WRDC progress report.
A Brief Survey

Anatoly Tsvetkov
World Radiation Data Centre

World Data Centre (ET-WDC) Managers Meeting
13-14 May 2010. Toronto, Canada

"There are five GAW WDCs each responsible for archiving one or more GAW measurement parameters or measurement types…"

"They are operated and maintained by their individual host institutions…".

"They collect, document and archive atmospheric measurements and the associated metadata from measurement stations world-wide…".

"Make these data freely available to the scientific community."

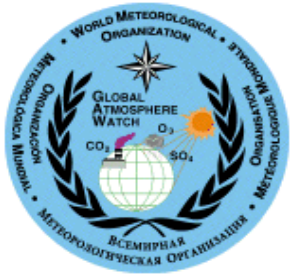
http://www.wmo.int/pages/prog/arep/gaw/world_data_ctres.html

The Thirteenth Session of CAS:

"For scientific purposes, access to these data is unlimited and provided without charge. By their use you accept that an offer of co-authorship will be made through personal contact with the data providers or owners whenever substantial use is made of their data. In all cases, an acknowledgement must be made to the data providers or owners and the data centre when these data are used within a publication.“

WORLD RADIATION DATA CENTER
(WRDC)
2010: - 46 Years of Activity.

WMO

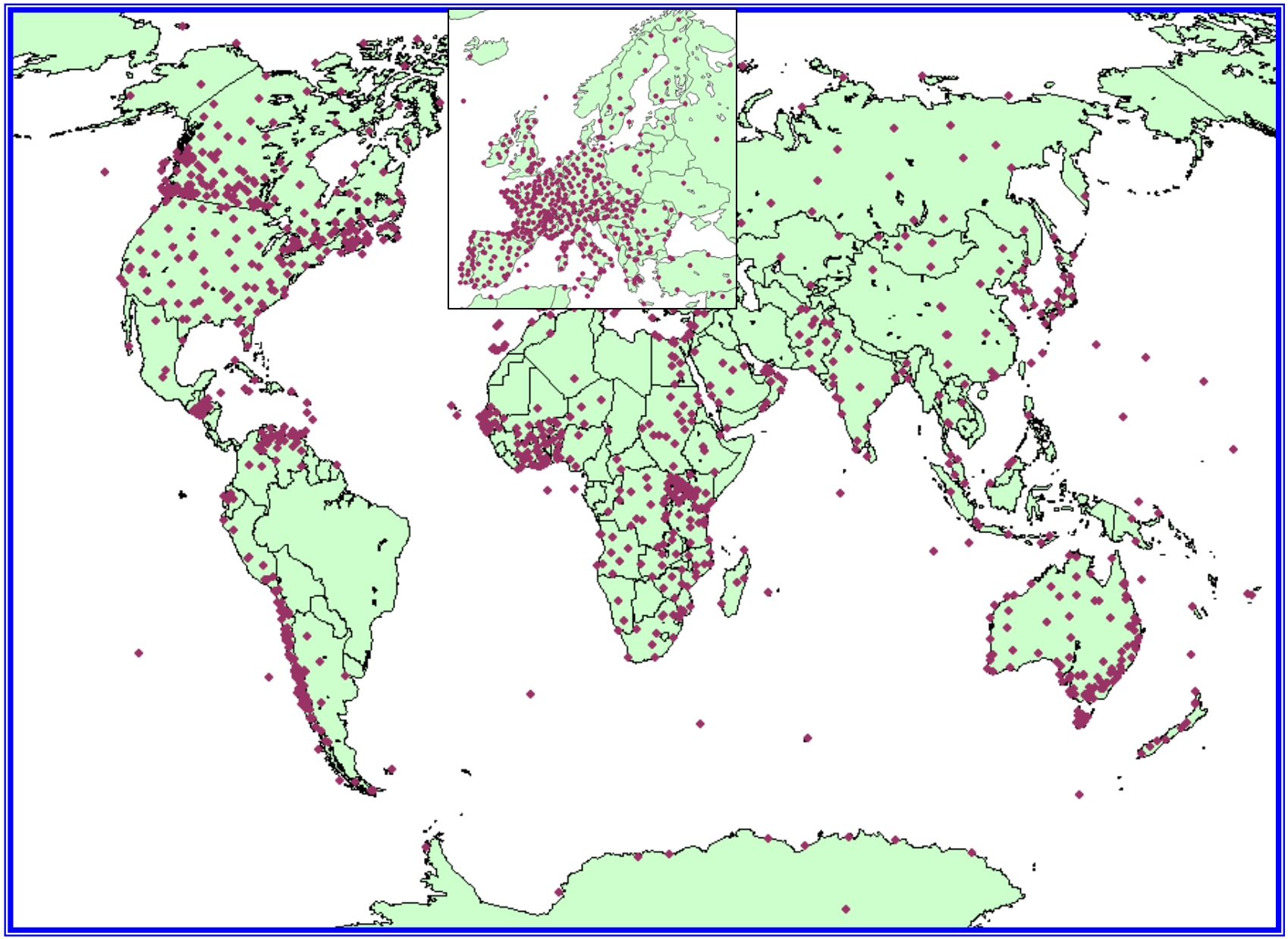


GAW

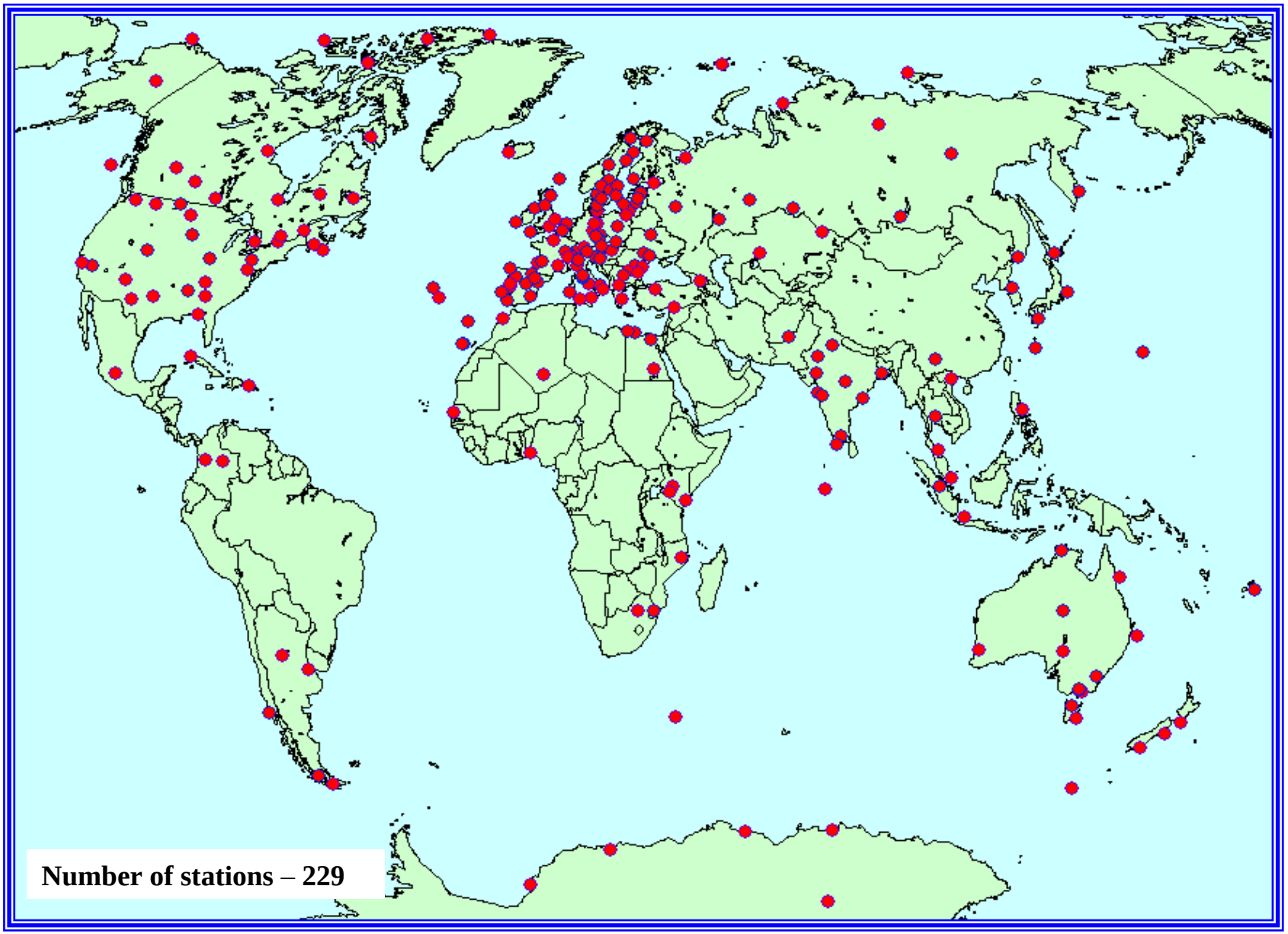
ROSHYDROMET

MGO

World Radiation Network in WRDC Archive



WRDC: GAW stations (1994-2009)



WRDC ACTIVITY

Central collection and data processing

Quality check procedures + **metadata**

Communication with NWS - quality assurance (QA)

Archiving and **Time Series Analysis**

Bulletin “Solar Radiation and Radiation Balance. The World Network”

Information System of WRDC: **Server** and Database

“Good metadata are needed to ensure that the final data user has no doubt about the conditions in which data have been recorded, gathered and transmitted, in order to extract accurate conclusions from their analysis.”

In “GUIDELINES ON CLIMATE METADATA AND HOMOGENIZATION”

by Enric Aguilar1, Inge Auer2, Manola Brunet1, Thomas C. Peterson3 and Jon Wieringa4

.

2003, World Meteorological Organization

WMO/TD No. 1186

Examples of WRDC metadata sheet for a single station.

CATEGORY	METADATA TYPE
STATION IDENTIFIERS	**Local Code** **WMO Code** **Name and aliases** **Active/Closed** **Beginning/End Date**
GEOGRAPHICAL DATA	**Latitude** **Longitude** **Elevation** **Dates of relocation**
LOCAL ENVIRONMENT	**Local land use/land cover** **Instruments exposure** **Skyline diagrams**
STATION INSTRUMENTATION AND MAINTENANCE	**Instrument Sheltering and Mounting** **Type of recording** **Calibration results** **Special Maintenance/Faults**
DATA PROCESSING	**Units** **Special codes** **Algorithms** **Calculations** **QC applied? (yes/no)** **Homogenization applied? (yes/no)**
HISTORICAL EVENTS	**Changes in the social, political and institutional environment**

Metadata: station Identifiers, Geographical Data, Local Enviroment. An Extract from Exel sheet.

Archive Number	WMO Index	Station Name	Latitude	Longitude	Height (in m)	Time Period		
						Variable	Begin (month, year)	End (month, year)
820	16520	ALGHERO	40º 38´	8º 17´	40	Global	1.1964	6.1989
						Sunshine	1.1969	6.1989
814	16261	AMENDOLA	41º 32´	15º 43´	60	Global	1.1964	
						Sunshine	1.1969	

ALGHERO – **Description:** In a valley. Grassy and loamy ground.
Distance between the station and the nearest town, its position: 4,5 km, 166º

AMENDOLA – **Description:** Poorly grassy level ground.
Distance between the station and the nearest town, its position: 18 km, 240º

Metadata. Station Instrumentation and Maintenance

Station Name	Instrument Changes				
	Variable	Old Instrument	New Instrument	Date of Change	Reduction Coefficient
ALGHERO	Global	TB/R/	TB/R/	27.12.1965	
		TB/R/	TB/R/	08.11.1971	1,16
AMENDOLA	Global	TB/R/	TB/R/	09.02.1966	
		TB/R/	TB/R/	01.11.1971	1,22
		TB/R/	KZ/CM11/	1.07.1989	
		KZ/CM11/	?	?	

Metadata: Data Processing

Station Name	Changes of Units			WRR Scale	
	Old Units	New Units	Date of Changes	Date of Transfer	Coefficient of Transfer
ALGHERO	Cal/cm2	J/cm2	01.01.1980	1.11.1980	1.022
AMENDOLA	Cal/cm2	J/cm2	01.01.1980		

Metadata: Changes of Names, Locations

Station name	Change of Station Name		Change of Locaton		
	Old Name	Date of Change	Previous Latitude, Longitude Height	New Latitude, Longitude Height	Data of Change
OLBIA	OLBIA/ Town	8.09.1969	40º 56´, 9º 30´, 2 м	40º 52´, 9º 30´, 22 м	8.09.1969
	OLBIA/Venafiora	1.07.1974	40º 52´, 9º 30´, 22 м	40º 54´, 9º 31´, 13 м	1.07.1974
ROMA / CIAMPINO			41º48´,12º 36´, 131м	41º47´,12º 35´,105m	12.02.1991

GAWSIS 2.2 - Microsoft Internet Explorer

Файл Правка Вид Избранное Сервис Справка

Назад Поиск Избранное

Адрес: http://www.empa.ch/gaw/gawsis/default.asp Переход Ссылки

by QA/SAC Switzerland

GAWSIS

STATION INFORMATION SYSTEM

- Find Information
- Edit/Add Information
- Provide Feed-back

Home | Extended Search | Edit/Add Information | Feed-back | FAQs & Glossary | About | Logout | GAW IDs

QuickFind

Stations by Country

Individual Station Report

Contact Information

GO! Clear

GAW World Data Centres

WDCGG (Gases) WRDC (Radiation)

WOUDC (Ozone/UV) WDCA (Aerosols/AOD)

WDCPC (Precipitation)

GoogleEarth Port

Run gaw.kml for GoogleEarth access to GAWSIS!

