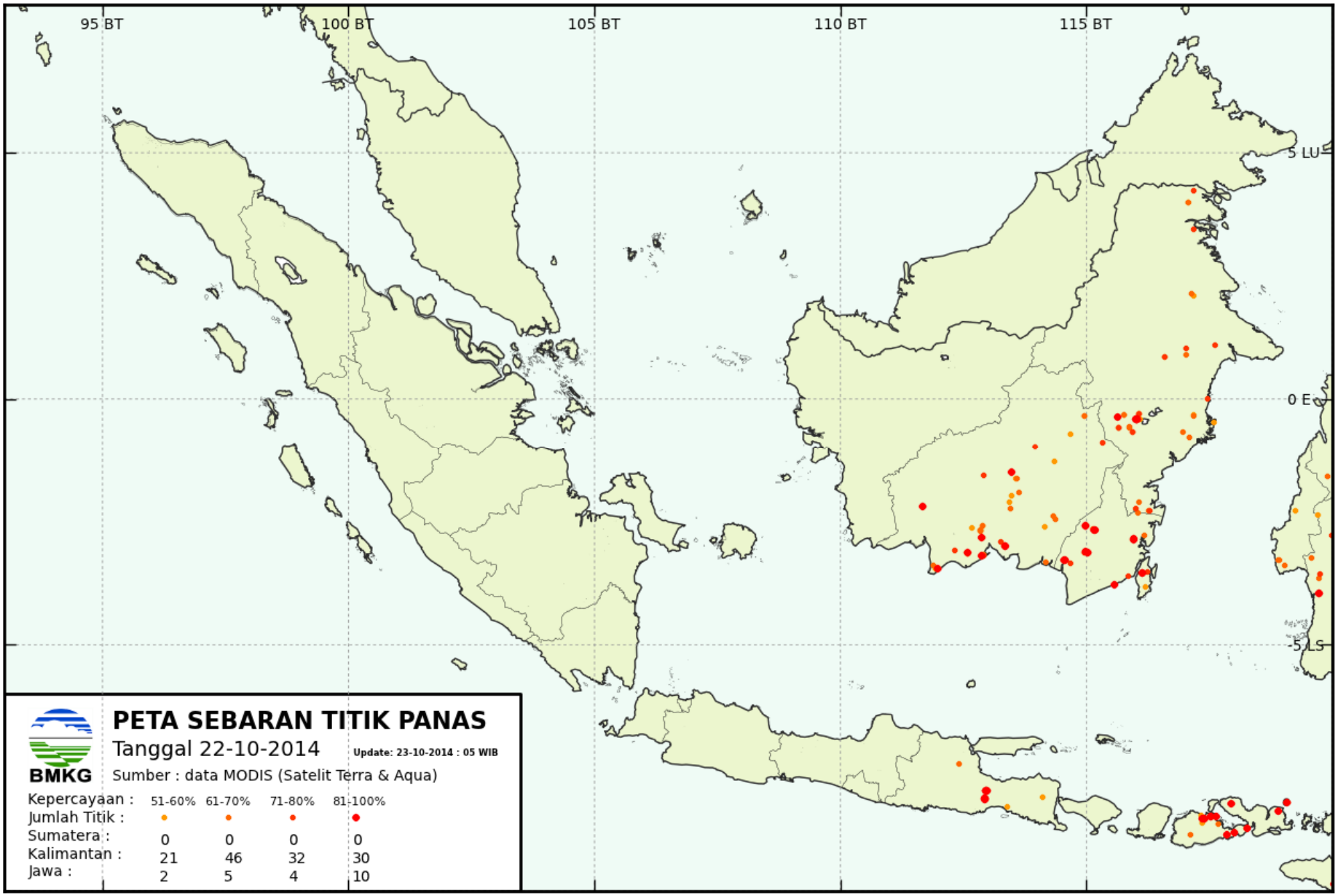
Nowcasting Products (Radar Imagery)

Satellite-based Products

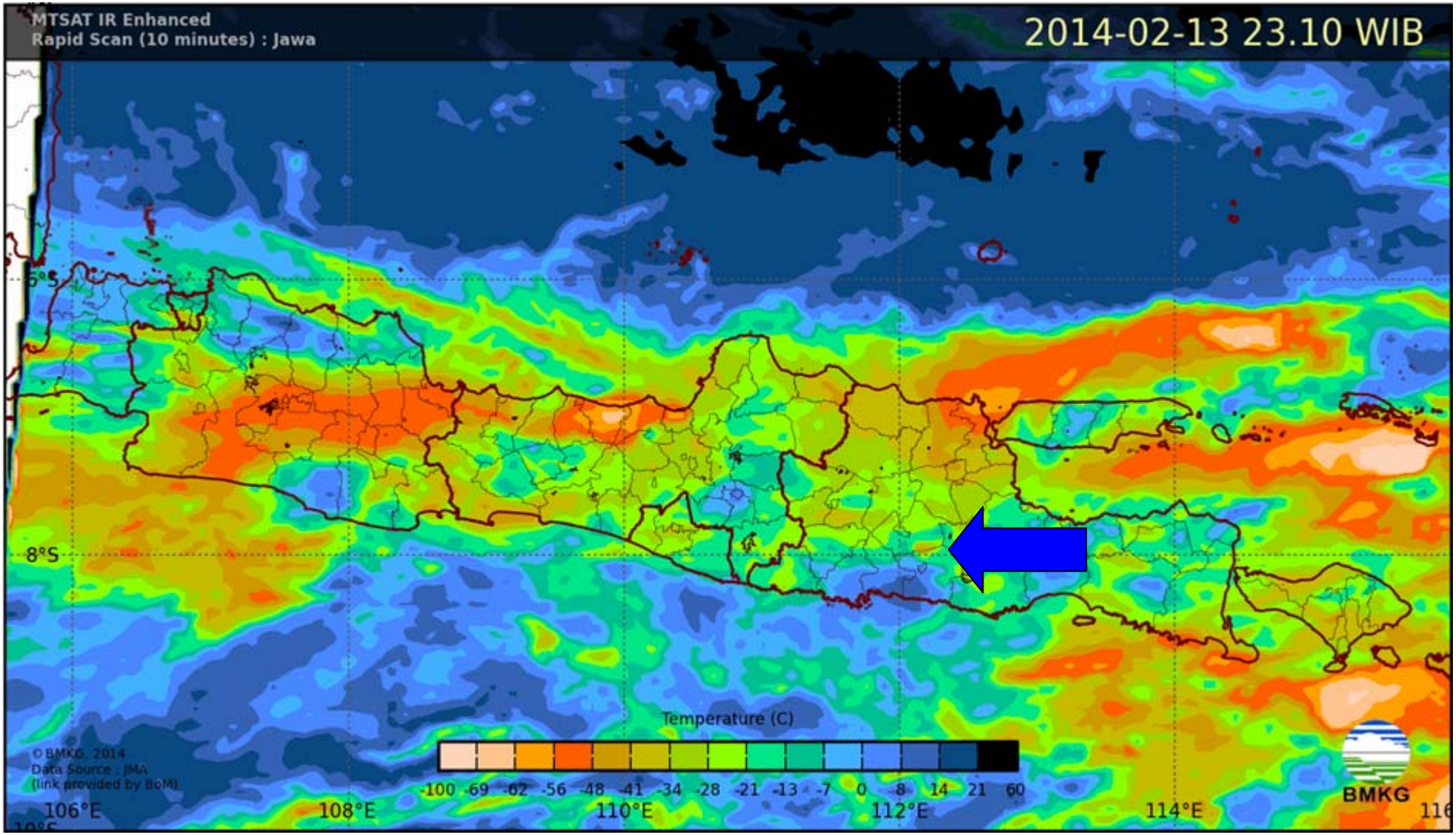
Hotspot / Firespot Detection for Forest fire monitoring : Cumulative detected hotspot for October 2014 (as of 23 Oct. 2014)



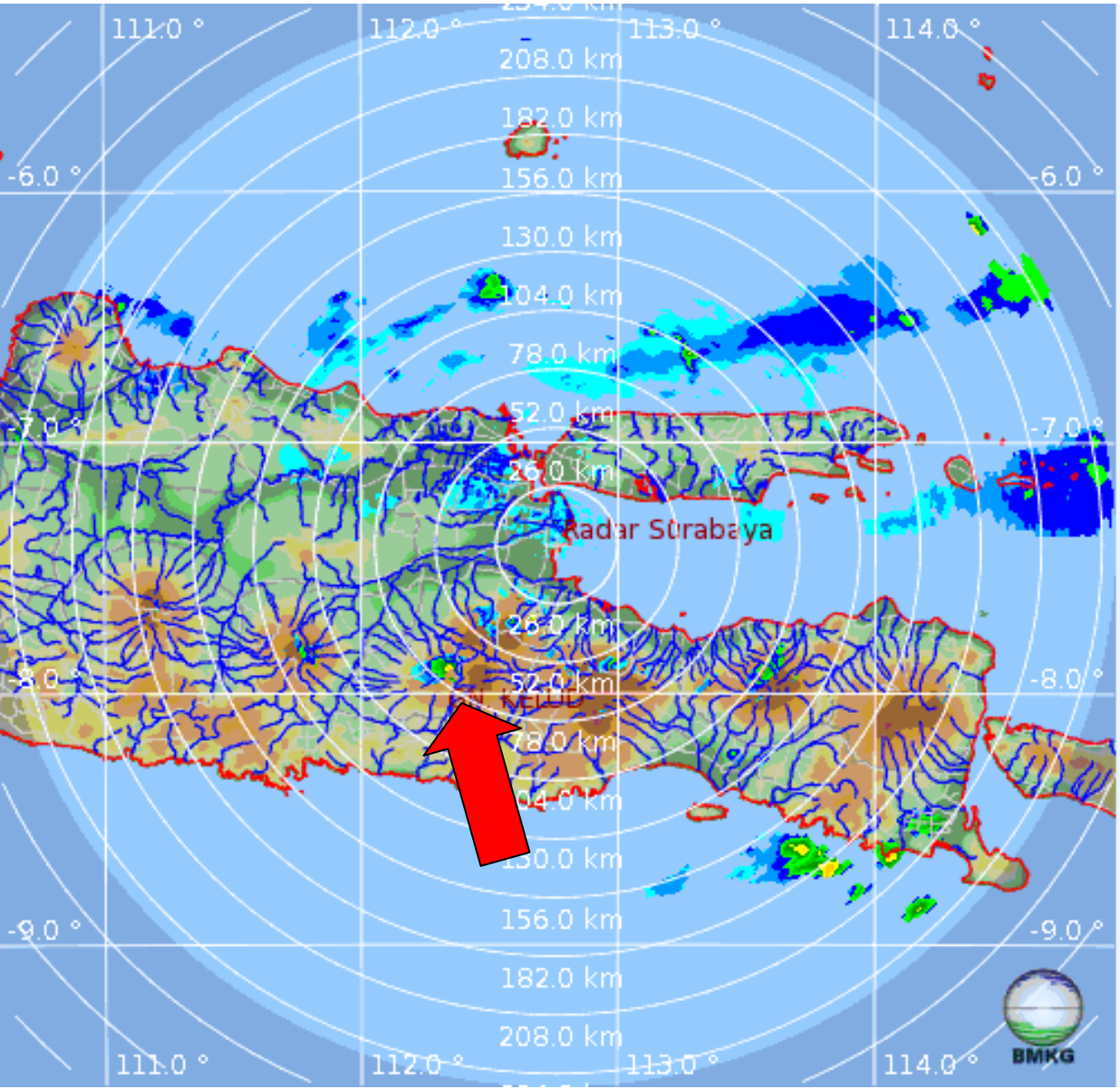
Daily Hotspot / Firespot Detection : 23 Oct. 2014



MTSAT Satellite Imagery : Eruption of G. Kelud 13-14 Feb. 2014
(10 minutes interval/rapid-scan)



Surabaya Radar Imagery : Eruption of G. Kelud 13-14 Feb. 2014 (10 minutes interval/rapid-scan)



CMAX (dBZ)
16:12 / 13-Feb-2014
Surabaya

75.0 dBZ
65.0 dBZ
55.0 dBZ
45.0 dBZ
35.0 dBZ
25.0 dBZ
15.0 dBZ
5.0 dBZ

Pdf File:	CMAX_ANALISIS.cmax
Clutter Filter:	Doppler Num 6
Time sampling:	26
PRF:	625 Hz
Range:	240 km
Height:	0.000 kmto 20.000 km
Hor Res:	0.960 km/pixel
Data:	Radar Data