What's New

2007-10-19 Under >Edit/Add Information<, GAWSIS users can chose **Bibliographic References** and provide a list of references to scientific ppapers, technical reports, etc.

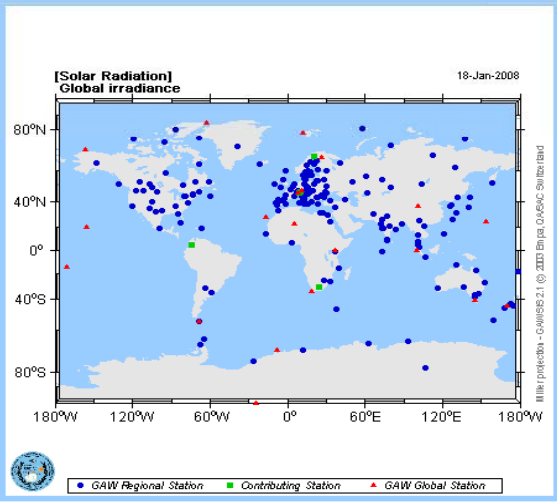
2007-08-15 The WDCGG database has been re-organized. The links from GAWSIS to WDCGG still point to the old database, but will be updated ASAP. We are sorry for the

Select by Station type

Global Regional Contributing

Select by Parameter

Refresh Reset



EMPA

QA/SAC Switzerland is hosted by the Swiss Federal Laboratories for Materials Testing and Research (EMPA), Dübendorf, Switzerland.
Funding provided by MeteoSwiss is greatfully acknowledged

MeteoSwiss

Интернет

пуск GAWSIS 2.2 - Mi... E:\DOC\SOVET\... Microsoft Power... EN 14:11

WRDC Metadata File Submitted to FTP- sever of GAWSIS

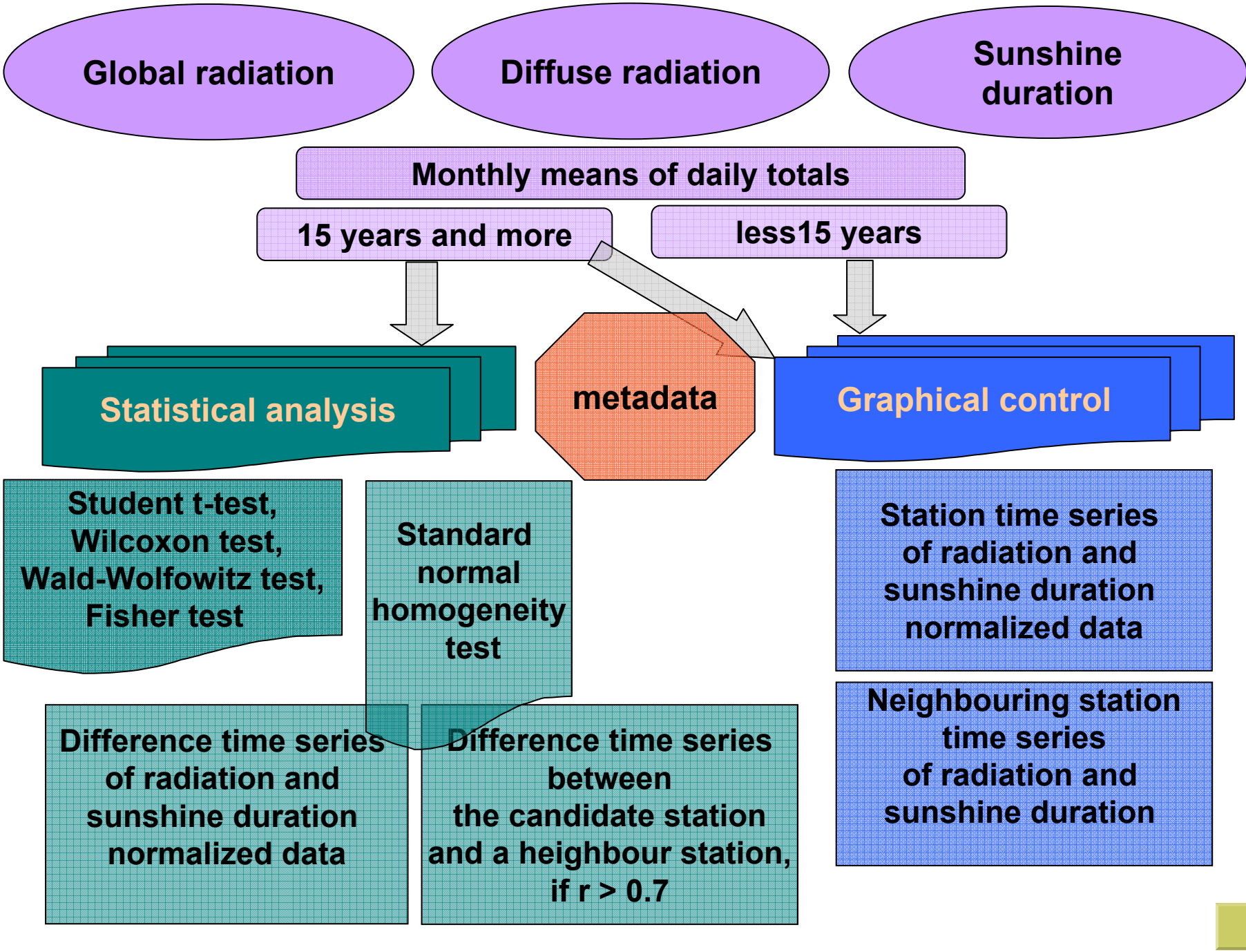
2007				IV	V	VI	VII	VIII	IX	X	XI	XII
Number of stations				241	241	241		243		243	244	244
Data of sending				17/04	15/05	15/06		31/08		15/10	23/11	14/12
2008	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Number of stations	244	244		244	244	244			246	246	246	246
Data of sending	16/01	26/02		10/04	15/05	16/06			25/09	31/10	19/11	25/12
2009	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Number of stations	246	246	246	246	247	247	247	227	227	227	227	227
Data of sending	21/01	24/02	19/03	21/04	15/05	29/06	29/07	11/08	16/09	22/10	16/11	16/12
2010	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Number of stations	227	227	227	229								
Data of sending	18/01	18/02	23/03	20/04								

Table updated on 11.08.2009: 56 stations excluded, 36 stations added (as in the list of stations of GAWSIS)

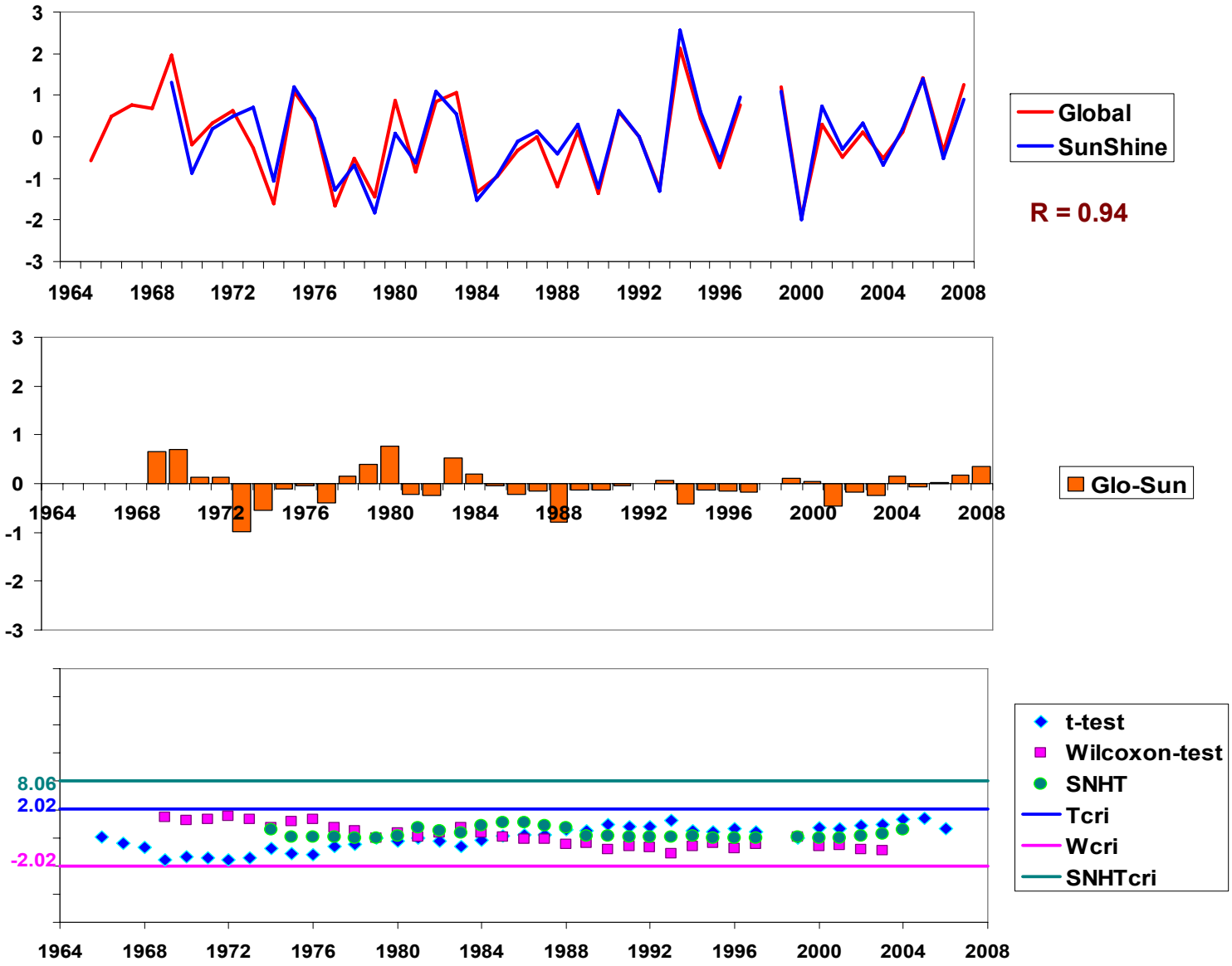
Quality Checks at the WRDC

- *Physically meaningful limits*
- *Follow up Control according to WRDC procedures applied to daily and monthly totals*
- *Checks of calculated and actual totals*
- *Checks of hourly and daily values in the within setup ranges*
- *Control of exceedings above TOA values*
- *Control of values higher than those of probabilistic and climatological levels*
- *Control of correlation: data of neighbour sites*

- ***Homogeneity Analysis (HA)***


Global radiation
Diffuse radiation
Sunshine duration
Monthly means of daily totals
15 years and more
less15 years
Statistical analysis
metadata
Graphical control
Student t-test, Wilcoxon test, Wald-Wolfowitz test, Fisher test
Standard normal homogeneity test
Station time series of radiation and sunshine duration normalized data
Neighbouring station time series of radiation and sunshine duration
Difference time series of radiation and sunshine duration normalized data
Difference time series between the candidate station and a heighbour station, if r > 0.7

HA: Stockholm (Sweden), July



Homogeneous series

Calculation of Anomalies:

$$\Delta G_j = (G_j - \overline{G}) / S_G \quad (1)$$

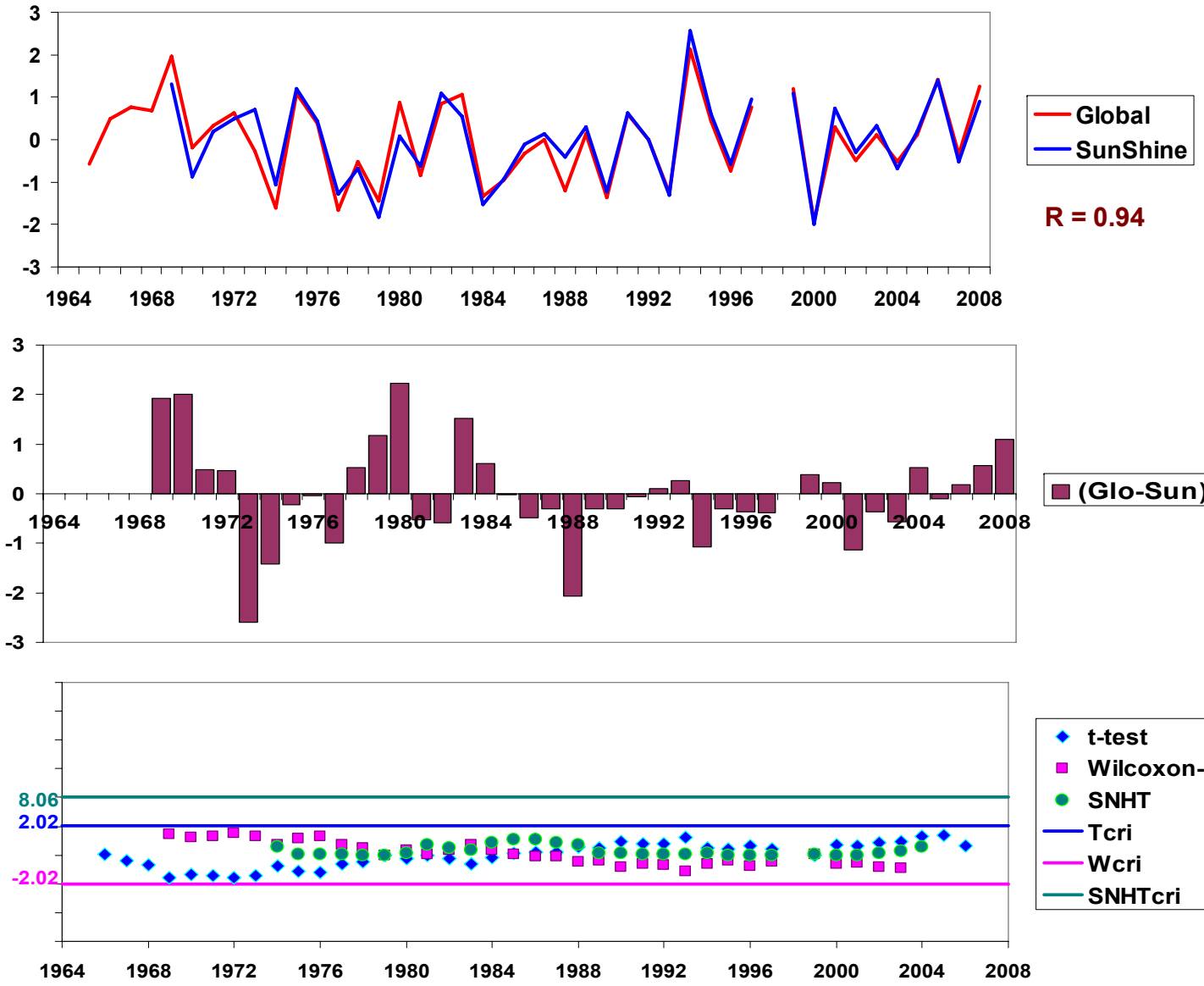
$$\Delta SS_j = (SS_j - \overline{SS}) / S_{SS} \quad (2)$$

$$\delta(G_j SS_j) = \Delta G_J - \Delta SS_J \quad (3)$$

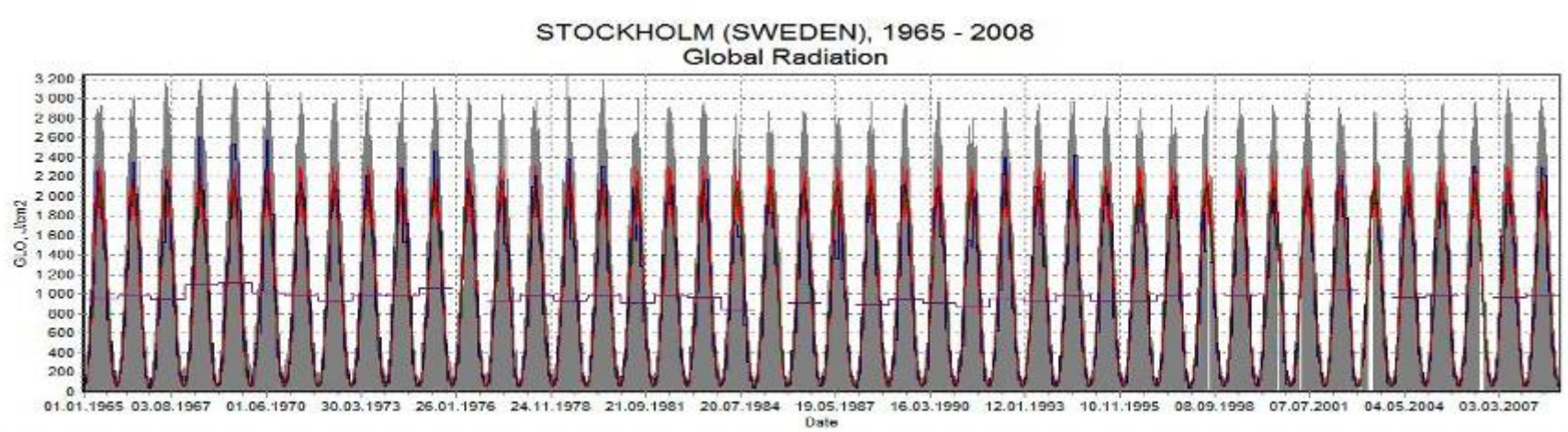
$$\Delta(G_J SS_J) = (\delta(G_J SS_J) - \overline{\delta(G_J SS_J)} / S_{\delta GSS} \quad (4)$$

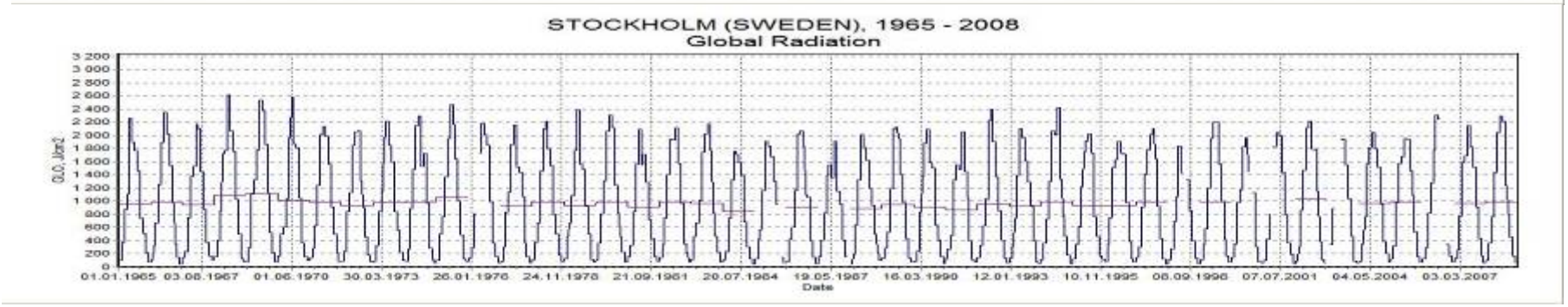
NOTE: The standard normal homogeneity test (SNHT) was developed and applied to precipitation data by Alexandersson (1984, 1986).

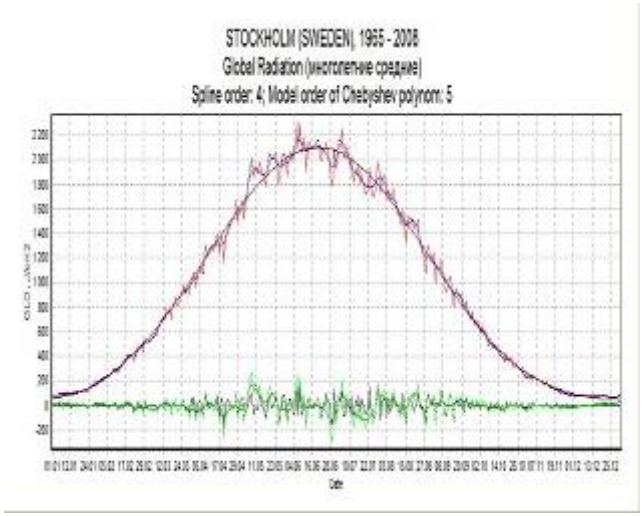
HA: Stockholm (Sweden), July



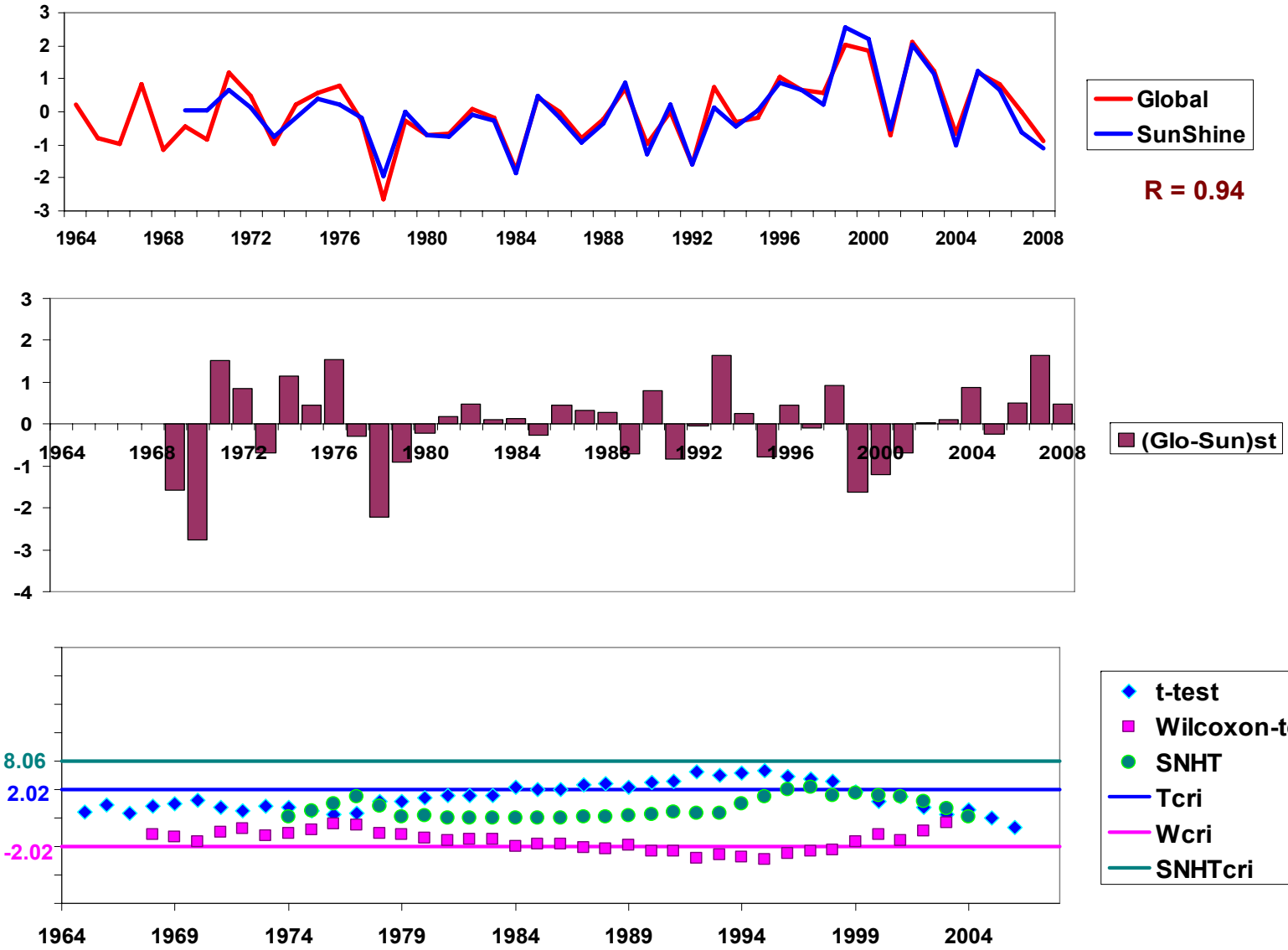
Homogeneous series


STOCKHOLM (SWEDEN), 1965 - 2008
Global Radiation
G,D, J/cm2
3 200
3 000
2 800
2 600
2 400
2 200
2 000
1 800
1 600
1 400
1 200
1 000
800
600
400
200
0
01.01.1965 03.08.1967 01.06.1970 30.03.1973 26.01.1976 24.11.1978 21.09.1981 20.07.1984 19.05.1987 16.03.1990 12.01.1993 10.11.1995 08.09.1998 07.07.2001 04.05.2004 03.03.2007
Date


STOCKHOLM (SWEDEN), 1965 - 2008
Global Radiation
G,D, J/cm2
3 200
3 000
2 800
2 600
2 400
2 200
2 000
1 800
1 600
1 400
1 200
1 000
800
600
400
200
0
01.01.1965 03.08.1967 01.06.1970 30.03.1973 26.01.1976 24.11.1978 21.09.1981 20.07.1984 19.05.1987 16.03.1990 12.01.1993 10.11.1995 08.09.1998 07.07.2001 04.05.2004 03.03.2007
Date