Management of Radar Imagery Sub Divisio
Rainbow® Gematronik

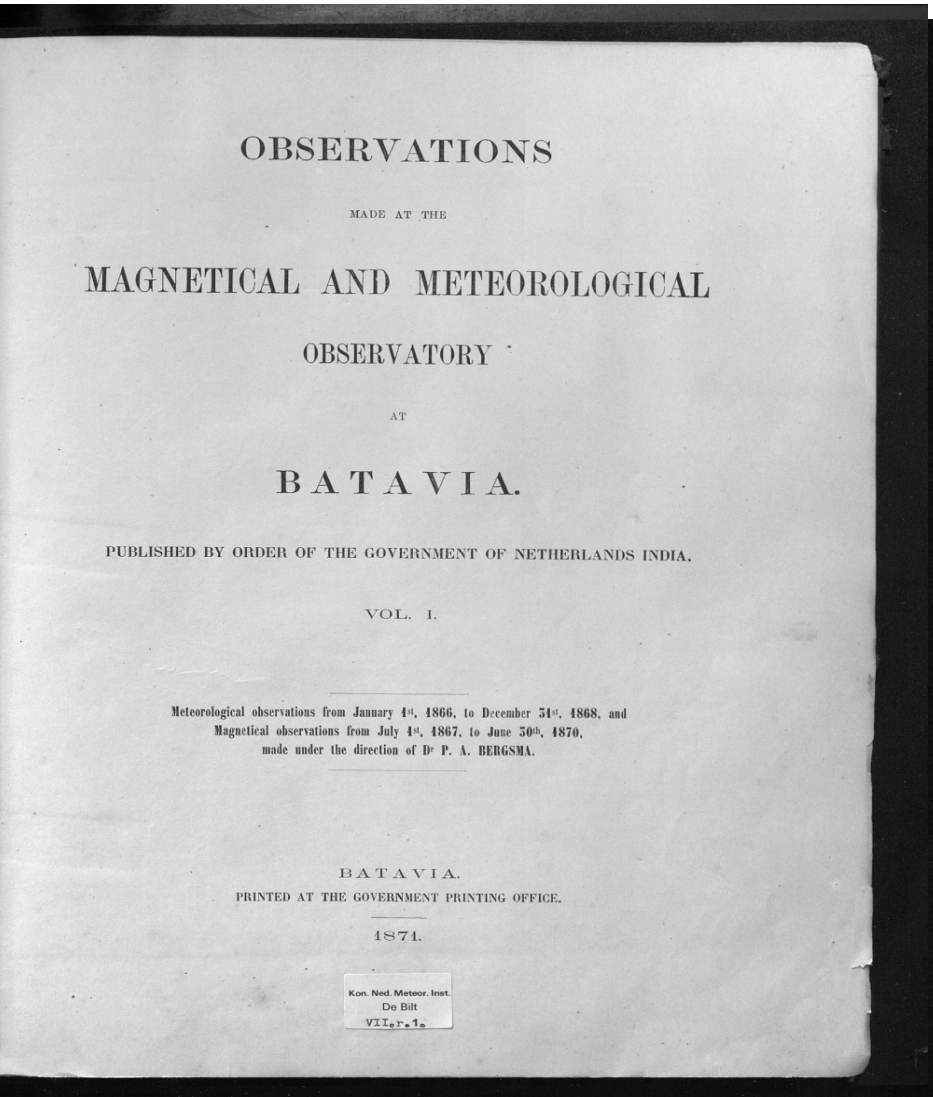
Data Rescue
and Database Management

DiDaH

- DiDaH (Digitisasi Data Historis) was a cooperation project of BMKG-KNMI (2009-2014)
- DiDaH was aiming at the digitization of historical Indonesian climate data that was recorded in the period 1845 – 1970 and more recent BMKG climate data from the period 1970 – present.
- All climate data time series that are newly digitized or obtained from observation have to be checked for validity and possibly corrected for known defects. For the historical data, that was digitized in the DiDaH framework, this QC, validation and correction was done at KNMI.
- For the BMKG non-digitized data from 1970 – 2012 will be digitized and entered in the future into the operational SACA&D system at BMKG (QC, validation and correction will be done by BMKG).

List of Scanning daily data of Batavia

- Daily Data Batavia some parameters from 1866 – 1997 and magnetic data



OBSERVATIONS

MADE AT THE

MAGNETICAL AND METEOROLOGICAL

OBSERVATORY

AT

BATAVIA.

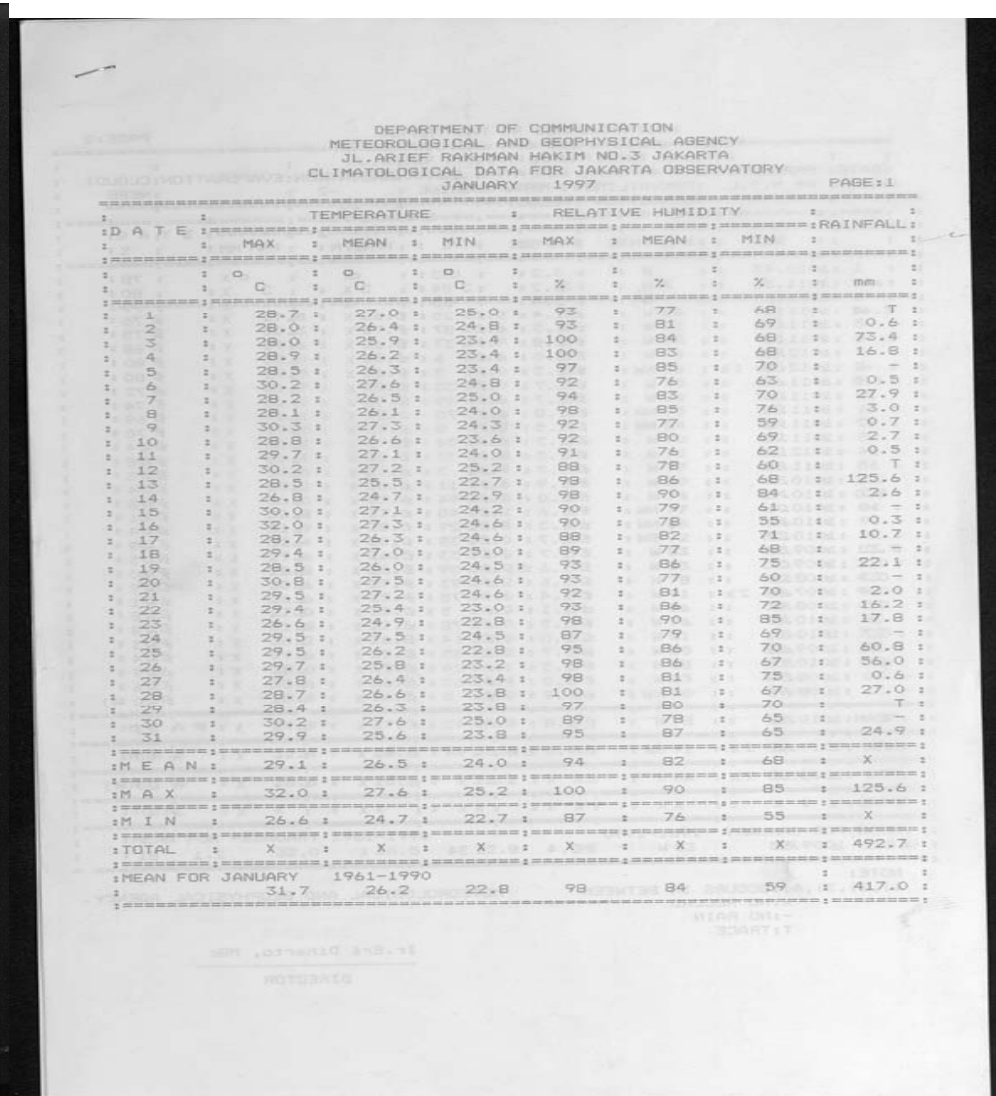
PUBLISHED BY ORDER OF THE GOVERNMENT OF NETHERLANDS INDIA.

VOL. I.

Meteorological observations from January 1st, 1866, to December 31st, 1868, and Magnetical observations from July 1st, 1867, to June 30th, 1870, made under the direction of Dr P. A. BERGSMA.

BATAVIA.
PRINTED AT THE GOVERNMENT PRINTING OFFICE.

1871.

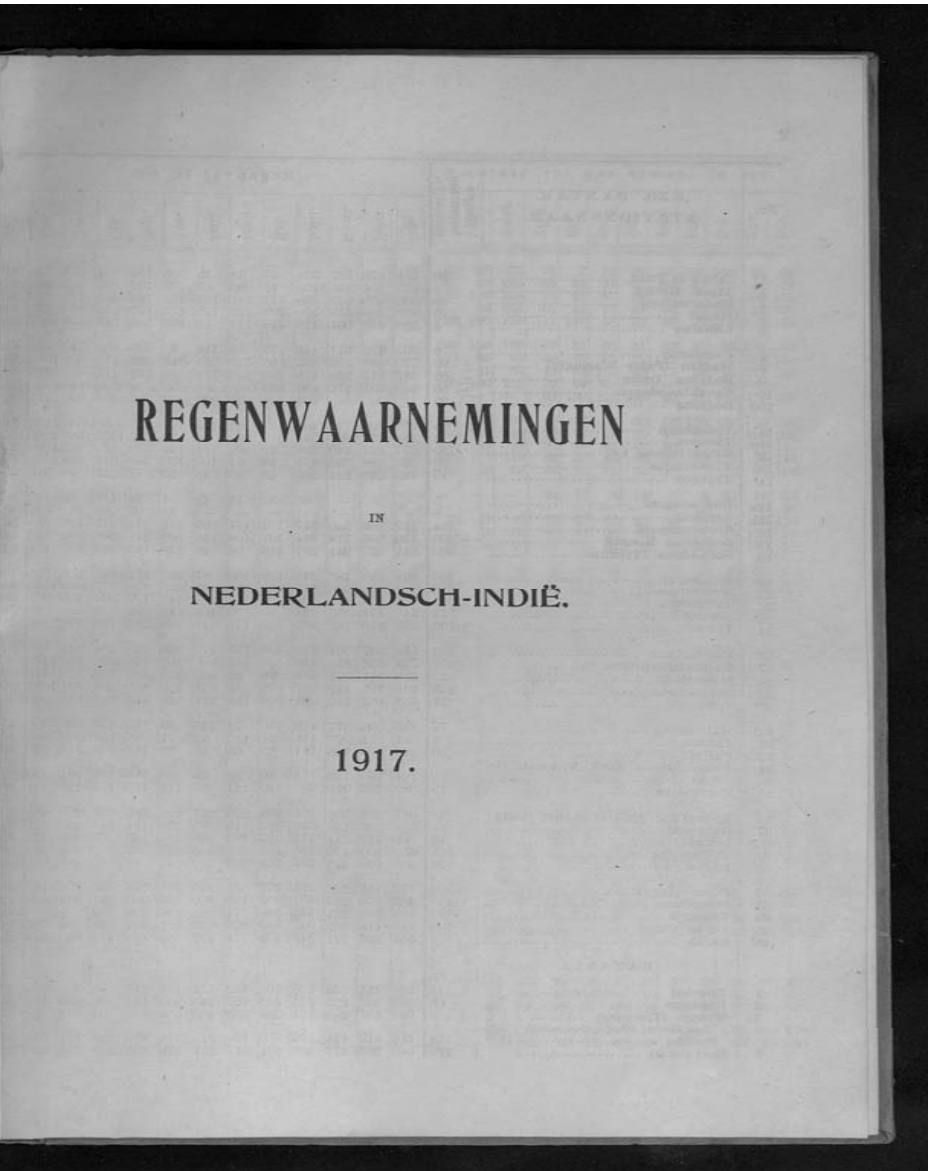


DEPARTMENT OF COMMUNICATION
METEOROLOGICAL AND GEOPHYSICAL AGENCY
JL.ARIEF RAKHMAN HAKIM NO.3 JAKARTA
CLIMATOLOGICAL DATA FOR JAKARTA OBSERVATORY
JANUARY 1997

PAGE:1

DATE	TEMPERATURE MAX	TEMPERATURE MEAN	TEMPERATURE MIN	RELATIVE HUMIDITY MAX	RELATIVE HUMIDITY MEAN	RELATIVE HUMIDITY MIN	RAINFALL
	C	C	C	%	%	%	mm
1	28.7	27.0	25.0	93	77	48	T
2	28.0	26.4	24.8	93	81	69	0.6
3	28.0	25.9	23.4	100	84	68	73.4
4	28.9	26.2	23.4	100	83	68	16.8
5	28.5	26.3	23.4	97	85	70	-
6	30.2	27.6	24.8	92	76	63	0.5
7	28.2	26.5	25.0	94	83	70	27.9
8	28.1	26.1	24.0	98	85	76	3.0
9	30.3	27.3	24.3	92	77	59	0.7
10	28.8	26.6	23.6	92	80	69	2.7
11	29.7	27.1	24.0	91	76	62	0.5
12	30.2	27.2	25.2	88	78	60	T
13	28.5	25.5	22.7	98	86	68	125.6
14	26.8	24.7	22.9	98	90	84	2.6
15	30.0	27.1	24.2	90	79	61	-
16	32.0	27.3	24.6	90	78	55	0.3
17	28.7	26.3	24.6	88	82	71	10.7
18	29.4	27.0	25.0	89	77	68	-
19	28.5	26.0	24.5	93	86	75	22.1
20	30.8	27.5	24.6	93	77	60	-
21	29.5	27.2	24.6	92	81	70	2.0
22	29.4	25.4	23.0	93	86	72	16.2
23	26.6	24.9	22.8	98	90	85	17.8
24	29.5	27.5	24.5	87	79	69	-
25	29.5	26.2	22.8	95	86	70	60.8
26	29.7	25.8	23.2	98	86	67	56.0
27	27.8	26.4	23.4	98	81	75	0.6
28	28.7	26.6	23.8	100	81	67	27.0
29	28.4	26.3	23.8	97	80	70	T
30	30.2	27.6	25.0	89	78	65	-
31	29.9	25.6	23.8	95	87	65	24.9
MEAN	29.1	26.5	24.0	94	82	68	X
MAX	32.0	27.6	25.2	100	90	85	125.6
MIN	26.6	24.7	22.7	87	76	55	X
TOTAL	X	X	X	X	X	X	492.7
MEAN FOR JANUARY 1961-1990	31.7	26.2	22.8	98	84	59	417.0