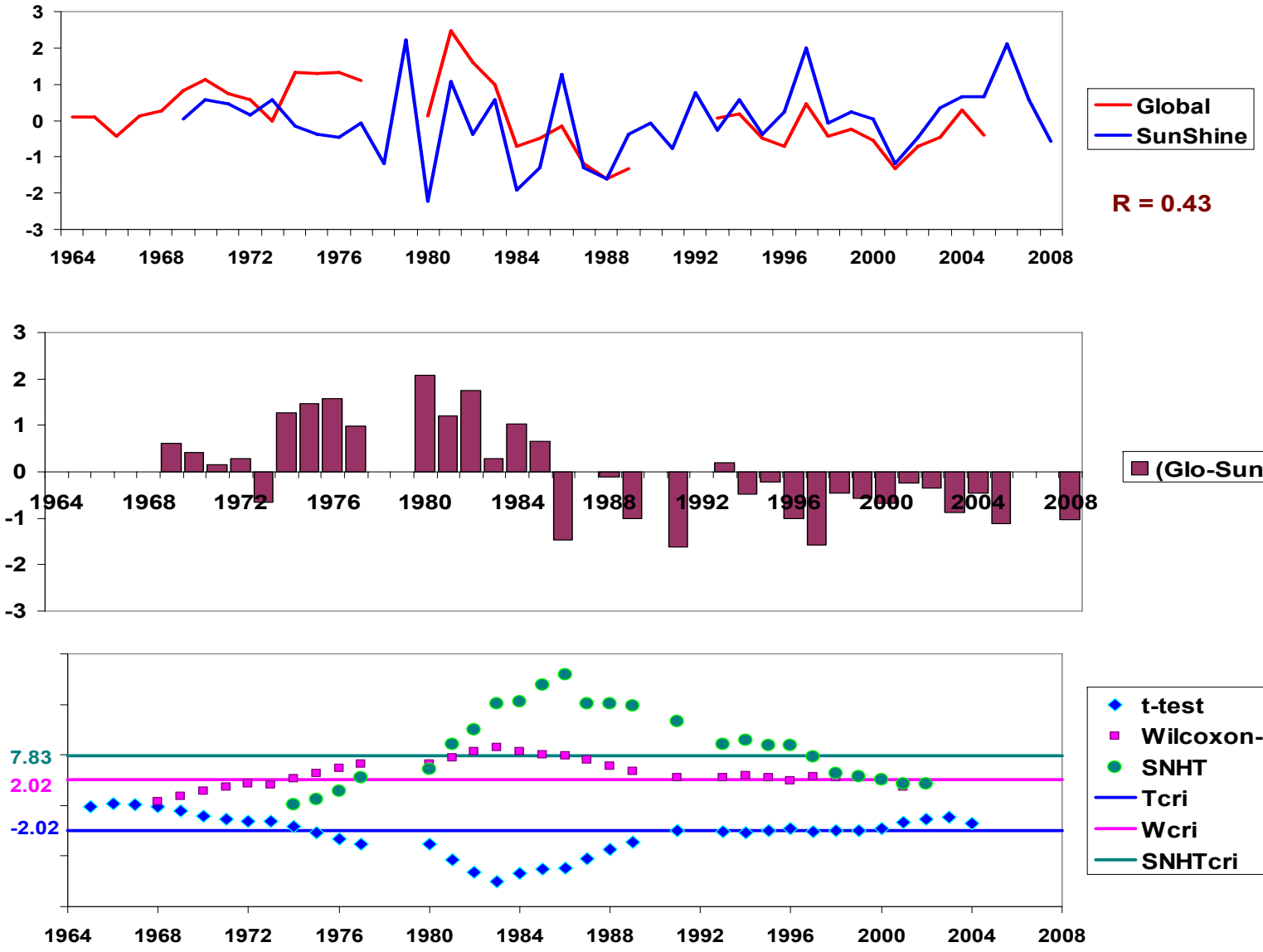

STOCKHOLM (SWEDEN), 1965 - 2008
Global Radiation (многолетние средние)
Spline order: 4; Model order of Chebyshev polynom: 5

HA: Jokioinen (Finland), September



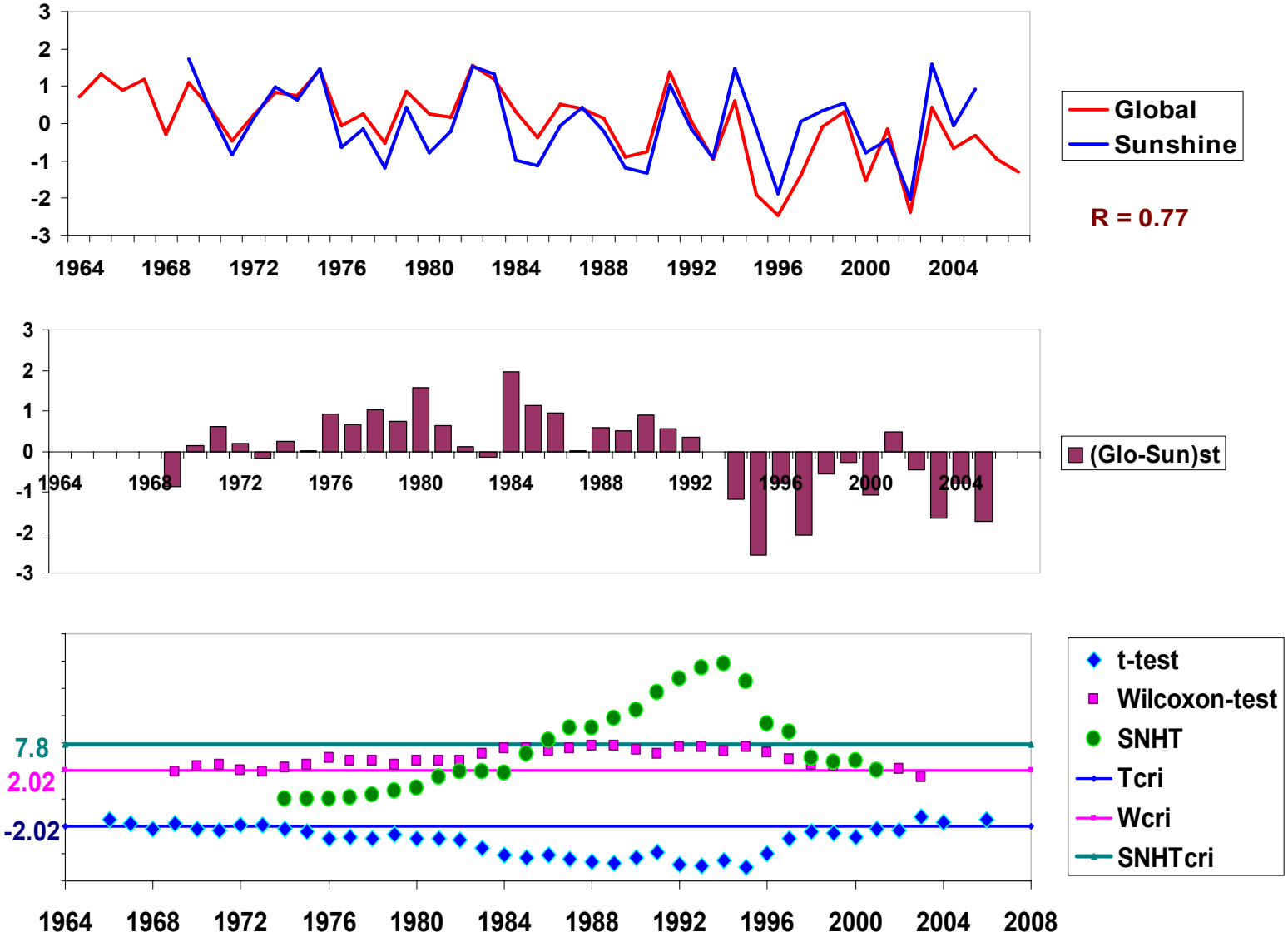
Climate variations

HA: Roma / Ciampino (Italy), May

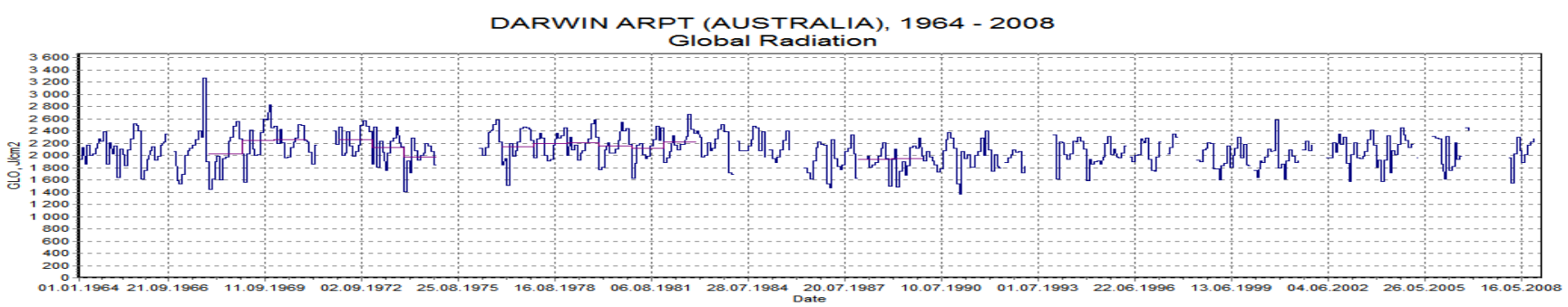


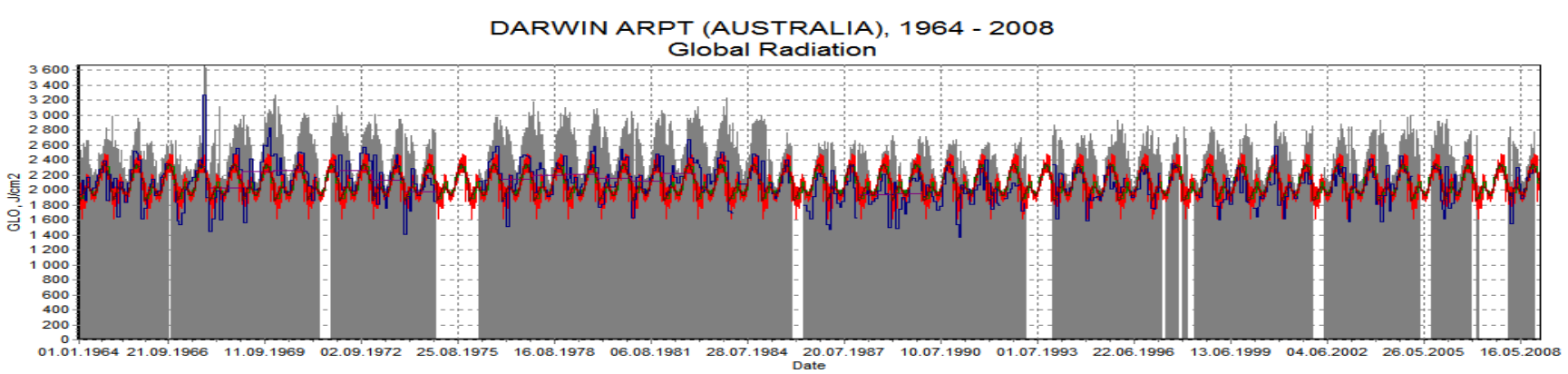
Instrument change, relocation: Jul 1989 – TB/R/ →KZ/CM11/

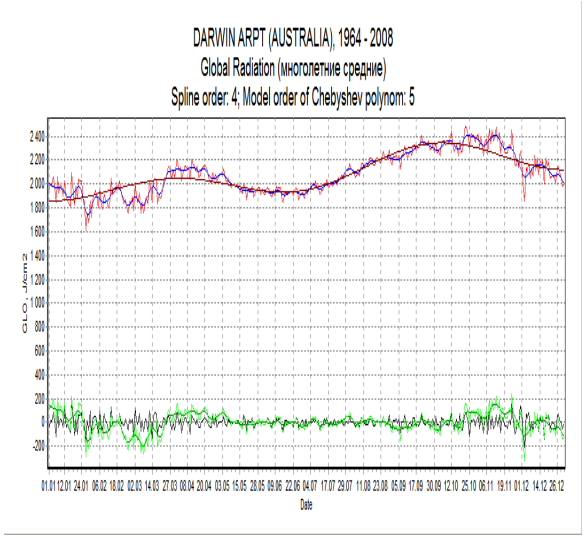
HA: Kiev / Borispol (Ukraine), September



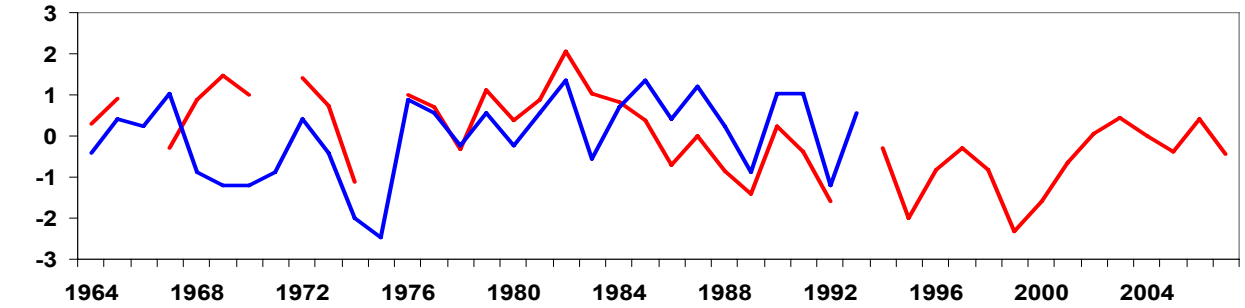
Feb1992 – Methodical change (переход на срочные наблюдения)


DARWIN ARPT (AUSTRALIA), 1964 - 2008
Global Radiation
GLO, J/cm2
3 600
3 400
3 200
3 000
2 800
2 600
2 400
2 200
2 000
1 800
1 600
1 400
1 200
1 000
800
600
400
200
0
01.01.1964 21.09.1966 11.09.1969 02.09.1972 25.08.1975 16.08.1978 06.08.1981 28.07.1984 20.07.1987 10.07.1990 01.07.1993 22.06.1996 13.06.1999 04.06.2002 26.05.2005 16.05.2008
Date

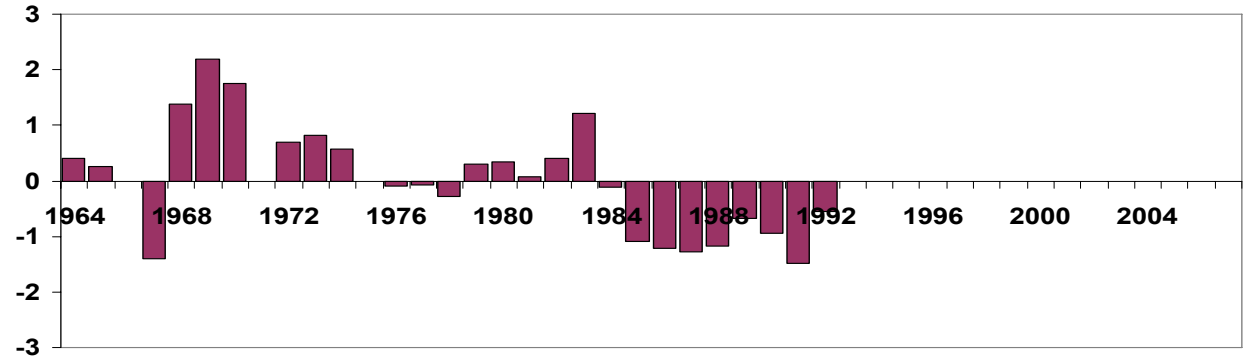

DARWIN ARPT (AUSTRALIA), 1964 - 2008
Global Radiation
GLO, J/cm2
3 600
3 400
3 200
3 000
2 800
2 600
2 400
2 200
2 000
1 800
1 600
1 400
1 200
1 000
800
600
400
200
0
01.01.1964 21.09.1966 11.09.1969 02.09.1972 25.08.1975 16.08.1978 06.08.1981 28.07.1984 20.07.1987 10.07.1990 01.07.1993 22.06.1996 13.06.1999 04.06.2002 26.05.2005 16.05.2008
Date

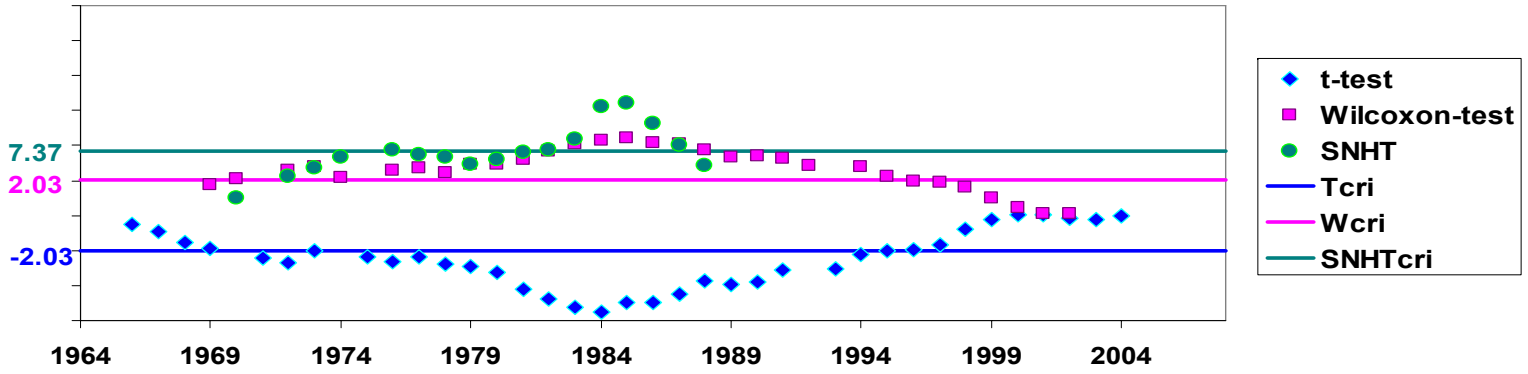

DARWIN ARPT (AUSTRALIA), 1964 - 2008
Global Radiation (многолетние средние)
Spline order: 4; Model order of Chebyshev polynom: 5
GLO, J/cm2
Date