Scanning of Monthly Data of Indonesia from 1917 - 1965

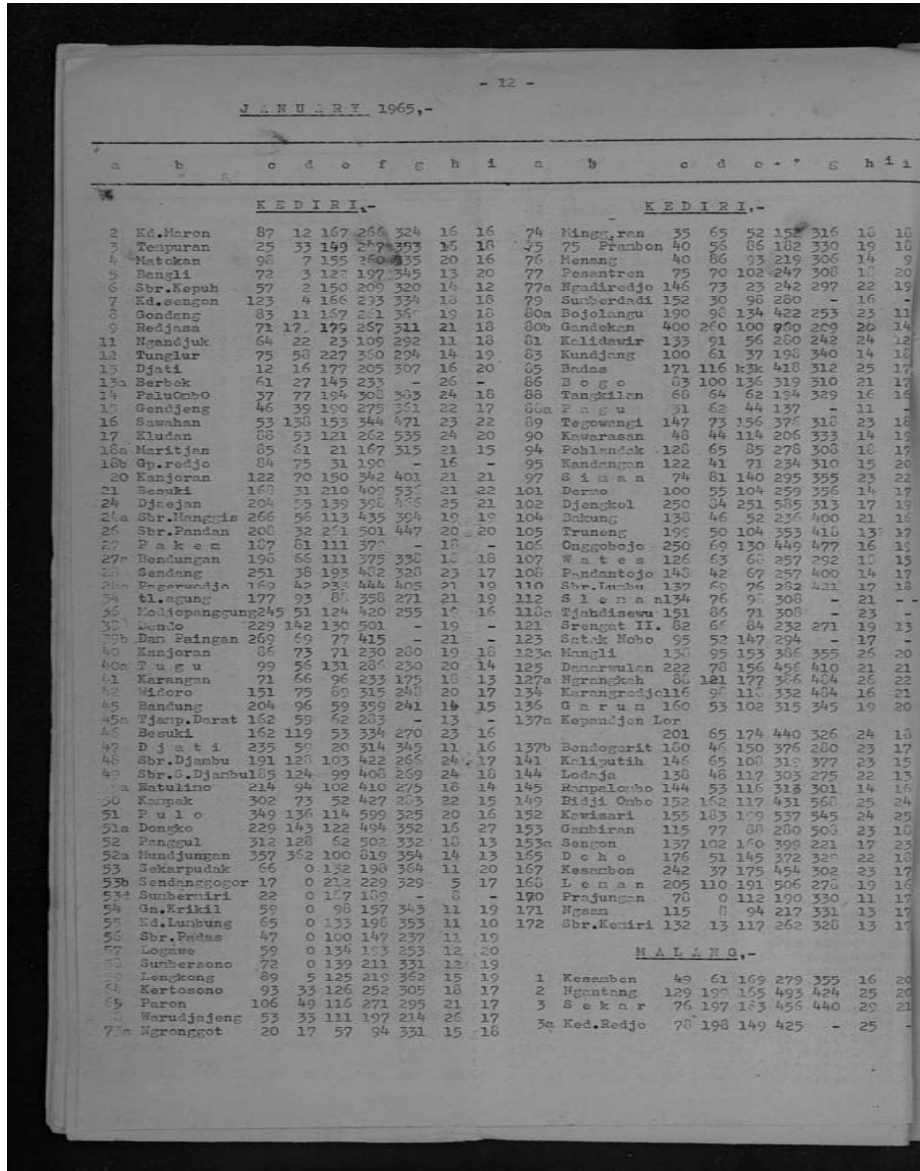


REGENWAARNEMINGEN

IN

NEDERLANDSCH-INDIË.

1917.



JANUARY 1965.-

a	b	c	d	e	f	g	h	i
	KEDIRI.-							
2	Kd.Maron	87	12	167	266	324	16	16
3	Tempuran	25	33	149	207	353	15	18
4	Matokan	98	7	155	260	335	20	16
5	Bangli	72	3	122	197	345	13	20
6	Sbr.Kepuh	57	2	150	209	320	14	12
7	Kd.sengon	123	4	166	293	334	18	18
8	Gondang	83	11	157	251	350	19	18
9	Redjasa	71	17	179	267	311	21	18
11	Ngandjuk	64	22	23	109	292	11	18
12	Tunglur	75	58	227	360	294	14	19
13	Djati	12	16	177	205	307	16	20
13a	Berbek	61	27	145	233	-	26	-
14	PaluOmbO	37	77	194	308	303	24	18
15	Gendjeng	46	39	190	275	351	22	17
16	Sawahan	53	138	153	344	471	23	22
17	Kludan	88	53	121	262	535	24	20
18a	Maritjan	85	81	21	187	315	21	15
18b	Gp.redjo	84	75	31	190	-	16	-
20	Kanjoran	122	70	130	342	401	21	21
21	Besuki	168	33	210	409	537	21	22
24	Djaejan	204	55	139	398	486	25	21
24a	Sbr.Manggis	266	56	113	435	394	19	19
26	Sbr.Pandan	208	32	251	501	447	20	20
27	P a k e m	187	81	111	379	-	18	-
27a	Bendungan	196	66	111	375	330	18	18
28	Gendang	251	38	193	482	320	23	17
28a	Pagerwodjo	169	42	233	444	405	21	19
34	tl.agung	177	93	81	358	271	21	19
36	Modjopanggung	245	51	124	420	255	18	16
38	Bendo	229	142	130	501	-	19	-
39b	Dan Paingan	269	69	77	415	-	21	-
40	Kanjoran	86	73	71	230	280	19	18
40a	T u g u	99	56	131	286	230	20	14
41	Karangan	71	66	96	233	175	18	13
42	Widoro	151	75	89	315	240	20	17
45	Bandung	204	96	59	359	241	14	15
45a	Tjamp.Darat	162	59	62	283	-	13	-
46	Besuki	162	119	53	334	270	23	16
47	D j a t i	235	56	20	314	345	11	16
48	Sbr.Djambu	191	126	103	422	266	24	17
49	Sbr.S.Djambu	185	124	99	408	269	24	18
50	Matulino	214	94	102	410	275	18	14
50	Kampak	302	73	52	427	283	22	15
51	P u l o	349	136	114	599	325	20	16
51a	Dongko	229	143	122	494	352	16	27
52	Panggul	312	128	62	502	332	10	13
52a	Mundjungan	357	362	100	819	354	14	13
53	Sekarpudak	66	0	132	198	384	11	20
53b	Sendangagoer	17	0	212	229	329	5	17
53d	Sumberniri	22	0	107	129	-	8	-
54	Gn.Krikil	59	0	98	157	343	11	19
55	Kd.Lunbung	65	0	133	198	353	11	10
56	Sbr.Pedas	47	0	100	147	237	11	19
57	Loguwe	59	0	134	193	253	12	20
58	Sumbersono	72	0	139	211	331	12	19
59	Lengkong	89	5	125	219	362	15	19
61	Kertosono	93	33	126	252	305	18	17
63	Paron	106	49	116	271	295	21	17
71	Warudjajeng	53	33	111	197	214	26	17
73a	Ngronggot	20	17	57	94	331	15	18

a	b	c	d	e	f	g	h	i
	KEDIRI.-							
74	Ringgiran	35	65	52	152	316	18	18
75	75 Prambon	40	56	86	182	330	19	18
76	Menang	40	86	93	219	306	14	9
77	Pesantren	75	70	102	247	308	18	20
77a	Ngadiredjo	146	73	23	242	297	22	19
79	Sumberdadi	152	30	98	280	-	16	-
80a	Bojolangu	190	98	134	422	253	23	11
80b	Gandekan	400	260	100	760	209	26	14
81	Kalidawir	133	91	56	280	242	24	12
83	Kundjang	100	61	37	198	340	14	18
85	Badas	171	116	k3k	418	312	25	17
86	B o g o	83	100	136	319	310	21	17
88	Tangkilan	68	64	62	194	329	16	19
88a	P a g u	31	62	44	137	-	11	-
89	Tegowangi	147	73	156	376	318	23	18
90	Kawarasan	48	44	114	206	333	14	19
94	Pohlandak	128	65	85	278	308	18	17
95	Kandangan	122	41	71	234	310	15	20
97	S i w a n	74	81	140	295	395	23	22
101	Dermo	100	55	104	259	356	14	17
102	Djengkol	250	94	251	595	313	17	19
104	Bekung	138	46	52	236	400	21	18
105	Truneng	198	50	104	353	416	13	17
106	Onggobojo	250	69	130	449	477	16	18
107	W a t e s	126	63	68	257	292	10	15
108	Pandantojo	143	42	67	257	400	14	17
110	Sbr.Jambu	137	69	76	282	431	17	18
112	S l e n a n	134	76	98	308	-	21	-
116a	Tjahdisewu	151	86	71	308	-	23	-
121	Srengat II.	82	66	84	232	271	19	13
123	Satok Nobo	95	52	147	294	-	17	-
123a	Mangli	130	95	153	386	355	26	20
125	Dawarulan	222	70	156	456	410	21	21
127a	Ngrangkah	88	121	177	386	484	26	22
134	Karangredjo	116	96	110	332	484	16	21
136	G a r u n	160	53	102	315	345	19	20
137a	Kepandjen Lor	201	65	174	440	326	24	18
137b	Bondogarit	180	46	150	376	280	23	17
141	Kaliputih	146	65	108	319	377	23	15
144	Lodaja	138	48	117	303	275	22	13
145	Ranpalombo	144	53	116	313	301	14	16
149	Bidji Ombo	152	162	117	431	568	25	24
152	Kawisari	155	183	109	537	545	24	25
153	Gambiran	115	77	88	280	506	23	10
153a	Sengon	137	102	160	399	221	17	23
155	D e h o	176	51	145	372	320	22	18
157	Kesambon	242	37	175	454	302	23	17
160	L e n a n	205	110	191	506	270	19	16
170	Prajungan	78	0	112	190	330	11	17
171	Ngasen	115	0	94	217	331	13	17
172	Sbr.Keniri	132	13	117	262	328	13	17
	MALANG.-							
1	Kesemben	49	61	169	279	355	16	20
2	Ngantang	129	199	165	493	424	25	20
3	S e k a r	76	197	183	456	440	29	21
3a	Ked.Redjo	78	198	149	425	-	25	-

Scanning of Secondary stations about 73 stations

The selfrecording thermometers and hygrometers are of the Richard type partly with weekly-, partly with daily cylinders. Rainfall is registered by Hellmann-Fuess' or Negretti & Zambra's pluviograph, sunshine by Jordan's sunshine recorder. At a couple of mountainstations are placed selfrecording barometers of Richard. Further part of the stations is provided with mercury-barometers, (Olland's and Adie's pattern) anemometers of Robinson's type, maximum and minimum thermometers (Olland's pattern) and Wild's evaporation balance.

Besides the instrumental observations at some stations the cloudiness and windforce is estimated. In Tosari also the occurrence of mist is noted.

In the following table an account is given of the instruments and observations at the different stations.

The greater number of the stations is provided with ordinary raingauges. At Kandang Badak, Kawah Idjen, Oengoep Oengoep and Sodong Djeroek, which stations cannot be visited daily, specially built raingauges with a large reservoir have been erected. Further of all the selfrecording instruments the records are controlled by direct measurement of the rainfall.

STATIONS.	Eye-reading instruments						Selfrecording instruments.						Other Observations.		
	Dry- and wet bulb.	Maximum-minimum thermometer.	Barometer.	Evaporation balance.	Anemometer and windvane.	Raingauge.	Thermometer.	Hygrometer.	Barometer.	Raingauge.	Tube anemometer.	Sunshine recorder.	Winddirection and force.	Cloudiness.	Mist.
Ambon	×	—	×	—	—	×	×	×	—	×	—	×	—	×	—
Asembagoes	×	×	—	—	—	×	×	×	—	×	—	×	×	—	—
Balikpapan	×	—	—	—	—	×	×	×	—	—	—	—	—	—	—
Bandoeng	×	—	—	×	—	×	×	×	—	×	—	×	—	—	—
Blang Kedjeren	×	×	—	—	—	×	—	—	—	—	—	—	—	—	—
de Bril	—	—	—	—	×	—	—	—	—	—	—	—	—	—	—
Buitenzorg (Observatory station)	×	—	—	×	—	×	×	×	—	—	—	×	—	×	—
" (Department of Agriculture)	×	×	—	×	—	×	×	×	—	×	—	×	—	—	—
Damar Woelan	—	—	—	—	—	×	—	—	—	—	—	×	—	—	—
Discovery Oostbank	—	—	—	—	×	—	—	—	—	—	—	—	—	—	—
Djatiroto(2stations: Emplacement and Blimbing)	×	×	—	—	—	×	—	—	—	—	—	—	—	—	—
Djember	×	×	—	×	—	×	×	×	—	×	—	×	—	—	—
Fort de Kock	×	—	—	—	—	×	×	×	—	×	—	×	—	×	—
Garoem	×	×	—	—	—	×	—	—	—	—	—	—	—	—	—
Goenoeng Rosa	×	—	—	—	—	×	×	×	—	—	—	×	—	—	—
Kajoemas	×	×	—	—	—	×	×	×	—	×	—	×	×	—	—
Kalibagor	—	—	—	—	—	×	—	—	—	×	—	—	—	—	—
Kali Kempit	—	—	—	—	—	×	—	—	—	—	—	×	—	—	—
Kalisat	×	×	—	—	—	×	×	×	—	×	—	×	—	—	—
Kali Sogra Lor	—	—	—	—	—	×	—	—	—	×	—	—	—	—	—
Kandang Badak	—	—	—	—	—	×	—	—	—	—	—	—	—	—	—
Karanganjar	×	×	—	×	—	×	×	×	—	×	—	×	—	—	—
Kawah Idjen	—	—	—	—	—	×	—	—	—	—	—	—	—	—	—
Kawarassan	—	—	—	—	—	×	—	—	—	—	—	×	—	—	—
Kemloko	—	—	—	—	—	×	—	—	—	—	—	×	—	—	—
Kentjong	×	×	—	—	—	×	—	—	—	—	—	×	—	—	—
Klepon	—	—	—	—	—	×	—	—	—	—	—	×	—	—	—
Koepang	×	—	×	—	—	×	×	×	—	×	—	—	—	×	—
Kota Radja	—	—	×	—	—	×	—	—	—	—	—	—	—	—	—
Krampon	×	—	—	—	×	×	—	—	—	—	—	—	—	—	—
Maety Miarang	—	—	—	—	×	—	—	—	—	—	—	—	—	—	—
Manggar	×	—	—	—	—	×	×	×	—	×	—	×	—	—	—
Medan	×	×	×	—	×	×	×	×	×	×	—	×	×	—	—
Menado	×	—	×	—	—	×	×	×	—	×	—	—	—	×	—
Meoang	—	—	—	—	—	×	—	—	—	×	—	×	—	—	—
Merauke	—	—	×	—	—	×	—	—	—	—	—	—	—	—	—
Minggiran	×	×	—	—	—	×	—	—	—	—	—	×	—	—	—
Modjowarno	×	×	—	×	—	×	×	×	—	×	—	×	—	—	—
Moeara Enim	×	×	—	×	—	×	×	×	—	×	—	×	—	—	—
Nobo Paroe	—	—	—	—	—	×	—	—	—	—	—	×	—	—	—
Oengoep Oengoep	—	—	—	—	—	×	—	—	—	—	—	—	—	—	—
Padang	×	—	×	—	—	×	×	×	—	×	—	—	—	×	—
Pangerango	×	—	—	—	—	×	×	×	×	×	—	—	—	—	—
Pasoeroean	×	×	×	—	×	×	×	×	—	×	—	×	—	—	—
Patjet	×	×	—	×	—	×	×	×	—	×	—	—	—	—	—