HA: Darwin arpt (Australia), October



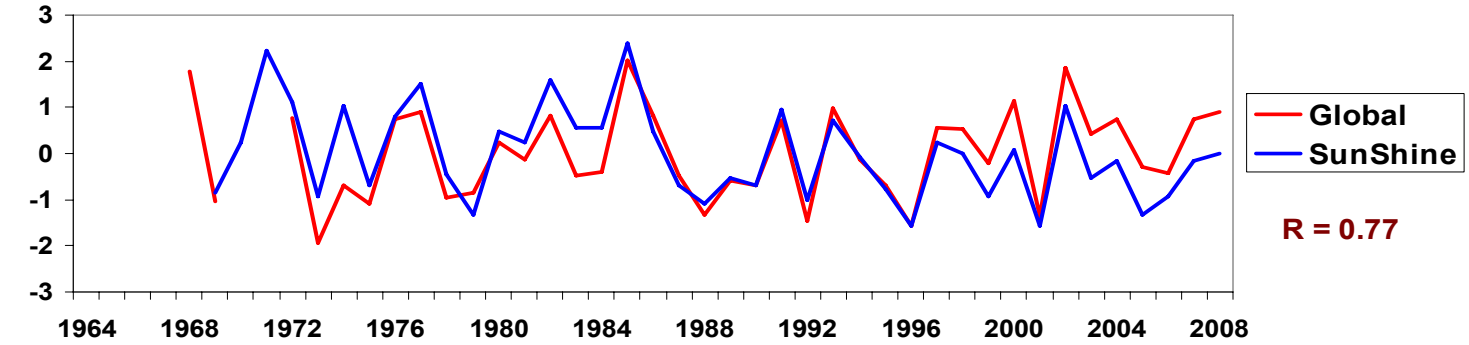
R = 0.56

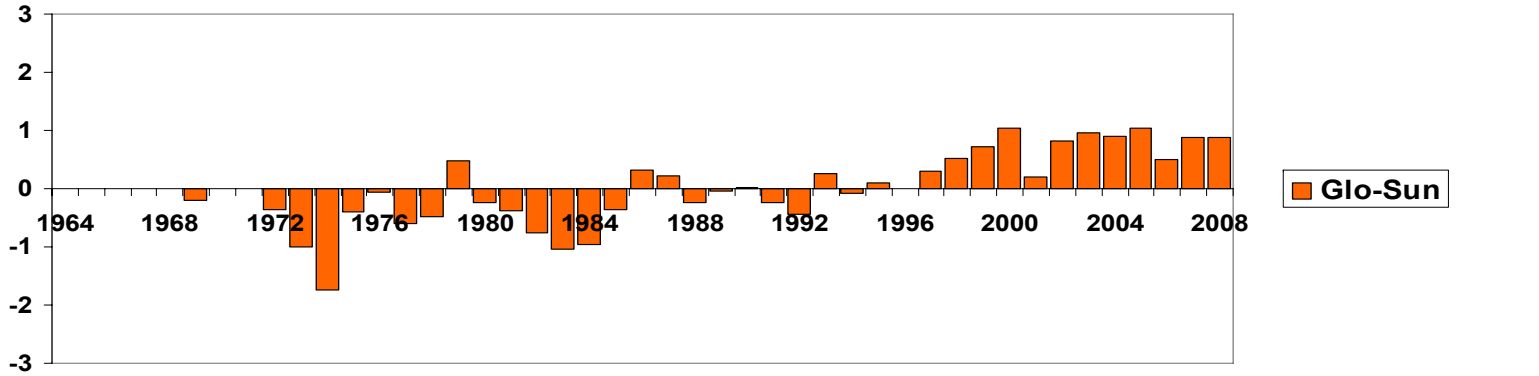


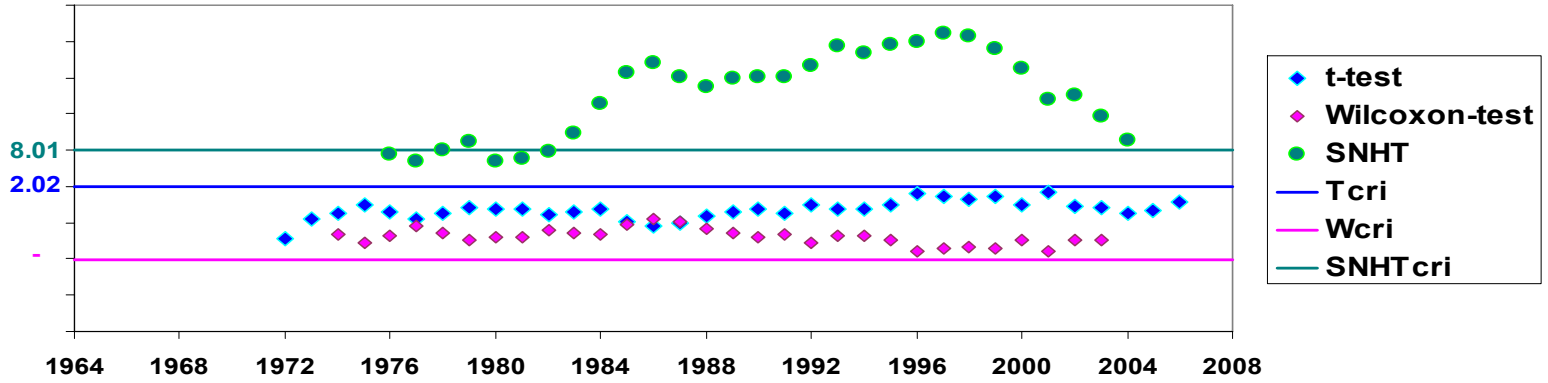


Unknown cause of non-homogeneity

HA: Naha (Japan), May

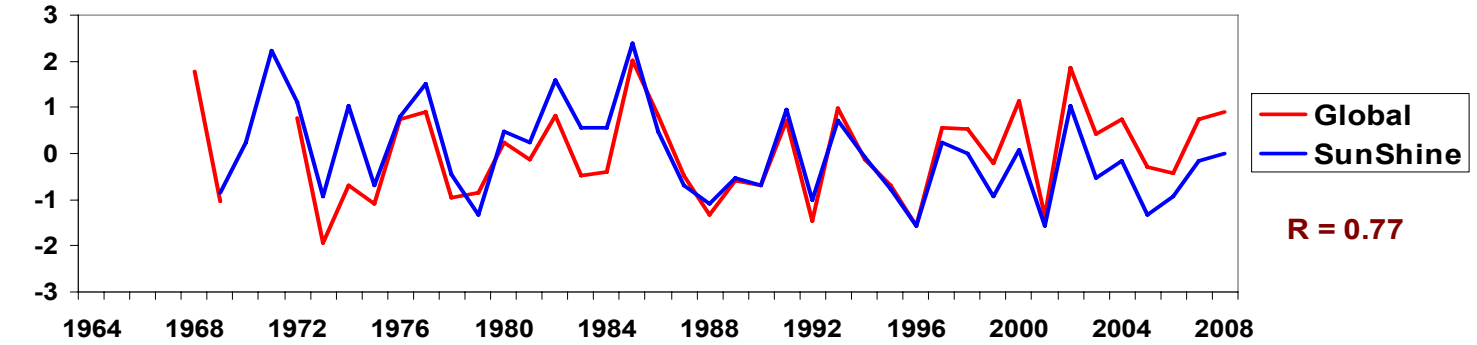


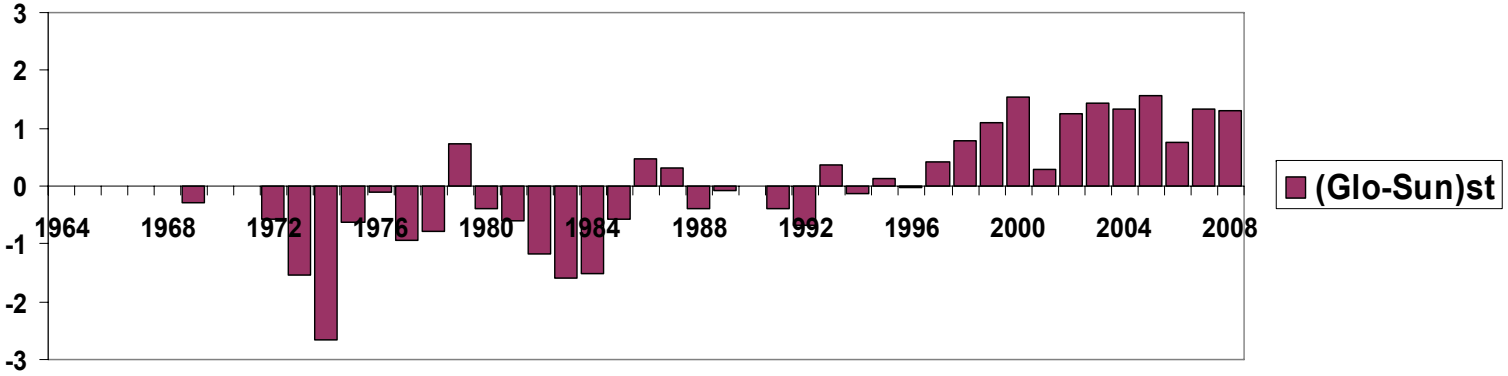


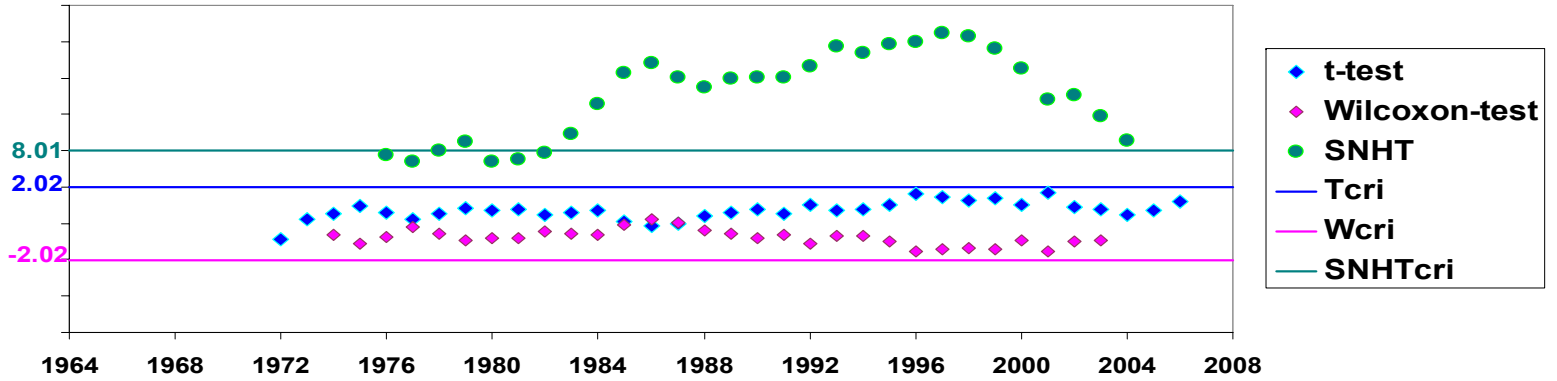


Instrument change: Jan 1986 – SS/J/ →SS/EKO/, Dec 1999 – TT/EKO/ → KZ/CM21/

HA: Naha (Japan), May

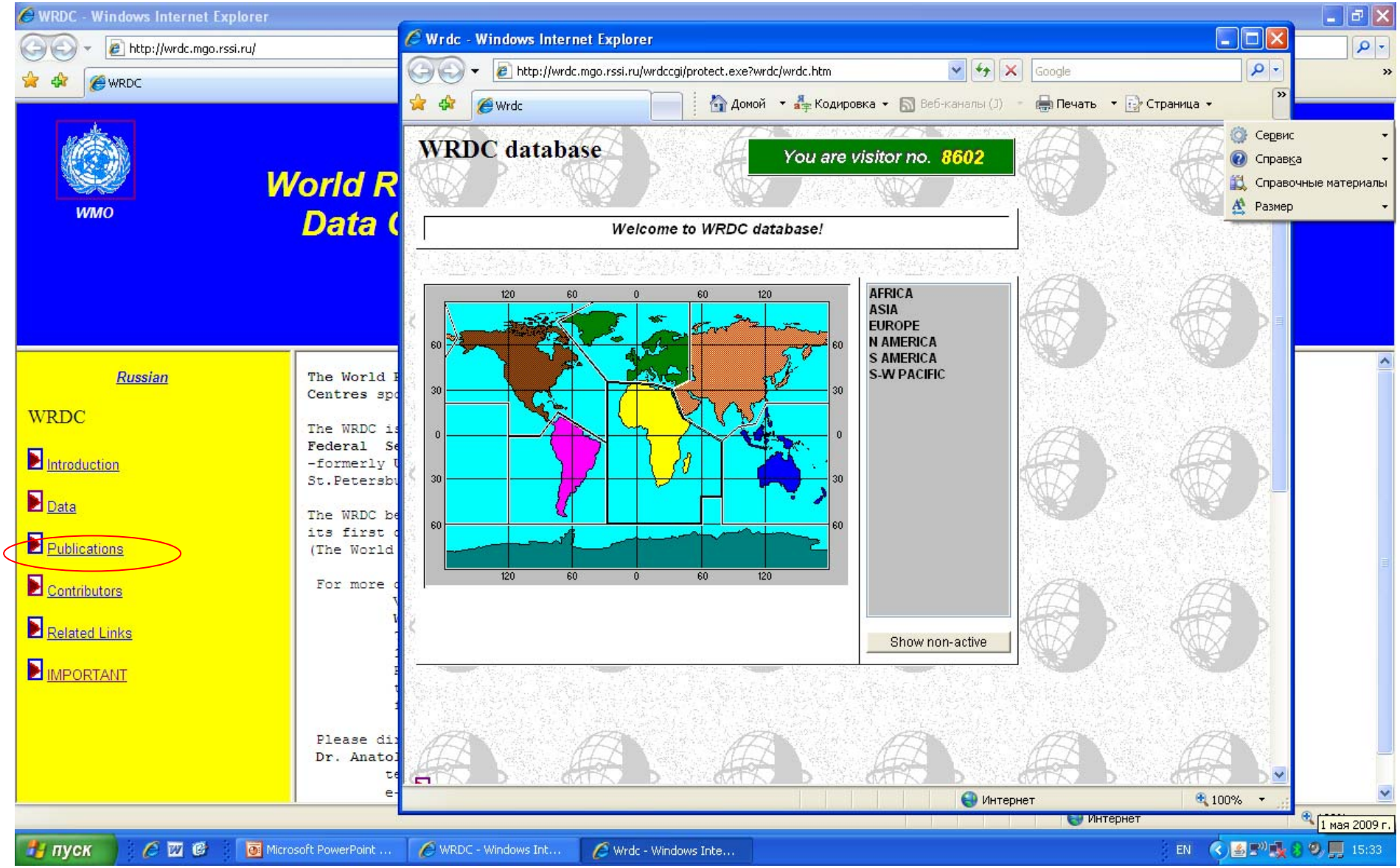






Instrument change: Jan 1986 – SS/J/ →SS/EKO/, Dec 1999 – TT/EKO/ → KZ/CM21/

Access to the WRDC Data: Recent *Updates*


WRDC - Windows Internet Explorer
http://wrdc.mgo.rssi.ru/
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WMO
World R
Data C
Russian
WRDC
Introduction
Data
Publications
Contributors
Related Links
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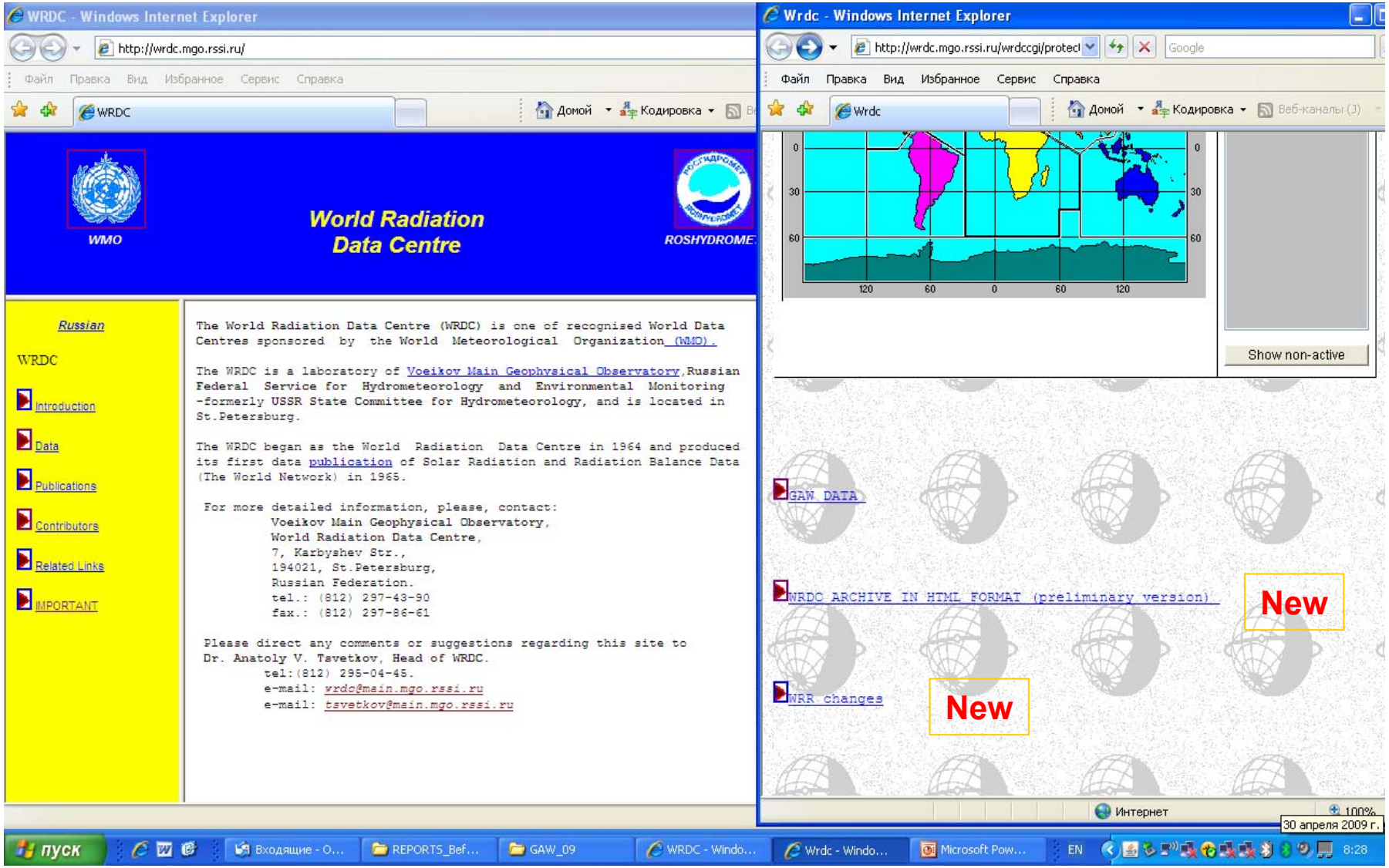
The World
Centres sp
The WRDC is
Federal Se
-formerly
St.Petersb
The WRDC be
its first
(The World
For more
Please di
Dr. Anatol
Wrdc - Windows Internet Explorer
http://wrdc.mgo.rssi.ru/wrdccgi/protect.exe?wrdc/wrdc.htm
Google
Wrdc
Домой
Кодировка
Веб-каналы (J)
Печать
Страница
Сервис
Справка
Справочные материалы
Размер
WRDC database
You are visitor no. 8602
Welcome to WRDC database!
120 60 0 60 120
60
30
0
30
60
AFRICA
ASIA
EUROPE
N AMERICA
S AMERICA
S-W PACIFIC
Show non-active
Интернет
100%
Интернет
1 мая 2009 г.
пуск
Microsoft PowerPoint ...
WRDC - Windows Int...
Wrdc - Windows Inte...
EN
15:33


WRDC - Windows Internet Explorer
http://wrdc.mgo.rssi.ru/
WRDC
WMO
World Radiation Data Centre
ROSHYDROMET
Russian
WRDC
Introduction
Data
Publications
Contributors
Related Links
IMPORTANT
The World Radiation Data Centre (WRDC) is one of recognised World Data Centres sponsored by the World Meteorological Organization (WMO).
The WRDC is a laboratory of Voeikov Main Geophysical Observatory, Russian Federal Service for Hydrometeorology and Environmental Monitoring -formerly USSR State Committee for Hydrometeorology, and is located in St.Petersburg.
The WRDC began as the World Radiation Data Centre in 1964 and produced its first data publication of Solar Radiation and Radiation Balance Data (The World Network) in 1965.
For more detailed information, please, contact:
Voeikov Main Geophysical Observatory,
World Radiation Data Centre,
7, Karbyshev Str.,
194021, St.Petersburg,
Russian Federation.
tel.: (812) 297-43-90
fax.: (812) 297-86-61
Please direct any comments or suggestions regarding this site to
Dr. Anatoly V. Tsvetkov, Head of WRDC.
tel:(812) 295-04-45.
e-mail: wrdc@main.mgo.rssi.ru
e-mail: tsvetkov@main.mgo.rssi.ru
Wrdc - Windows Internet Explorer
http://wrdc.mgo.rssi.ru/wrdccgi/protecl
Show non-active
GAW DATA
WRDC ARCHIVE IN HTML FORMAT (preliminary version)
New
WRR changes
New
Интернет
30 апреля 2009 г.
пуск
8:28

HOME

GAW

STATIONS

ALGERIA

Tamanrasset

Daily data

Hourly data

ARGENTINA

Ushuaia

Daily data

Hourly data

AUSTRALIA

Cape Grim

Daily data

Hourly data

AUSTRALIA

Darwin Arpt

Daily data

Hourly data

INFORMATION ON GAW STATIONS

STATION TAMANRASSET (global GAW station)

STATION USHUAIA (global GAW station)

STATION CAPE GRIM (global GAW station)

STATION DARWIN ARPT (regional GAW station)

STATION MELBOURNE ARPT (regional GAW station)

STATION WAGGA WAGGA AMO (regional GAW station)

STATION SONNBLICK (global GAW station)

STATION WIEN / HOHE WARTE (regional GAW station)

STATION TARTU-TORAVERE (contributing GAW station)

STATION THESSALONIKI (regional GAW station)

STATION BUKIT KOTOTABANG (global GAW station)

STATION MOUNT KENYA (global GAW station)

STATION RUCAVA (regional GAW station)

STATION ZILANI (contributing GAW station)

STATION ZOSENI (regional GAW station)

STATION KISHINEV (regional GAW station)

STATION POPRAD GANOVCE (regional GAW station)

STATION DAVOS-DORF (contributing GAW station)

STATION JUNGFRAUJOCH (global GAW station)

STATION PAYERNE (regional GAW station)

STATION LOCARNO-MONTI (contributing GAW station)

STATION CAMBORNE (regional GAW station)

STATION LERWICK (regional GAW station)

STATION BONDVILLE (regional GAW station)

STATION BOULDER / TABLE MOUNTAIN (contributing GAW station)

AUSTRALIA

Wagga Wagga AMO

Daily data

Hourly data

AUSTRIA

Sonnblick

Daily data

Hourly data

AUSTRIA

Wien / Hohe Warte

Daily data

Hourly data

ESTONIA

Tartu-Toravere

Daily data

Hourly data

Skyline

GREECE

Thessaloniki

Daily data

Station Information:

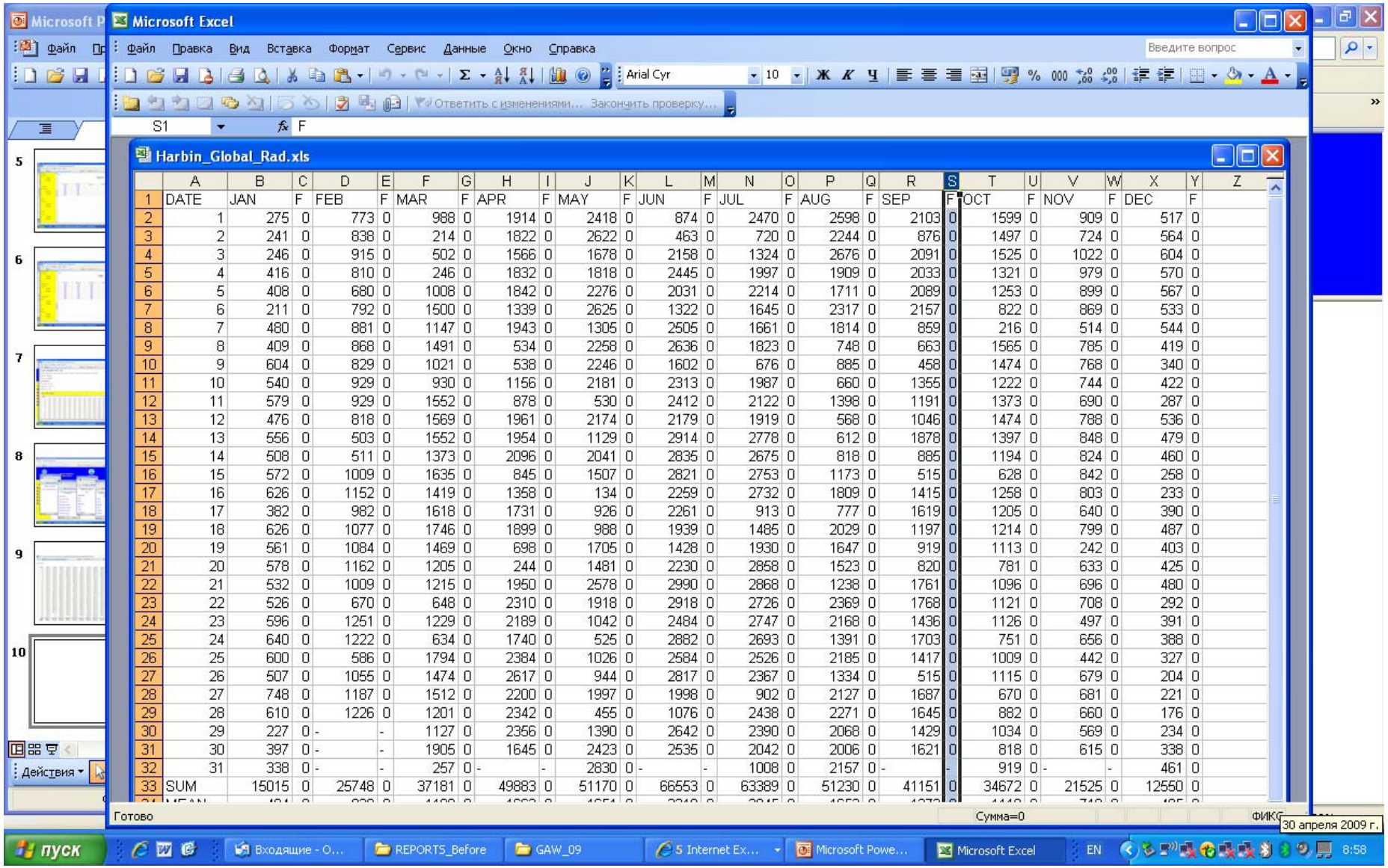
Name: Wien / Hohe Warte
WMO index: 11035
Latitude: 48.25 N
Longitude: 16.35 W
Elevation (m): 203
Time: Local mean time, local time offset from GMT: +1.0
Instrumentation:
Global Horizontal Q: Star pyranometer heated, manufacturer Schenk
Diffuse horizontal D: Star pyranometer heated, manufacturer Schenk in combination with a radiation screen

Contributor:
Wolfgang Lipa
Climate and Weather Information
ZAMG
Hohe Warte 38
A-1190 Vienna
Austria

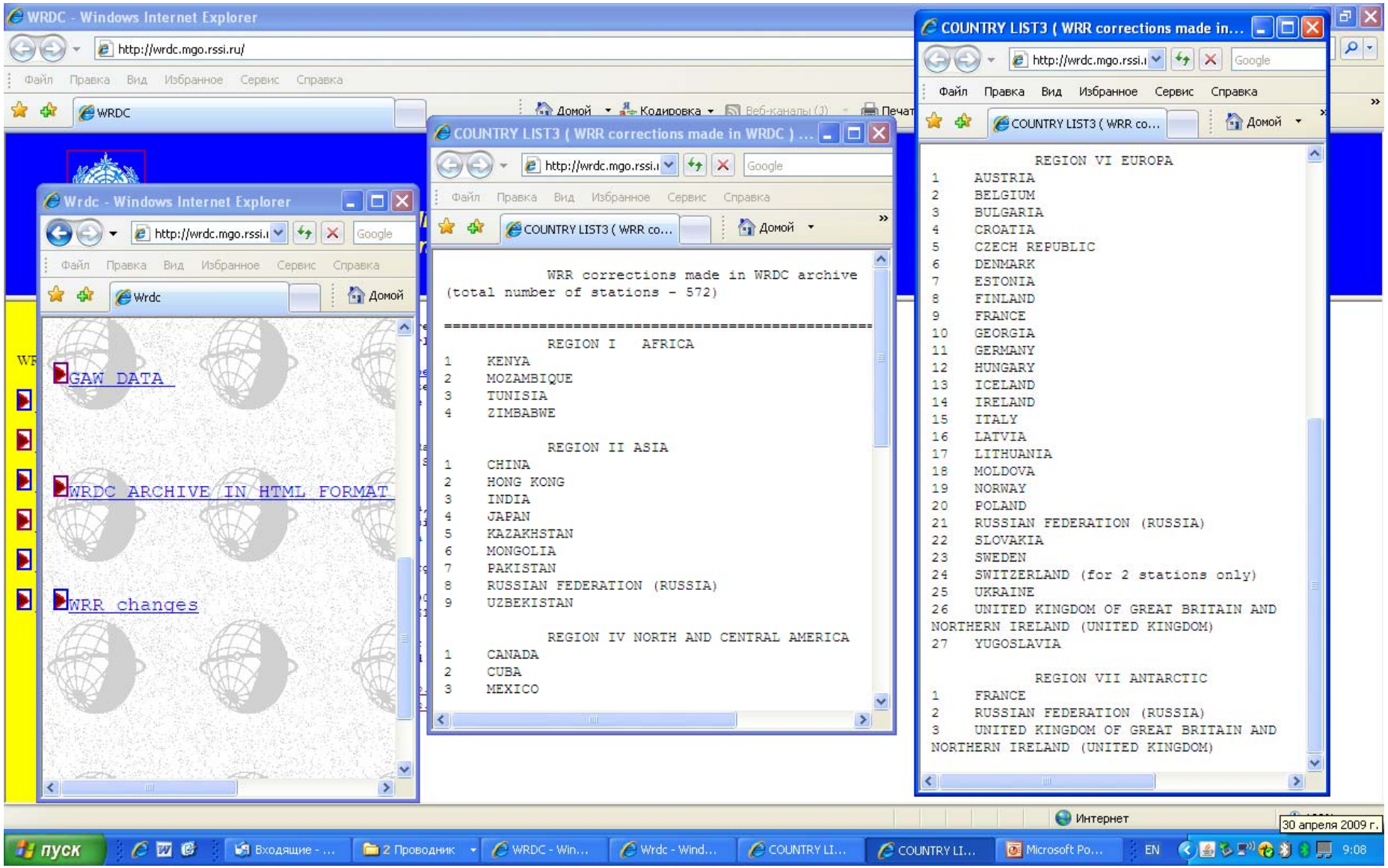
Daily and monthly averages in J/cm² are computed according to WRDC protocol (and subject to rejection by the flagging protocol):

- Daily total values are the total of each hourly irradiance for the day
- Monthly averages are the sum of the daily values divided by the number of days available
- Monthly totals are the monthly average multiplied by the number of calendar days in the month
- Monthly statistics for hourly intervals are the sum and average of the hourly interval for each day under a process similar to the monthly averages and totals above.

flag (F) = 0 (blank in the table) means that a value has good quality flag = 1 - questionable value flag = 2 - bad or missing value



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	DATE	JAN	F	FEB	F	MAR	F	APR	F	MAY	F	JUN	F	JUL	F	AUG	F	SEP	F	OCT	F	NOV	F	DEC	F	
2	1	275	0	773	0	988	0	1914	0	2418	0	874	0	2470	0	2598	0	2103	0	1599	0	909	0	517	0	
3	2	241	0	838	0	214	0	1822	0	2622	0	463	0	720	0	2244	0	876	0	1497	0	724	0	564	0	
4	3	246	0	915	0	502	0	1566	0	1678	0	2158	0	1324	0	2676	0	2091	0	1525	0	1022	0	604	0	
5	4	416	0	810	0	246	0	1832	0	1818	0	2445	0	1997	0	1909	0	2033	0	1321	0	979	0	570	0	
6	5	408	0	680	0	1008	0	1842	0	2276	0	2031	0	2214	0	1711	0	2089	0	1253	0	899	0	567	0	
7	6	211	0	792	0	1500	0	1339	0	2625	0	1322	0	1645	0	2317	0	2157	0	822	0	869	0	533	0	
8	7	480	0	881	0	1147	0	1943	0	1305	0	2505	0	1661	0	1814	0	859	0	216	0	514	0	544	0	
9	8	409	0	868	0	1491	0	534	0	2258	0	2636	0	1823	0	748	0	663	0	1565	0	785	0	419	0	
10	9	604	0	829	0	1021	0	538	0	2246	0	1602	0	676	0	885	0	458	0	1474	0	768	0	340	0	
11	10	540	0	929	0	930	0	1156	0	2181	0	2313	0	1987	0	660	0	1355	0	1222	0	744	0	422	0	
12	11	579	0	929	0	1552	0	878	0	530	0	2412	0	2122	0	1398	0	1191	0	1373	0	690	0	287	0	
13	12	476	0	818	0	1569	0	1961	0	2174	0	2179	0	1919	0	568	0	1046	0	1474	0	788	0	536	0	
14	13	556	0	503	0	1552	0	1954	0	1129	0	2914	0	2778	0	612	0	1878	0	1397	0	848	0	479	0	
15	14	508	0	511	0	1373	0	2096	0	2041	0	2835	0	2675	0	818	0	885	0	1194	0	824	0	460	0	
16	15	572	0	1009	0	1635	0	845	0	1507	0	2821	0	2753	0	1173	0	515	0	628	0	842	0	258	0	
17	16	626	0	1152	0	1419	0	1358	0	134	0	2259	0	2732	0	1809	0	1415	0	1258	0	803	0	233	0	
18	17	382	0	982	0	1618	0	1731	0	926	0	2261	0	913	0	777	0	1619	0	1205	0	640	0	390	0	
19	18	626	0	1077	0	1746	0	1899	0	988	0	1939	0	1485	0	2029	0	1197	0	1214	0	799	0	487	0	
20	19	561	0	1084	0	1469	0	698	0	1705	0	1428	0	1930	0	1647	0	919	0	1113	0	242	0	403	0	
21	20	578	0	1162	0	1205	0	244	0	1481	0	2230	0	2858	0	1523	0	820	0	781	0	633	0	425	0	
22	21	532	0	1009	0	1215	0	1950	0	2578	0	2990	0	2868	0	1238	0	1761	0	1096	0	696	0	480	0	
23	22	526	0	670	0	648	0	2310	0	1918	0	2918	0	2726	0	2369	0	1768	0	1121	0	708	0	292	0	
24	23	596	0	1251	0	1229	0	2189	0	1042	0	2484	0	2747	0	2168	0	1436	0	1126	0	497	0	391	0	
25	24	640	0	1222	0	634	0	1740	0	525	0	2882	0	2693	0	1391	0	1703	0	751	0	656	0	388	0	
26	25	600	0	586	0	1794	0	2384	0	1026	0	2584	0	2526	0	2185	0	1417	0	1009	0	442	0	327	0	
27	26	507	0	1055	0	1474	0	2617	0	944	0	2817	0	2367	0	1334	0	515	0	1115	0	679	0	204	0	
28	27	748	0	1187	0	1512	0	2200	0	1997	0	1998	0	902	0	2127	0	1687	0	670	0	681	0	221	0	
29	28	610	0	1226	0	1201	0	2342	0	455	0	1076	0	2438	0	2271	0	1645	0	882	0	660	0	176	0	
30	29	227	0	-	-	1127	0	2356	0	1390	0	2642	0	2390	0	2068	0	1429	0	1034	0	569	0	234	0	
31	30	397	0	-	-	1905	0	1645	0	2423	0	2535	0	2042	0	2006	0	1621	0	818	0	615	0	338	0	
32	31	338	0	-	-	257	0	-	-	2830	0	-	-	1008	0	2157	0	-	-	919	0	-	-	461	0	
33	SUM	15015	0	25748	0	37181	0	49883	0	51170	0	66553	0	63389	0	51230	0	41151	0	34672	0	21525	0	12550	0	