STATIONS.	Eye-reading instruments						Selfrecording instruments.						Other observations.		
	Dry- and wet bulb.	Maximum-minimum thermometer.	Barometers.	Evaporation balloon.	Anemometer and windvane.	Raingauge.	Thermometer.	Hygrometer.	Barometer.	Raingauge.	Tube anemometer.	Sunshine recorder.	Winddirection and force.	Cloudiness.	Mist.
Pekalongan	×	×	×	×	—	×	×	×	—	×	—	×	—	×	—
Pengadjaran	—	—	—	—	—	×	—	—	—	—	—	×	—	—	—
Petoeng Omboh	—	—	—	—	—	×	—	—	—	—	—	×	—	—	—
Plosokrep	—	—	—	—	—	×	—	—	—	—	—	×	—	—	—
Pontianak	×	—	×	—	—	×	×	×	—	×	—	—	—	×	—
Rogodjampi	×	×	—	—	—	×	×	×	—	×	—	×	×	—	—
Salatiga	×	×	—	×	—	×	×	×	—	×	—	×	—	—	—
Sarokka	×	—	—	—	×	×	×	×	—	—	—	×	—	—	—
Sawahan	×	×	—	×	—	×	×	×	—	×	—	×	—	—	—
Sempalwadak	—	—	—	—	—	×	—	—	—	—	—	—	—	—	—
Seriboe Dolok	×	×	—	—	—	×	—	—	—	—	—	—	×	—	—
Sodong Djeroek	—	—	—	—	—	×	—	—	—	—	—	—	—	—	—
Soember Mangis Kidoel	—	—	—	—	—	×	—	—	—	—	—	×	—	—	—
Soember Telogo	—	—	—	—	—	×	—	—	—	—	—	×	—	—	—
Soember Wadoeng	—	—	—	—	—	×	—	—	—	—	—	×	—	—	—
Soerabaja	—	—	—	—	—	×	—	—	—	—	—	×	—	—	—
Sroenie	×	×	—	—	—	×	—	—	—	—	—	×	—	—	—
Takengon	×	×	—	—	—	×	×	×	—	—	—	—	—	×	—
Tamansarie	×	×	—	—	—	×	×	×	—	×	—	×	×	—	—
Tandjong Pandan	×	—	—	—	—	×	×	×	—	—	—	—	—	—	—
Tarakan	×	—	×	—	—	×	×	×	—	—	—	—	—	—	—
Tegowangi	×	×	—	—	—	×	—	—	—	—	—	×	—	—	—
Tjinjiroean	×	×	—	×	—	×	×	×	—	×	×	×	—	—	—
Tjibodas	×	×	—	×	—	×	×	×	—	×	—	—	—	—	—
Tjipetir	×	×	—	×	—	×	×	×	—	×	—	×	—	—	—
Tlogo	—	—	—	—	—	×	—	—	—	—	—	×	—	—	—
Tosari	×	×	×	×	—	×	×	×	×	×	—	×	×	×	×
Wedi (Birit)	×	×	—	×	—	×	×	×	—	—	—	×	—	—	—

The selfrecording instruments are controlled by eye-readings in the following way:

The dry-bulb and wet-bulb thermometers are read at fixed hours at least twice a day, namely in the early morning and about noon, the times of the extreme values of temperature and humidity. Immediately after the readings hava been taken there is made a little mark with the registering pen of the thermograph and hygrograph on the diagramsheet. In this way there is obtained a timesignal on the diagram and a check on the basevalue and amplitude of the instrument.

For the control of the barograph the hours of the morning-maximum and afternoon-minimum have been taken.

In the cases where the selfrecording raingauge is not provided with a reservoir in which the rain is collected, as is the case with the Negretti & Zambra pattern, a separate raingauge has been placed near it for the purpose of measuring the total daily rainfall.

The corrections of the anemometers have been determined at the Observatory before these are sent to the station. This has been done on a specially built mill by which it was possible to give the instrument a maximum velocity of about 10 M. p. s. turning in a circle of 6 M. radius.

For the station on the top of the Pangerango it is impossible to make daily readings. Once a week the station is visited by a native observer from the mountain garden at Tjibodas to take the readings, to change the paper and to wind the clockworks. Here has been placed a double set of thermographs and hygrographs to prevent as much as possible a discontinuity in the records. As a regular daily comparison of the selfrecording instruments by means of eye-readings is not possible here, the instruments have been previously calibrated at the observatory and further comparisons are taken on occasional visits to the stations by a member of the staff.

The raingauge at Kandang Badak is visited once a week by the observer from Tjibodas on his way to the Pangerango, those at Sodong Djeroek, Oengoep Oengoep and Kawah Idjen at intervals of 5 days, by a native observer from Banjoewangi on his visit to the crater lake.

With regard to the determination of the barometercorrections further particulars will be given under the separate title: „Barometer stations".

At the stations of the Department of Agriculture the selfrecording instruments are compared regularly with the eye-readings, and whenever differences occur, the selfrecording instruments are set right.

RESULT OF DATA DIGITIZATION

A. Batavia Data Hourly for some parameters :

PPP, TAV, BB, BK, HAV, Tension of the atmosferic vapour, precipitation, WD/WS:

- 1866-1875 ; 1879-1880; 1886 – 1897; 1898 – 1931
- 1934 – 1939; 1943 – 1945; 1948 – 1950; 1959 – 1964
- 1968 – 1980

B. Precipitation Data :

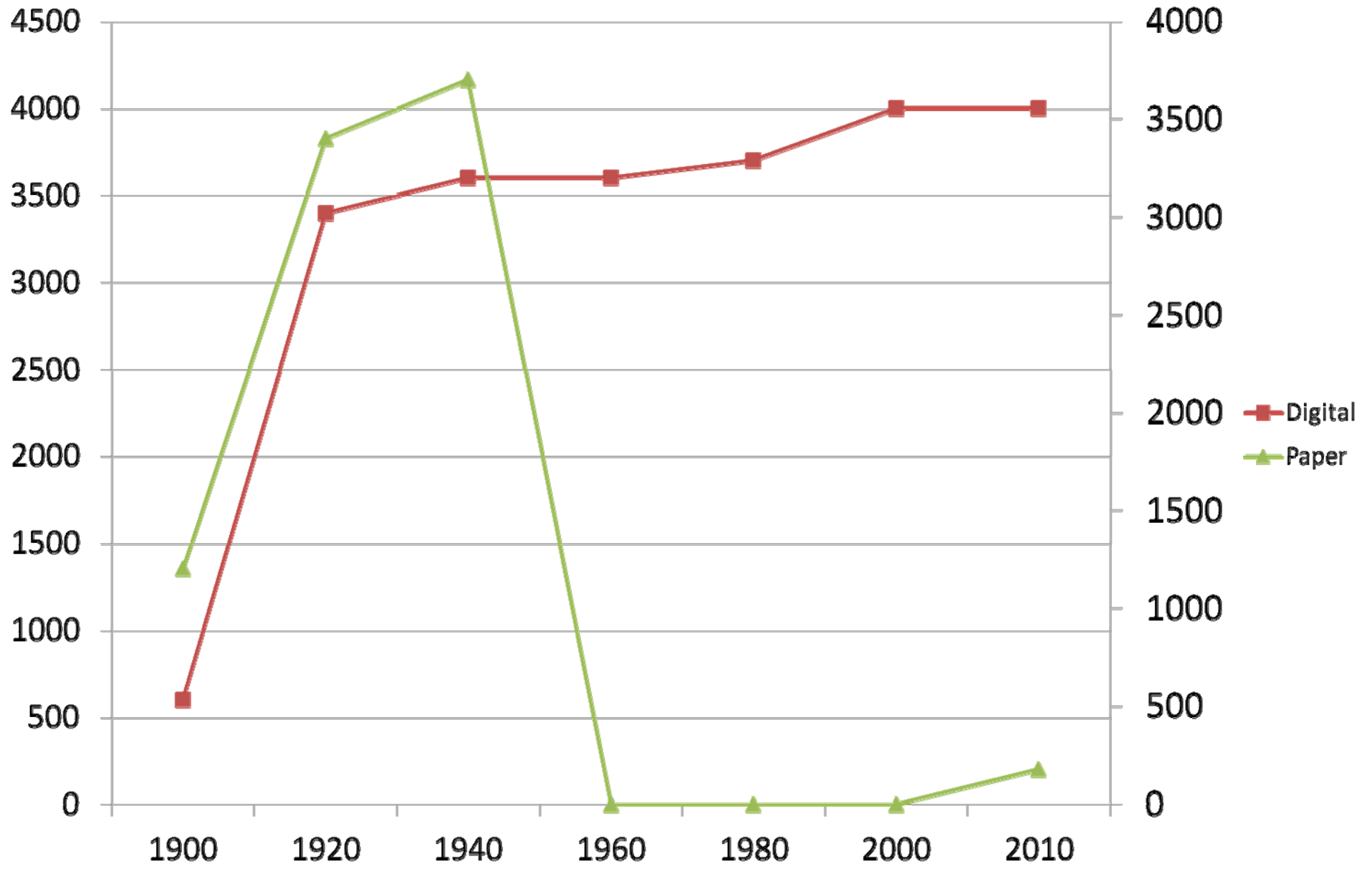
- 1879 – 1900 (data daily rainfall); digitized by KNMI and BMKG.
- 1901 – 1916 (data daily rainfall) digitized by Metropolitan Tokyo University.
- 1917 ~ 1958 (data monthly rainfall) digitized by BMKG

(Database center and Climatology Center staff and Taruna AMG)

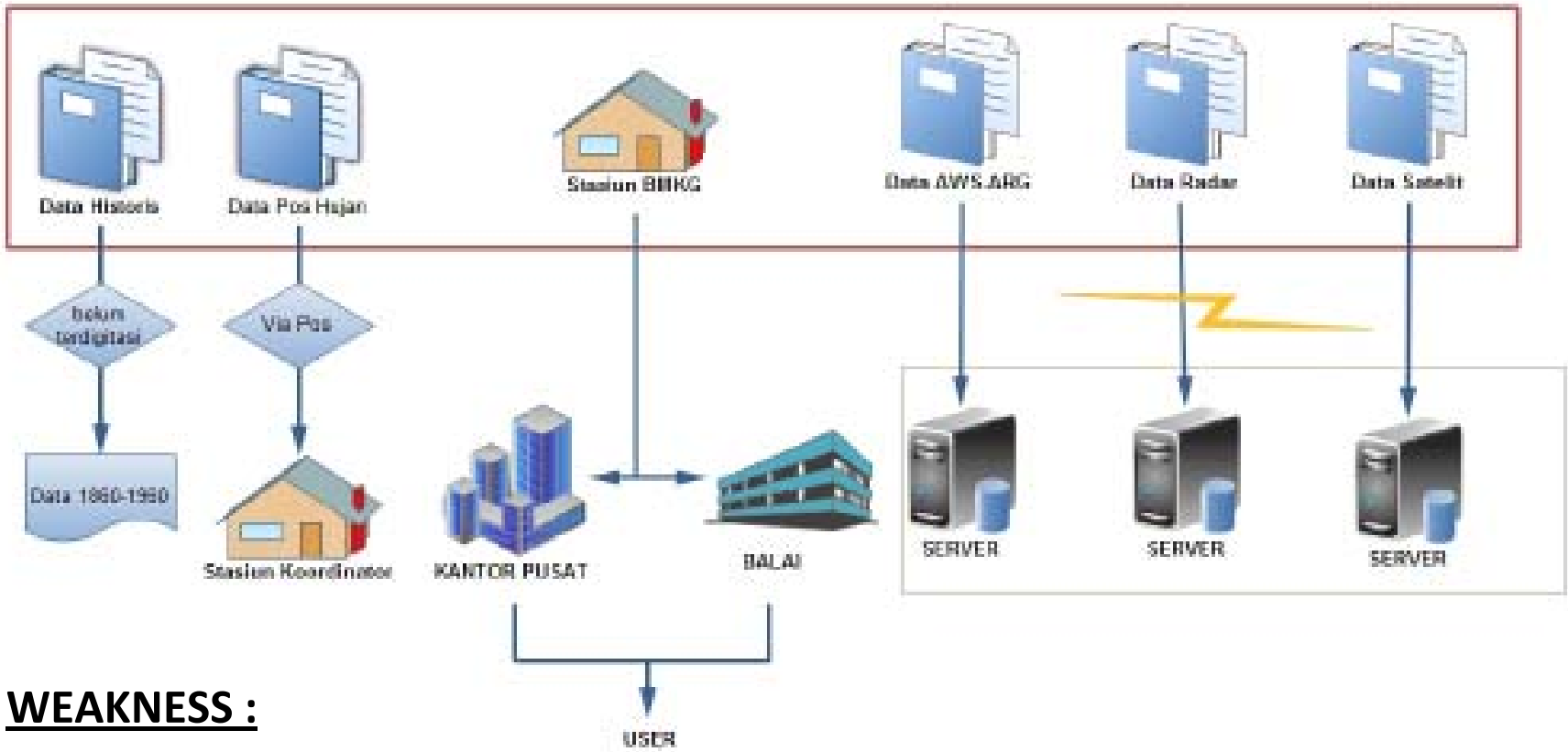
Data Digitization in 2013-2014

- 1958 - 1970 Digitized by Database center staff and Climatology Center staff. (2 years finished).
- Data Batavia : Year 1883 (368 pages)
- Secondary Stations digitized by Taruna AMG. : 4 Books was Finished.
- Number station : 3400 ~ 3700 Observation Stations
- Batavia Daily data 1970 – 1974 (All Parameters)
- Rainfall Monthly Data : 1959 -1972.
- Magnetic Data (1867 – 1934)