WRDC - Windows Internet Explorer
http://wrdc.mgo.rssi.ru/
Файл Правка Вид Избранное Сервис Справка
WRDC
Домой
Кодировка
Печать
Wrdc - Windows Internet Explorer
http://wrdc.mgo.rssi.ru/
Google
Файл Правка Вид Избранное Сервис Справка
Wrdc
Домой
GAW DATA
WRDC ARCHIVE IN HTML FORMAT
WRR changes
COUNTRY LIST3 (WRR corrections made in WRDC) ...
http://wrdc.mgo.rssi.ru/
Google
Файл Правка Вид Избранное Сервис Справка
COUNTRY LIST3 (WRR co...
Домой
WRR corrections made in WRDC archive
(total number of stations - 572)
REGION I AFRICA
1 KENYA
2 MOZAMBIQUE
3 TUNISIA
4 ZIMBABWE
REGION II ASIA
1 CHINA
2 HONG KONG
3 INDIA
4 JAPAN
5 KAZAKHSTAN
6 MONGOLIA
7 PAKISTAN
8 RUSSIAN FEDERATION (RUSSIA)
9 UZBEKISTAN
REGION IV NORTH AND CENTRAL AMERICA
1 CANADA
2 CUBA
3 MEXICO
COUNTRY LIST3 (WRR corrections made in...
http://wrdc.mgo.rssi.ru/
Google
Файл Правка Вид Избранное Сервис Справка
COUNTRY LIST3 (WRR co...
Домой
REGION VI EUROPA
1 AUSTRIA
2 BELGIUM
3 BULGARIA
4 CROATIA
5 CZECH REPUBLIC
6 DENMARK
7 ESTONIA
8 FINLAND
9 FRANCE
10 GEORGIA
11 GERMANY
12 HUNGARY
13 ICELAND
14 IRELAND
15 ITALY
16 LATVIA
17 LITHUANIA
18 MOLDOVA
19 NORWAY
20 POLAND
21 RUSSIAN FEDERATION (RUSSIA)
22 SLOVAKIA
23 SWEDEN
24 SWITZERLAND (for 2 stations only)
25 UKRAINE
26 UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND (UNITED KINGDOM)
27 YUGOSLAVIA
REGION VII ANTARCTIC
1 FRANCE
2 RUSSIAN FEDERATION (RUSSIA)
3 UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND (UNITED KINGDOM)
Интернет
30 апреля 2009 г.
пуск
Входящие - ...
2 Проводник
WRDC - Win...
Wrdc - Wind...
COUNTRY LI...
COUNTRY LI...
Microsoft Po...
EN
9:08

Global Radiation (Africa). Daily sums, monthly means and totals.

AFRICA

ALGERIA

ANGOLA

BURKINA FASO

CAPE VERDE

CAR

DJIBOUTI

EGYPT

ETHIOPIA

GAMBIA

GHANA

GUINEA-BISSAU

KENYA

MADAGASCAR

MADEIRA

MALI

MOROCCO

MOZAMBIQUE

NAMIBIA

NIGER

NIGERIA

RSA

Global Radiation (Africa). Daily sums, monthly means and totals.

MOZAMBIQUE

PEMBA

LICHINGA

LUMBO

NAMPULA

GURUE

TETE

MOCUBA

QUELIMANE

CHIMOIO

BEIRA

CHICUALACUALA

INHAMBANE

CHOKWE

MANIQUENIQUE

XAI-XAI

BOBOLE

MAPUTO / MAVALANE

MAPUTO

UMBELUZI

Global Radiation (Africa). Daily sums, monthly means and totals.

BEIRA

WMO Index: 67297

Latitude: 19°48'S

Longitude: 34°54'E

Elevation: 0010

Instrumentation:

- global Radiation: KZ/CM6B/

- sunshine duration: SS/C/

- diffuse Radiation: KZ/CM5/

Data available

1964 1965 1966 1967 1968 1969 1970 1971 1972 1973

1974 1975 1976 1977 1978 1979 1980 1981 1982 1983

1984 1985 1986 1987 1988 1989 1990 1991 1992 1993

1994 1995 1996 1997 1998 1999 2000 2001 2002

Longitude =34°54'E

Elevation = 10

WMO Identifier: 67297

Year 1964

DATE	JAN	F	FEB	F	MAR	F	APR	F	MAY	F	JUN	F	JUL	F	AUG	F	SEP	F	OCT	F	NOV	F	DEC	F
1	2319	0	2734	0	2452	0	2340	0	1717	0	1781	0	1769	0	1912	0	2137	0	2370	0	2422	0	3075	0
2	1903	0	1937	0	2612	0	2020	0	1929	0	1795	0	1579	0	1963	0	2158	0	1544	0	2228	0	2980	0
3	1362	0	1583	0	2734	0	2063	0	1362	0	1786	0	1777	0	1985	0	2361	0	2392	0	2721	0	2677	0
4	1894	0	752	0	2734	0	1777	0	925	0	1765	0	1691	0	1605	0	2327	0	2016	0	2725	0	3170	0
5	1656	0	778	0	2820	0	1540	0	1743	0	1765	0	1704	0	1656	0	2370	0	1868	0	2790	0	3201	0
6	1500	0	3037	0	2824	0	2366	0	1830	0	1739	0	1012	0	1436	0	2370	0	2404	0	2712	0	2980	0
7	1648	0	3071	0	2695	0	2313	0	1336	0	1730	0	1466	0	1890	0	2218	0	2859	0	2608	0	2400	0
8	1526	0	2829	0	2681	0	2202	0	1998	0	1726	0	1747	0	1362	0	2197	0	2837	0	2776	0	2742	0
9	735	1	2962	0	2163	0	2054	0	1579	0	1674	0	1159	0	2037	0	2483	0	2600	0	2829	0	1941	0
10	1708	1	1704	0	1436	0	2262	0	1808	0	1254	0	952	0	1981	0	2448	0	2430	0	3209	0	1310	0
11	2552	1	1967	0	2400	0	2301	0	1977	0	1781	0	1172	0	1795	0	2271	0	2141	0	1514	0	1142	0
12	3019	1	2452	0	2942	0	2058	0	1890	0	1691	0	1773	0	1886	0	2374	0	2647	0	2240	0	3011	0
13	2681	1	2686	0	2898	0	2279	0	1591	0	1755	0	1263	0	1899	0	2474	0	2677	0	2742	0	2837	0
14	3201	1	2989	0	2673	0	2275	0	515	0	1419	0	1288	0	2184	0	2353	0	2487	0	2782	0	2569	0
15	2422	1	2893	0	2712	0	2072	0	1959	0	1561	0	1345	0	2141	0	1830	0	2764	0	2574	0	1298	0
16	3114	1	2548	0	2798	0	1830	0	1877	0	1717	0	1457	0	2154	0	2011	0	2742	0	2695	0	1899	0
17	2898	1	2764	0	2660	0	1830	0	1751	0	1553	0	1622	0	2063	0	2210	0	2171	0	2772	0	1154	0
18	2782	1	2841	0	2760	0	2137	0	1825	0	1229	0	1457	0	2111	0	2457	0	2751	0	2738	0	1258	0
19	1293	0	1415	0	2703	0	2141	0	1951	0	1063	0	1925	0	1972	0	2552	0	2768	0	2669	0	2236	0
20	2924	0	1933	0	2703	0	2149	0	1696	0	354	0	1708	0	2050	0	2608	0	2617	0	2867	0	800	0
21	3019	0	1868	0	2638	0	1972	0	1907	0	1258	0	1660	0	2028	0	2309	0	2457	0	1972	0	2054	0
22	2469	0	2794	0	2323	0	2123	0	1635	0	1579	0	1198	0	1959	0	2435	0	2569	0	701	0	1977	0
23	2695	0	2249	0	2032	0	1591	0	1751	0	1492	0	1405	0	1933	0	2392	0	2716	0	861	0	3183	0
24	2604	0	2829	0	2513	0	2175	0	1686	0	1526	0	1856	0	2058	0	2665	0	2811	0	1717	0	2967	0
25	2232	0	2872	0	2357	0	2188	0	1622	0	1068	0	1799	0	515	0	2578	0	2867	0	1726	0	2435	0
26	2236	0	2742	0	2279	0	2063	0	1484	0	1838	0	1963	0	1860	0	2410	0	2487	0	3231	0	2262	0
27	1877	0	2058	0	2548	0	2127	0	1375	0	1856	0	1989	0	2344	0	2469	0	2422	0	3140	0	3473	0
28	2011	0	2893	0	2435	0	2002	0	1245	0	1860	0	1994	0	2327	0	2647	0	2127	0	2885	0	2863	0
29	2499	0	2898	0	2115	0	938	0	1193	0	1371	0	1959	0	2202	0	2612	0	2410	0	1444	0	2885	0
30	2439	0	–	–	2171	0	1193	0	1298	0	1583	0	1951	0	2293	0	2080	0	2915	0	3205	0	2258	0
31	2782	0	–	–	2349	0	–	–	1803	0	–	–	1877	0	2400	0	–	–	2404	0	–	–	2526	0
SUM	**70000**	**1**	**69078**	**0**	**78160**	**0**	**60381**	**0**	**50258**	**0**	**46569**	**0**	**49517**	**0**	**60001**	**0**	**70806**	**0**	**77270**	**0**	**73495**	**0**	**73563**	**0**
MEAN	**2258**	**1**	**2382**	**0**	**2521**	**0**	**2013**	**0**	**1621**	**0**	**1552**	**0**	**1597**	**0**	**1936**	**0**	**2360**	**0**	**2493**	**0**	**2450**	**0**	**2373**	**0**

Name of station	Year of start	Actual situation	History of stop and start
Beira	Setembro-1962	Inoperative	Stopped since Nov-2002
Chimoio	----------	Operative	Has a problem of sending datas to Maputo
Inhambane	Fevereiro-1969	Inoperative	Stopped since Agos-1988 a Dez-1990, de Dez-1999 a Dez-2004 e de Jan-2000 a Fev-2007
Lichinga	Janeiro-1965	Operative	Stopped since Nov-1984 to Maio-1987, from Dez-1998 to Jan-2004 and from Nov-2004 to Abril-2007
Maputo OBS	Janeiro-1970	Operative	Stopped only in Jul-2007
Nampula	Abril-1971	Inoperative	Stopped since Dez-2002 to Dez-2004 and since Out-2005
Pemba	Dezembro-1981	Inoperative	Stopped since Set-2002
Quelimane	----------	Inoperative	Has a problem of sending datas to Maputo
Tete	Agosto-1965	Inoperative	Stopped since Set-1983 a Abril-1985, Ago-1990 to Maio-1993, Jan-2001 to Maio-2006 and since Jul-2006
Xai-Xai	----------	Inoperative	----------

An Example: A list of Mozambique stations which stopped operating and are under the repairmen.

Latest information received at the WRDC.

(Metadata).

Literature:

- *WMO Global Atmosphere Watch (GAW) Strategic Plan: 2008 – 2015*
- *Alexandersson, H. 1986. 'A homogeneity test applied to precipitation data', J. Climate, 6, 661-675*
- *Peterson, T.C., and Easterling, D.R., 1994, 'Creation of homogeneous composite climatological reference series', Int.J.Climatol.,14, 671-679*
- *Peterson, T.C.,at all. 1998, 'Homogeneity adjustments of in situ atmospheric climate data: A review ', Int.J.Climatol.,18, 1493-1517*

Future Tasks:

- Formation of WRDC Metadata Database (MDB);
- Upload of MDB to the WRDC Server;
- Update User Friendly Interface helpful to download the WRDC data.


Greetings from
St. Petersburg
Thank you!