The Indonesia data position in 2014



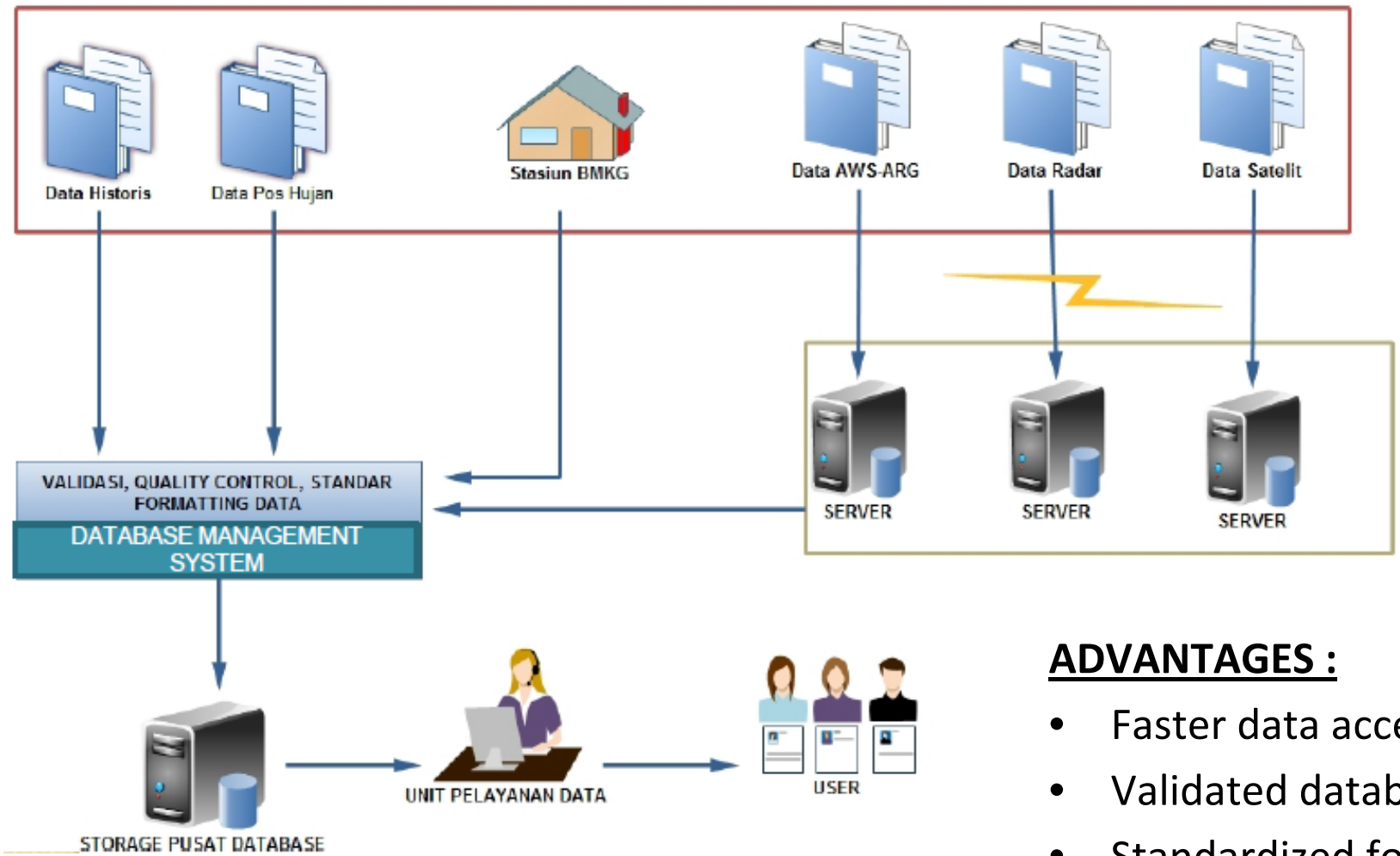
BMKG Data Acquisition (past)



WEAKNESS :

- Poor data access
- Un-validated
- Un-standardized format
- No data integration

BMKG Data Acquisition (near future)



ADVANTAGES :

- Faster data access
- Validated database
- Standardized format
- Data integration


Southeast Asian Climate
Assessment and Dataset
November 2013
SACA & D
(Southeast Asia Climate Assessment & Dataset)
More information
Project website: http://

SACA&D Overview-1

- **Goal :**
  - SACA&D offers science-based climate services for assessing observed changes in climate extremes in the Southeast Asian region and aims to serve stakeholders from e.g. the food-security sector.
  - These services rely on high-quality observational data sets provided by the participants.
- **Participants :**
  - 23 National Meteorological and Hydrological Services, observatories and universities mainly from Southeast Asia.
- **Coordination :**
  - Jointly coordinated by the Badan Meteorologi, Klimatologi, dan Geofisika (BMKG, Indonesia) and the Royal Netherlands Meteorological Institute (KNMI, The Netherlands).

SACA&D Services and Products :

SERVICES :

- Data gathering (long-term daily observational series from met. stations)
- Archiving and storage in a centralized relational database
- QC and homogeneity checks
- Analysis (calculation of indices, particularly related to climate extremes)

PRODUCTS :

- Daily data set built up from 5914 series of obs. for 10 essential climate variables (incl. T and RR) observed at 4065 meteorological stations in 15 countries (34% publicly available)
- Meta information on stations and time series homogeneity
- Maps and plots for changes in extremes in the form of trends, anomalies and climatologies for 44 indices

International Workshop on Digitization of Historical Climate Data (Citeko-Bogor, 02 – 05 April 2012)

- Attended by some ASEAN countries and some International speakers, opened by Director Generalof BMKG and Representative of WMO, Dr. Omar Baddour.

International ASEAN SACA&D Conference & Workshop (IASCW 2014) Citeko,Bogor / 20-23 May 2014.

Reresentative of WMO (Dr. Peer Hechler) with DG of BMKG (President of RA V)

Some Recomendations from IASCW 2014 :

1. A good sense for partnership on equal level is a prerequisite for successful collaboration. The RCC concept provides a platform for such partnership. (SACA&D as an RCC tool, plans to implement RCC Network for ASEAN).

2. Exploit all channels including WMO and regional mechanisms to promote the sharing of as much data appropriate within SACA&D concept.

3. BMKG invites other countries in the South East Asia region to participate in SACA&D while respecting the data policies of the participating countries.

4. Agree on a time specified for maintenance and regular update cycle for the SACA&D system, for example once a month, and as a future step to post a log file with all the system updates required and done on the web.

3. Countries Visit

Country visit Step I (2013) :

- Thailand
- Malaysia
- Singapore
- Philippines
- Brunei Darussalam

Country Visit Step II (2014) :

- Timor Leste (26 - 30 October 2014)
- Cambodia (02 – 05 November 2014)
- Viet Nam (19 – 22 November 2014)
- Myanmar (23 – 26 November 2014)
- Lao-PDR (26 – 29 November 2014)

SUMMARY OF VISIT to 5 ASEAN COUNTRIES :

BMKG

- The TMD has 72 stations and data from 24 stations already ingested in SACA&D
- The TMD support SACA&D existence and would add the number of the station if other ASEAN countries agreed Data Policy for SACA&D of other ASEAN Countries
- The MSS Singapore given a support to SACA&D and underline the importance of operational sustainability of SACA&D.
- The MMD Malaysia still needs to give approval and want to learn more about SACA&D.
- Brunei Darussalam is still waiting the decision from their DG.
- The PAGASA Philippines gives full support to SACA&D and will provide non downlodable high-resolution data for SACA&D.
- The BMKG Indonesia has 173 Observation stations and data from 60 stations has been ingested in SACA&D and in progress to ingest 173 stations.
- BMKG would continue roadshow to the rest 5 other ASEAN countries (Myanmar, Vietnam, Lao PDR, Cambodia and Timor Leste) in 2014.

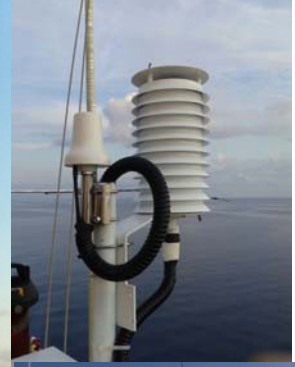
BMKG

BMKG Modernization through Strengthening BMKG Climate and Weather Service Capacity Project 2012-2015


Medan RC
Jakarta HQ
Ciputat RC
Denpasar RC
Makassar RC
Jayapura RC
Observation Systems
Automatic Weather Station (Synoptic & Mesonetwork)
X 66 (2 per province)
VOS (Voluntary Observing Ship)
X 5
Calibration
HQ + Regional Centers
AWOS
1 airport
Wind Profiler
1 airport
Upper Air Observation
X 5 sites
Hydrogen Generator
X 5 sites
Lightning network
X 9 sensors + HQ (processing)
Information Systems
Transmet (Telecom)
HQ + 5 Regional Centers
ObsNet (Data Collection)
5 Regional Centers
CIPS (Data Center + NWP & pollution Models)
HQ
AeroMetWeb (Pilot briefing)
4 airports
Synergie (Forecasting workstation)
21 client workstations (HQ + 5 Regional Centers)
MeteoFactory (Public Weather Services & Warning)
HQ + 5 Regional Centers
VisuMet (Public Display)
15 systems
TV Met (TV bulletin)
HQ + 1 TV channel
CliSys (Climate Data Management)
HQ
Telecommunication
Forecasting
Public Weather & Climate Services
WIS Center
OpenWIS
Agriculture
Forestry
Fishery
Aviation
Marine
Oil & Gas
Civil Security
Media
Tourism
BMKG End users
Consultancy
Design
Supply of systems
Integration
Project management
Change management
Transfer of know-how
Training
Technical support
Support Services
mfi
METEO FRANCE INTERNATIONAL
BMKG

Modernization on Observation System

AWOS

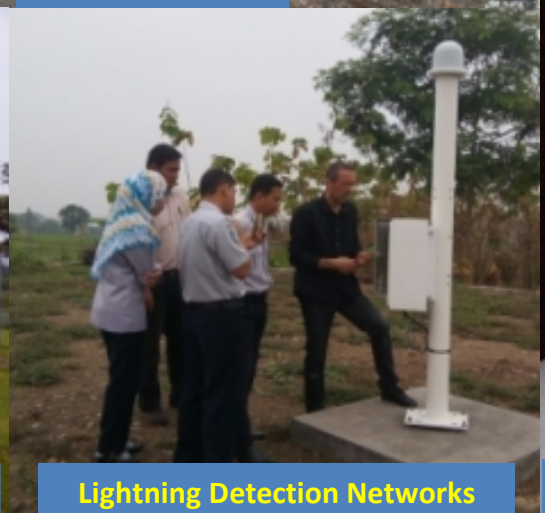


Voluntary Observing Ships

Surface Observation Network

Wind Profiler

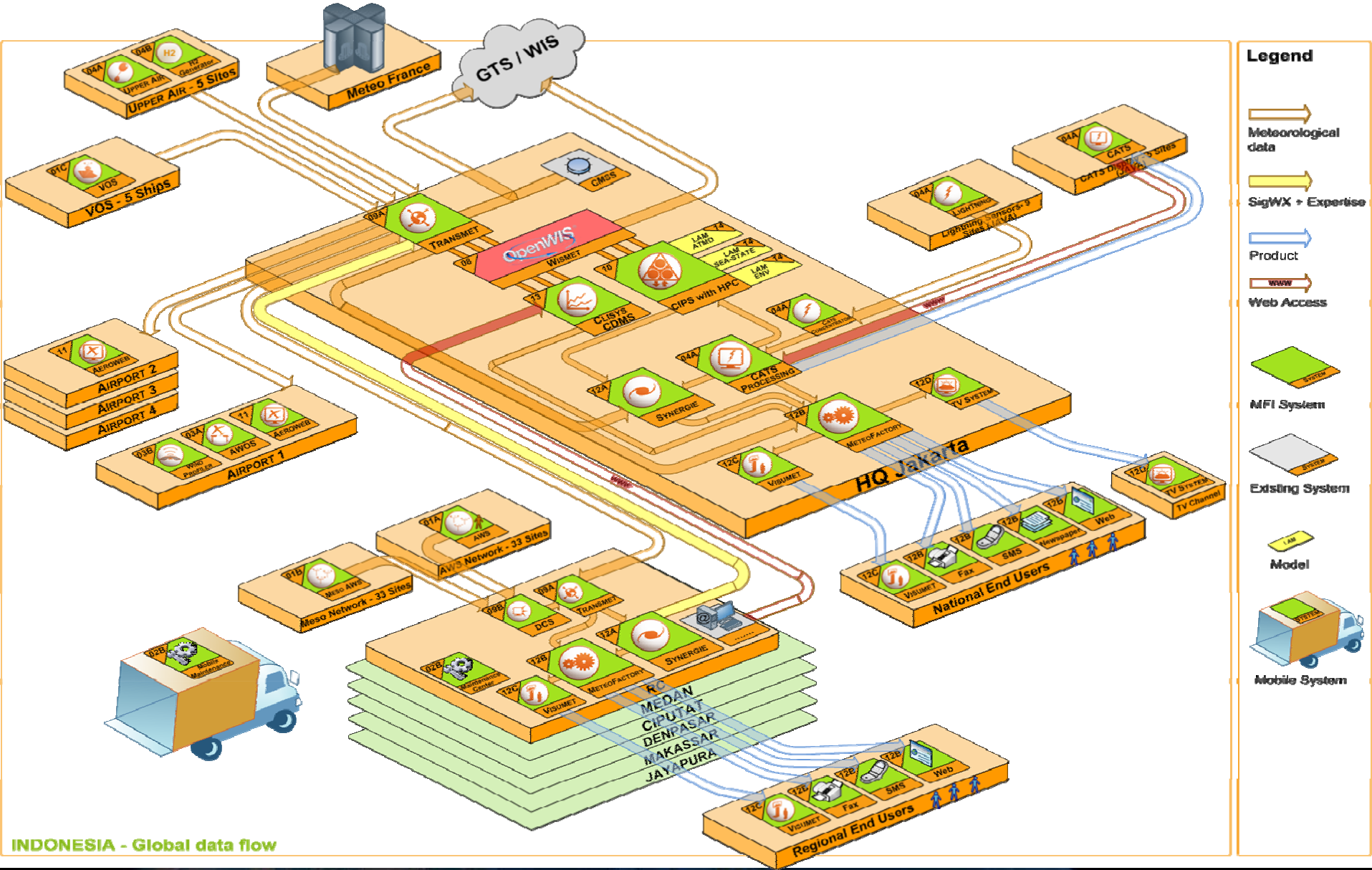
Upper Air Observation Network



Lightning Detection Networks

Hydrogen Generator for Upper Air Balloon Inflation

Modernization on Integrated Dataflow



INDONESIA - Global data flow

Modernization on IT Infrastructures

Weather Analysis and Forecasting Tools

Central Information and Processing System – High Performance Computing System

BMKG

Transformation of Manual Production System towards Digital Forecasting System & Automatic Production

I. Benefit of the Project :

1. Enhance the effectiveness of BMKG
2. Contribute to regional and WMO programme
3. Raise the institution's profile and develop its recognition by the public
4. Automate and boost production towards economic sectors
5. Increase BMKG's visibility and its relations with stakeholders

II. Implementation of Digital Forecast & Automatic Production Concepts

Why Digital Forecast ???

- Automatic production system and dissemination
- All products in digital format
- Information products nationally integrated
- Mass production
- Comply with CAP WMO standard
- Major inputs for derived-products for public and media (TV System, Visumet, Website)

III. Digital Forecast system :

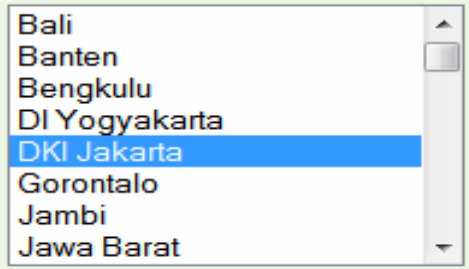
Meteo Factory

Main Modul

- The warnings module
  Warnings
- The Weather forecast module
  WeatherForecast
- The cyclone module
  Cyclone
- The reports module
  Reports
- The production builder module
  ProductionBuilder
- The production control module
  ProductionControl
- The administration module
  Administration

Model guidance

Access by Province



Validasi Prakiraan per wilayah

Input Data Prakiraan

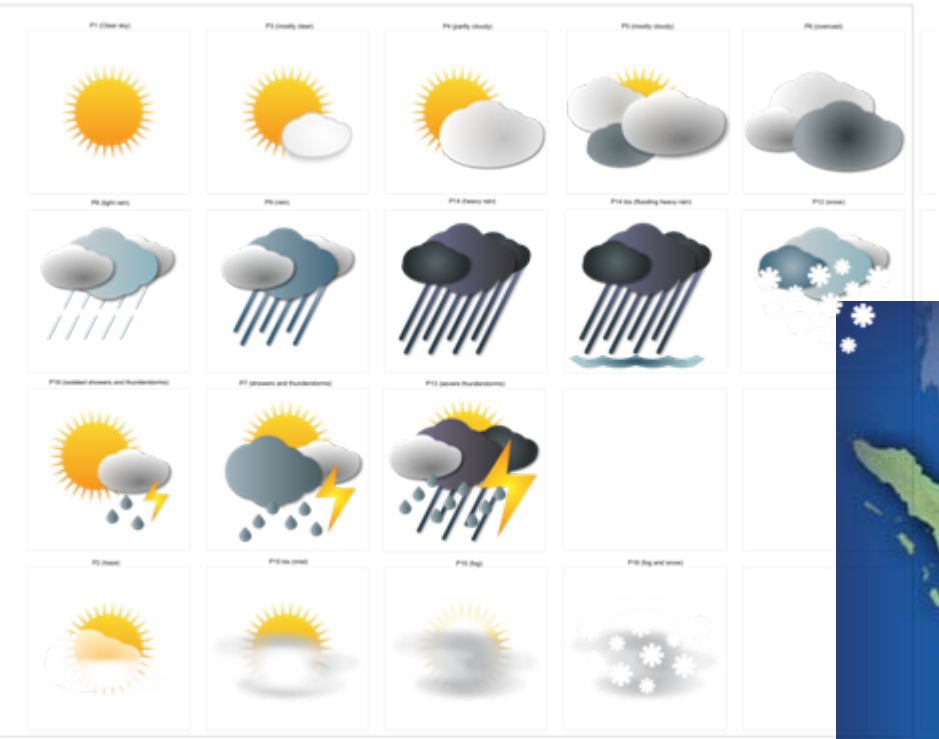
Forecast technical guidances:

Current Guidance

File	Size	Last Modified	Expires
Tuesday03March2015-AM	7Kb	03/03/2015 09:21	04/03/2015 10:21
Tuesday03March2015-PM	7Kb	03/03/2015 17:25	04/03/2015 17:25

IV. Improved Services through Digital Forecast (1)

a. Enhance Graphical Elements:

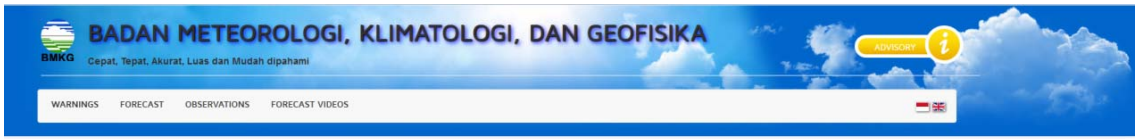


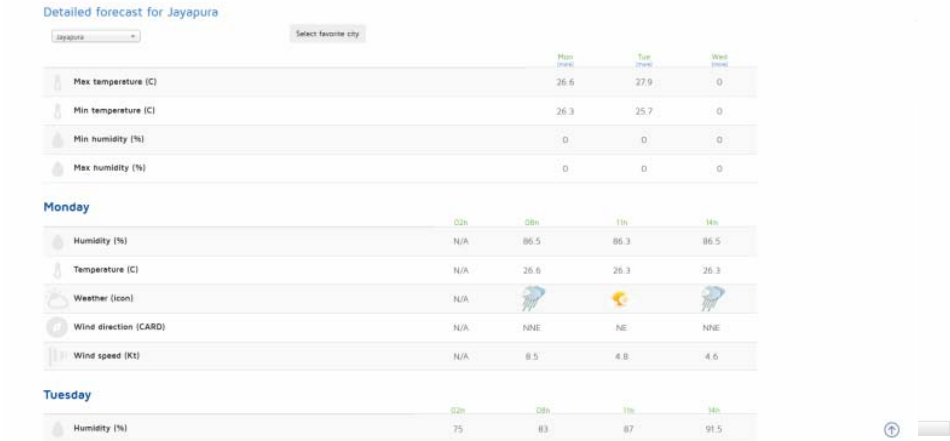
Weather symbols (extracts)

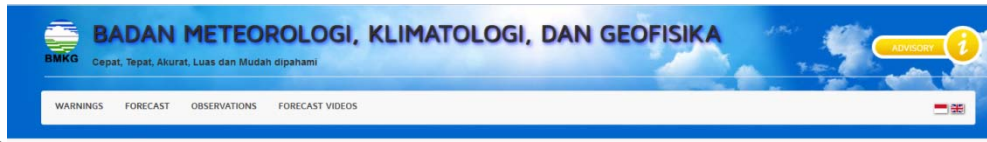
Maps rendering

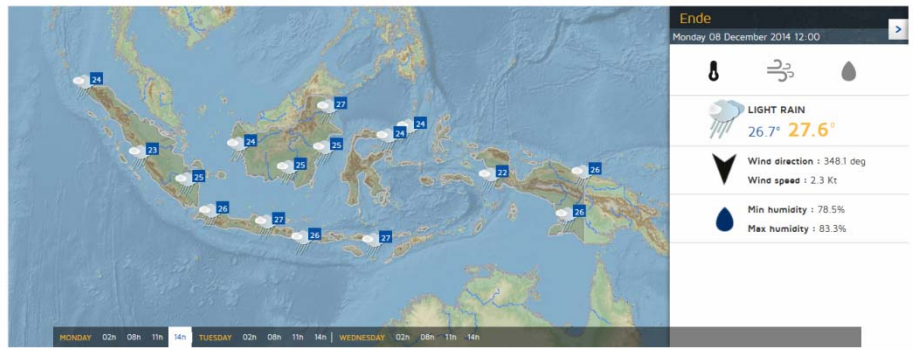
Improved Services through Digital Forecast (2)

b. Web-based Products Dissemination (http://meteo.bmkg.go.id):



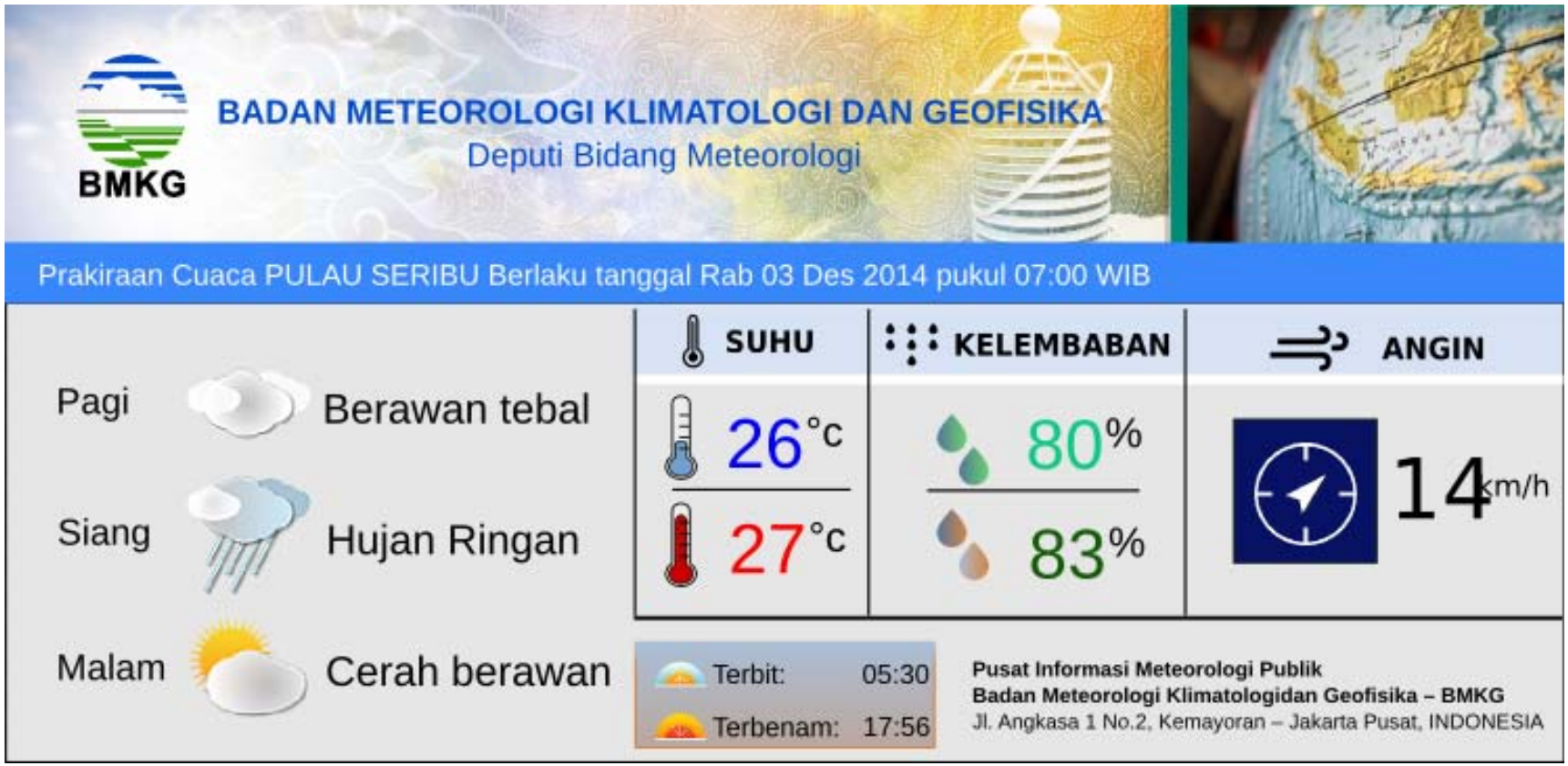






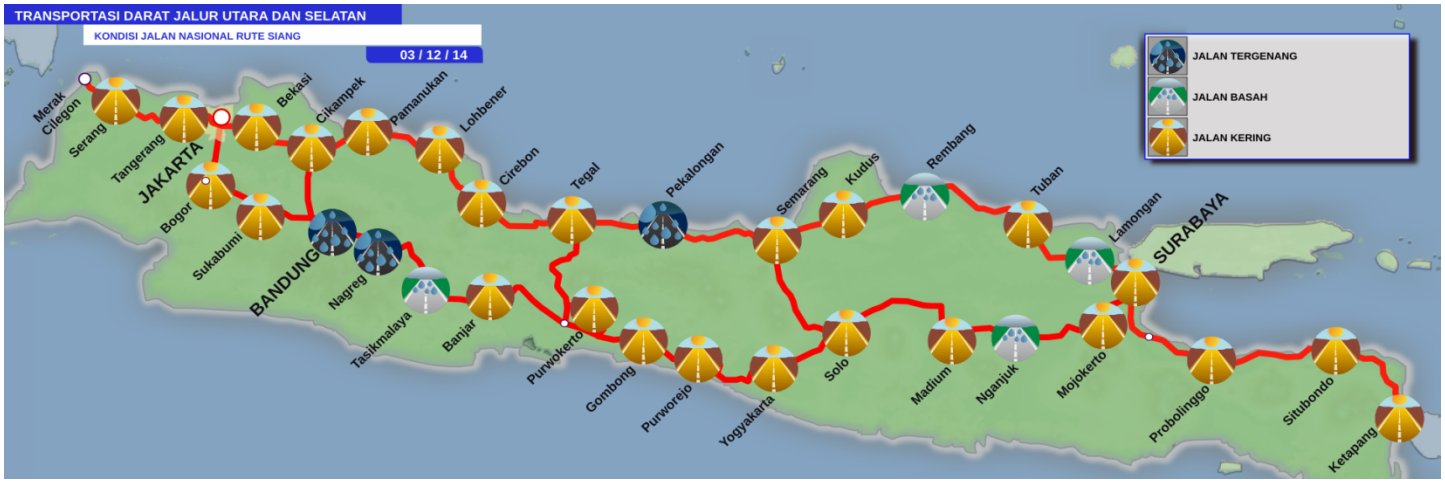
Improved Services through Digital Forecast (3)

c. Products Diversification :



Improved Services through Digital Forecast (4)

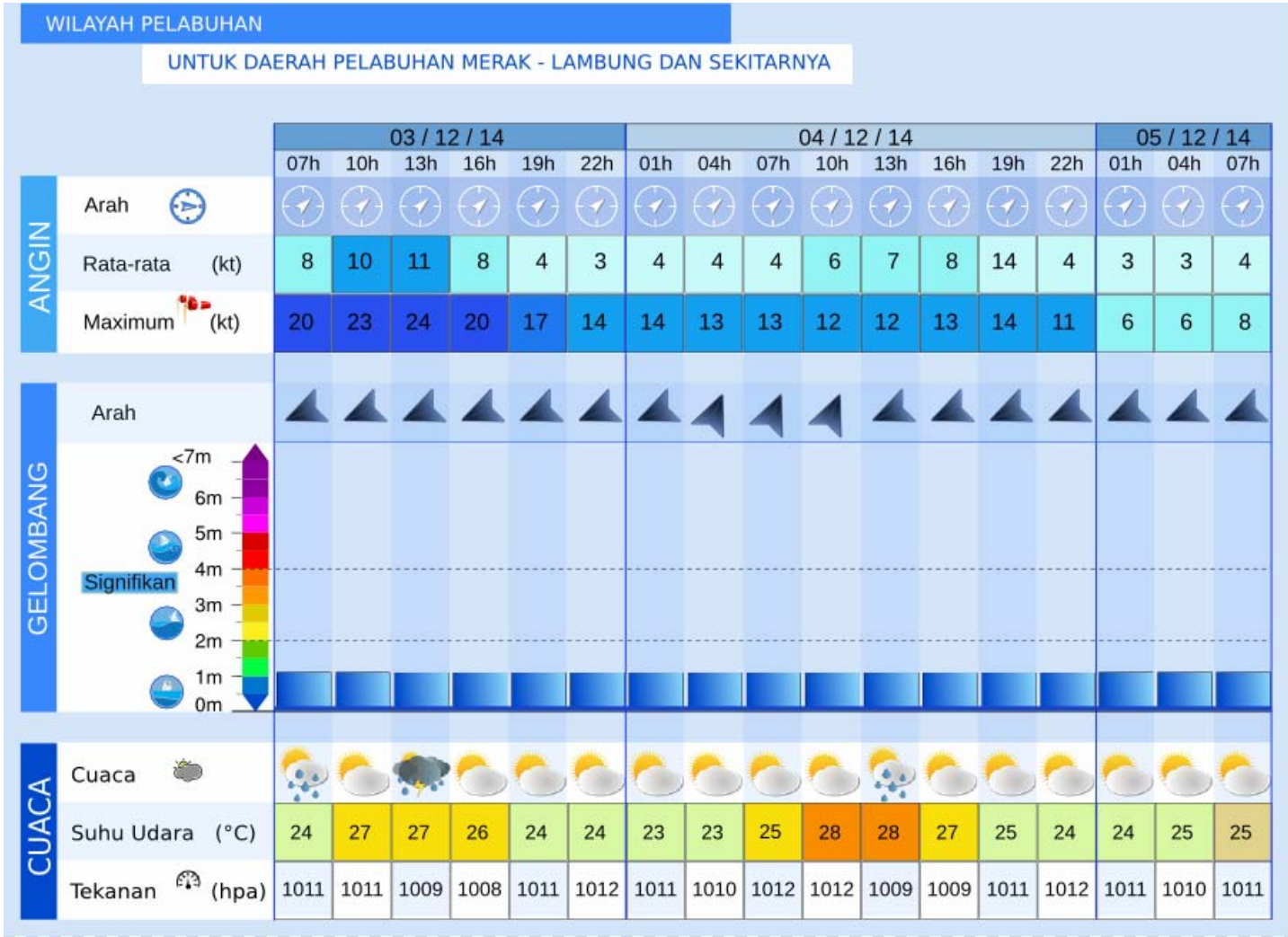
d. Production of Specific Products for Specific Users



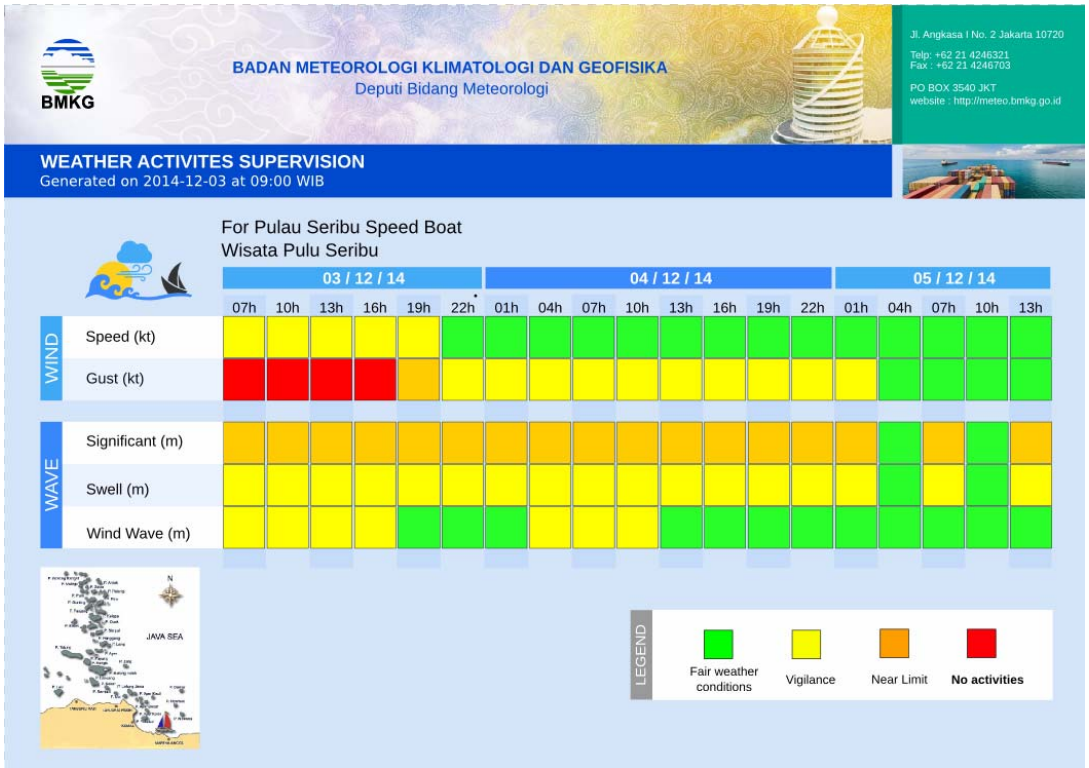
Road operations

Railway Operations

Port operations:

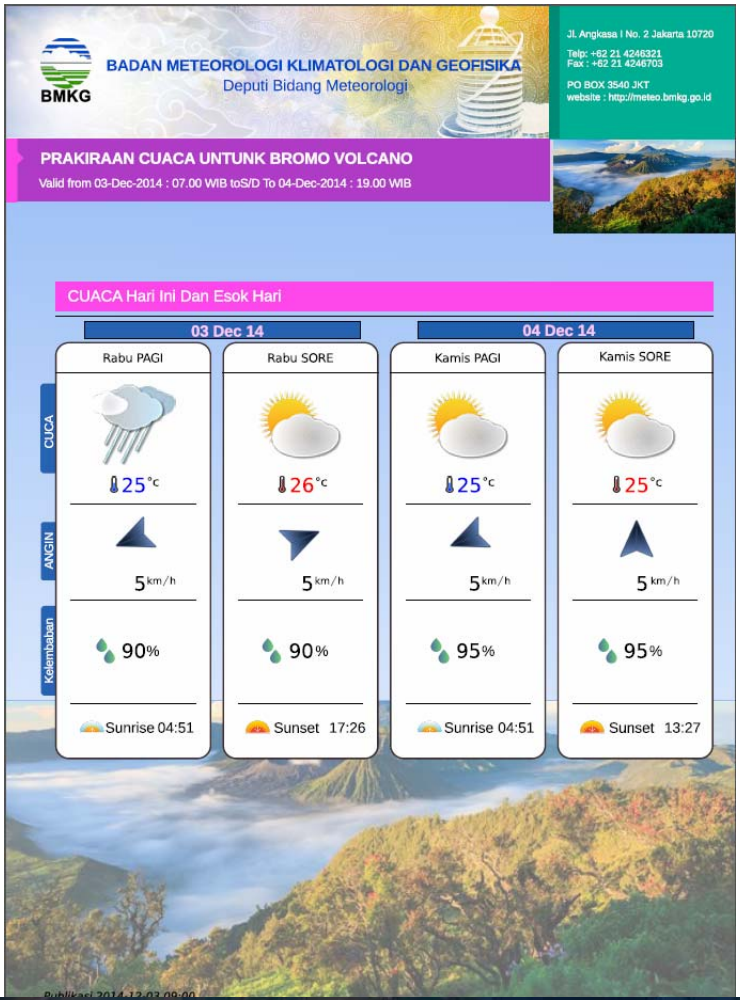


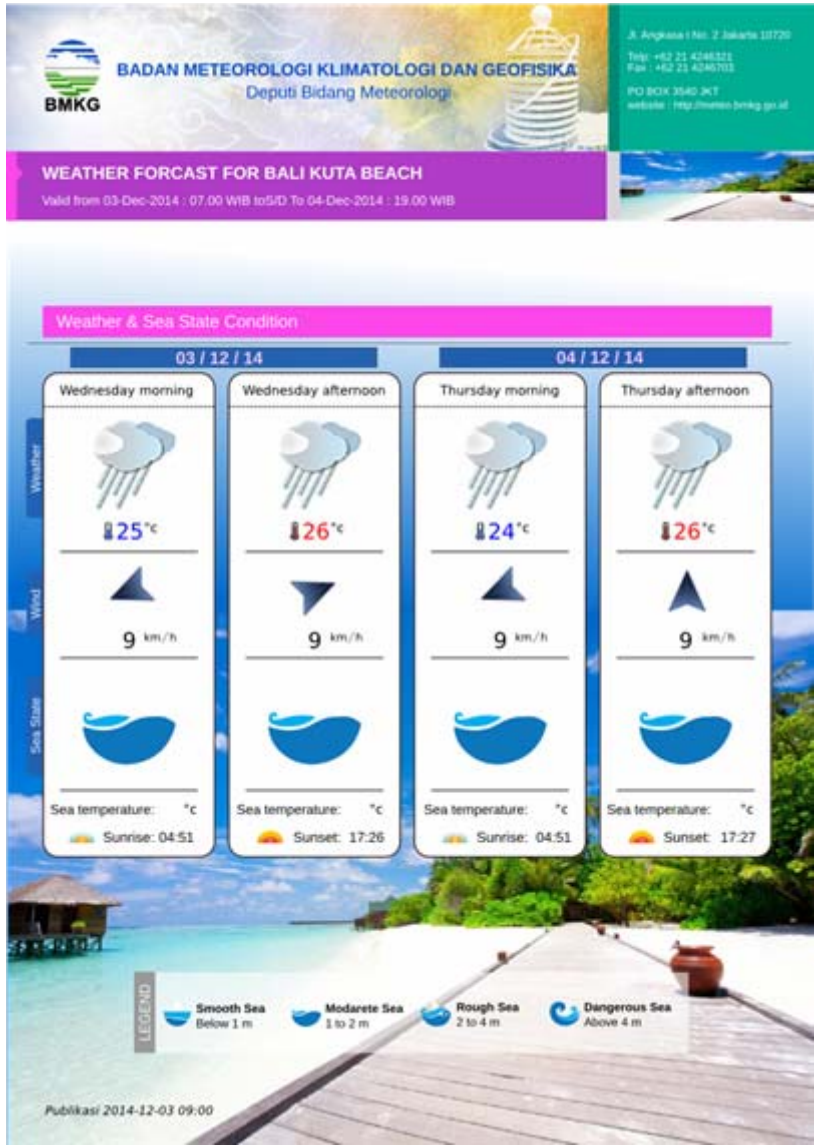
Fishing activities:



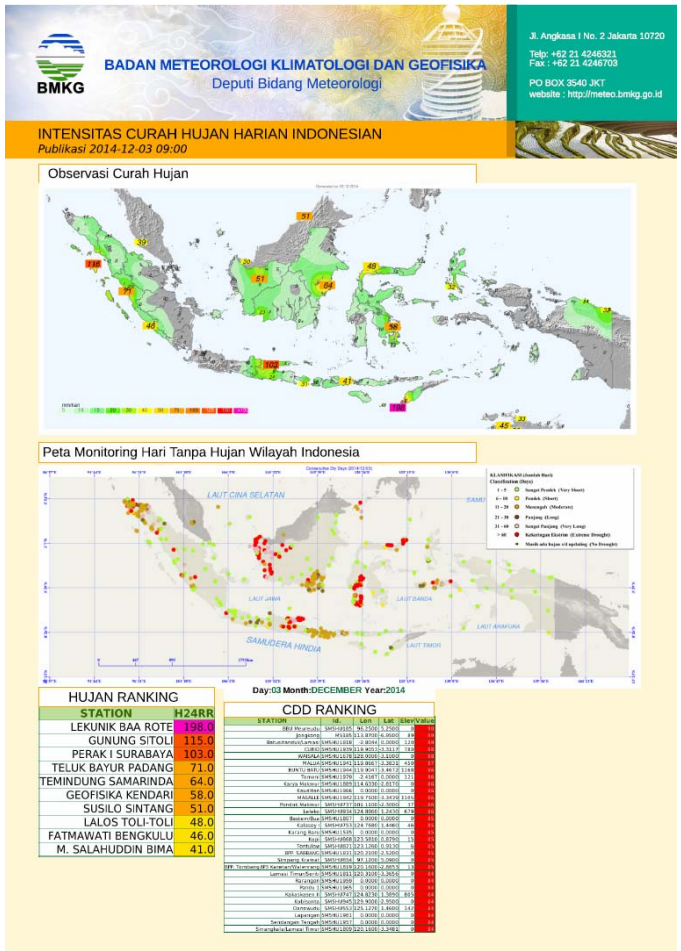
Marine Tourism:

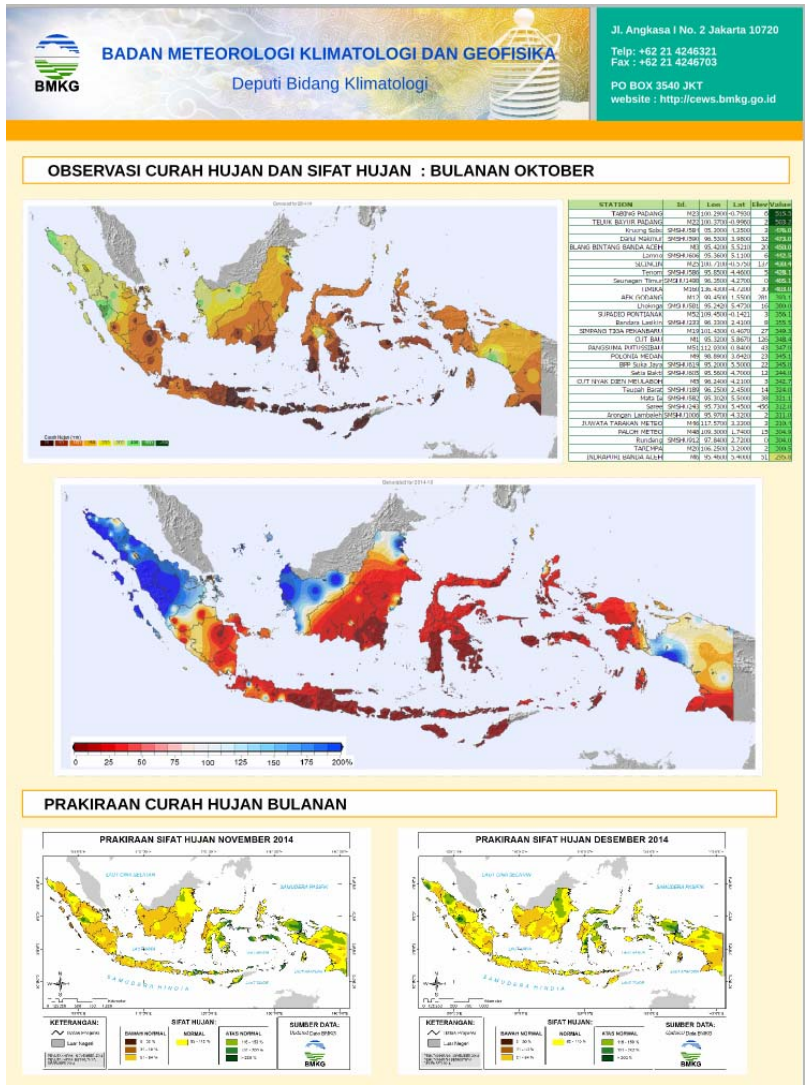
- **Tourism:**


BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA
Deputi Bidang Meteorologi
BMKG
Jl. Angkasa I No. 2 Jakarta 10720
Telp: +62 21 4246321
Fax : +62 21 4246703
PO BOX 3540 JKT
website : http://meteo.bmkg.go.id
PRAKIRAAN CUACA UNTUNK BROMO VOLCANO
Valid from 03-Dec-2014 : 07.00 WIB toS/D To 04-Dec-2014 : 19.00 WIB
CUACA Hari Ini Dan Esok Hari
03 Dec 14
04 Dec 14
Rabu PAGI
Rabu SORE
Kamis PAGI
Kamis SORE
CUCA
ANGIN
Kelembaban
25°c
26°c
25°c
25°c
5 km/h
5 km/h
5 km/h
5 km/h
90%
90%
95%
95%
Sunrise 04:51
Sunset 17:26
Sunrise 04:51
Sunset 13:27


BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA
Deputi Bidang Meteorologi
BMKG
WEATHER FORCAST FOR BALI KUTA BEACH
Valid from 03-Dec-2014 : 07.00 WIB toS/D To 04-Dec-2014 : 19.00 WIB
Weather & Sea State Condition
03 / 12 / 14
04 / 12 / 14
Wednesday morning
Wednesday afternoon
Thursday morning
Thursday afternoon
Weather
Wind
Sea State
25°c
26°c
24°c
26°c
9 km/h
9 km/h
9 km/h
9 km/h
Sea temperature: °c
Sea temperature: °c
Sea temperature: °c
Sea temperature: °c
Sunrise: 04:51
Sunset: 17:26
Sunrise: 04:51
Sunset: 17:27
LEGEND
Smooth Sea
Below 1 m
Modarete Sea
1 to 2 m
Rough Sea
2 to 4 m
Dangerous Sea
Above 4 m
Publikasi 2014-12-03 09:00

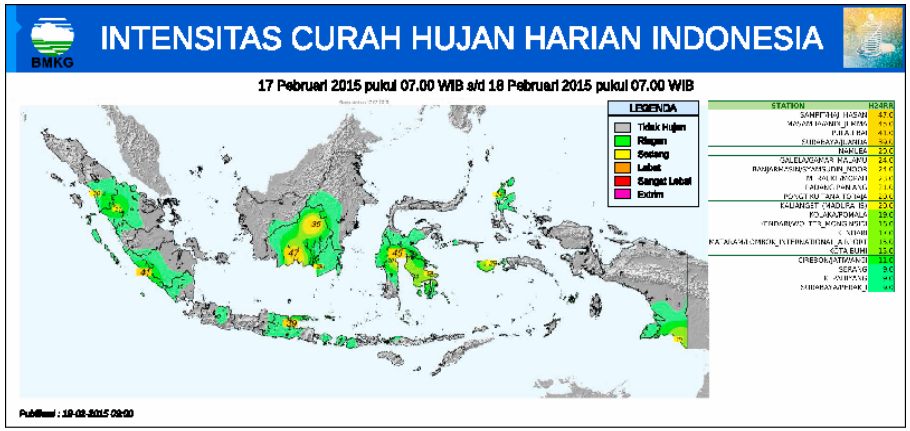
- **Agriculture:**



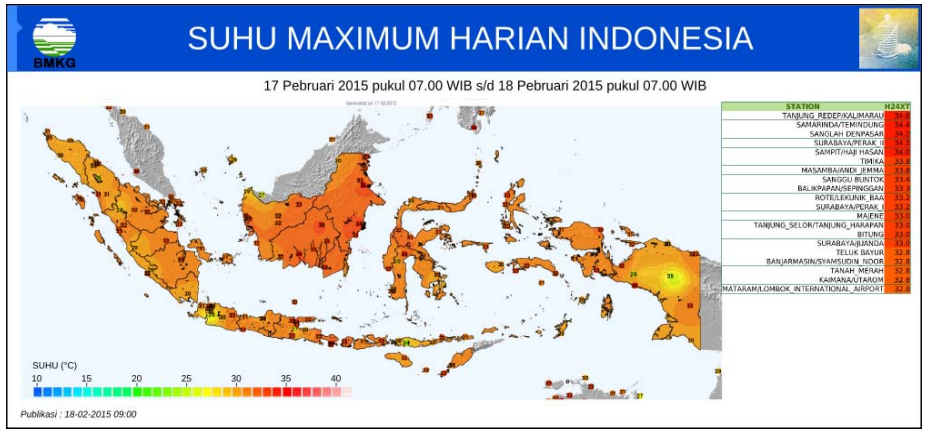


V. Current Available Automated Products :

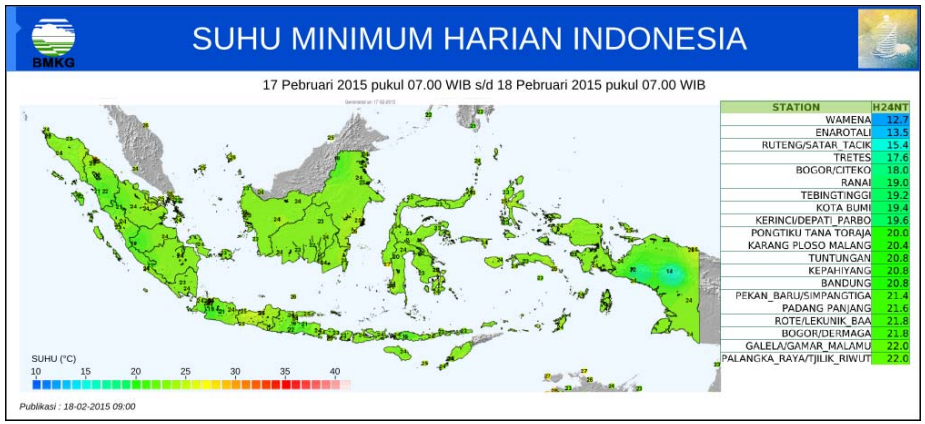
A. Daily Precipitation Analysis



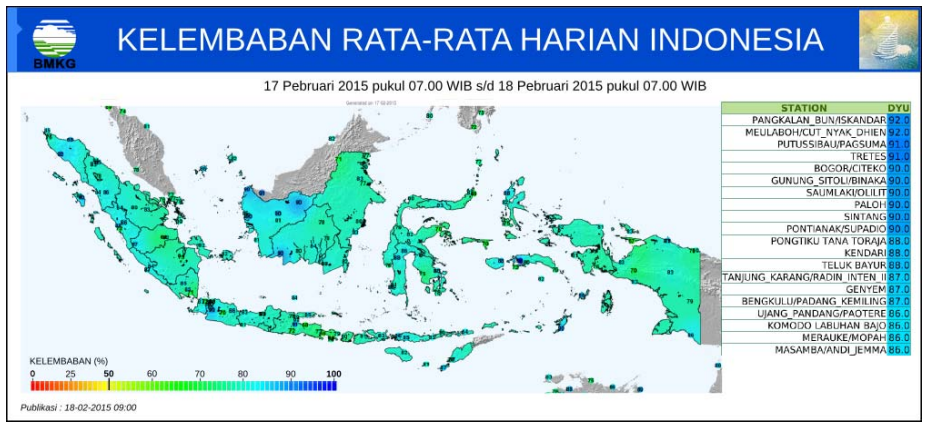
B. Daily Maximum Temperature



C. Daily Minimum Temperature



D. Daily Mean Relative Humidity



E. Daily Forecast Products - National:

BMKG

BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA
Deputi Bidang Meteorologi

Pusat Informasi Meteorologi Publik

Jl. Angkasa 1 No.2, Kemayoran
Jakarta Pusat, INDONESIA

No. Surat : R.105.A/04/2015

Prakiraan Cuaca Indonesia
Berlaku Mulai Rabu 15 April 2015 07.00 WIB
Hingga Kamis 16 April 2015 07.00 WIB

LOKASI	CUACA PAGI	CUACA SIANG	CUACA MALAM	CUACA DINI HARI	SUHU °C	ANGIN km/h	KELEMBABAN %
Banda Aceh					22 – 27	3	82 – 94
Medan					23 – 29	13	69 – 98
Pekanbaru					23 – 29	6	75 – 98
Batam					25 – 28	8	76 – 90
Jambi					23 – 29	3	70 – 95
Padang					20 – 27	5	87 – 91
Palembang					23 – 30	4	68 – 97
Pangkal Pinang					23 – 27	3	76 – 97
Bengkulu					25 – 28	17	79 – 89
Bandar Lampung					22 – 30	4	65 – 98
Pontianak					23 – 31	6	63 – 95
Samarinda					24 – 30	5	70 – 93
Palangkaraya					23 – 29	5	68 – 94
Banjarmasin					24 – 31	5	61 – 92
Manado					21 – 28	4	70 – 89
Gorontalo					25 – 28	10	76 – 84
Donggala					24 – 27	9	83 – 92
Kendari					22 – 29	8	75 – 96
Makassar					24 – 29	6	72 – 90
Majene					26 – 28	8	72 – 87

LOKASI	CUACA PAGI	CUACA SIANG	CUACA MALAM	CUACA DINI HARI	SUHU °C	ANGIN km/h	KELEMBABAN %
Ternate					26 – 27	12	80 – 86
Ambon					25 – 28	4	71 – 84
Jayapura					23 – 26	12	83 – 96
Sorong Kota					21 – 29	6	69 – 92
Biak					24 – 28	7	73 – 88
Manokwari					23 – 28	3	74 – 87
Merauke					25 – 27	17	77 – 87
Kupang					25 – 30	18	59 – 86
Sumbawa Besar					22 – 29	7	66 – 85
Mataram					24 – 27	5	80 – 84
Denpasar					25 – 29	9	80 – 95
Tanah Abang					24 – 31	9	75 – 90
Serang					23 – 28	8	80 – 95
Bandung					19 – 23	4	73 – 97
Semarang					23 – 27	8	73 – 85
Yogyakarta					22 – 28	6	67 – 92
Surabaya					26 – 28	16	79 – 88

LEGENDA

Jakarta, Rabu 15 April 2015
Prakirawan

Agie Wandala Putra
NIP. 198607202007011004

F. Daily Forecast JABODETABEK

BMKG
BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA
Deputi Bidang Meteorologi
Pusat Informasi Meteorologi Publik
Jl. Angkasa 1 No.2, Kemayoran
Jakarta Pusat, INDONESIA

Prakiraan Cuaca Jabodetabek
Berlaku Mulai Rabu 15 April 2015 07.00 WIB
Hingga Kamis 16 April 2015 07.00 WIB

LOKASI	CUACA PAGI	CUACA SIANG	CUACA MALAM	CUACA DINI HARI	SUHU °C	ANGIN km/h	KELEMBABAN %
Pulau Seribu					26 – 28	9	80 – 95
Kebayoran Baru					24 – 31	9	65 – 100
Bekasi					24 – 31	9	70 – 100
Depok					24 – 30	9	70 – 100
Tanjung Priok					24 – 31	9	75 – 90
Grogol Petamburan					24 – 31	9	75 – 90
Tanah Abang					24 – 31	9	75 – 90
Cakung					24 – 30	9	75 – 95
Tangerang					24 – 30	9	80 – 90
Bogor					22 – 27	9	80 – 100

WARNING :

Jakarta, Rabu 15 April 2015
Prakirawan

Agie Wandala Putra
NIP. 198607202007011004


Thank you for your attention ...