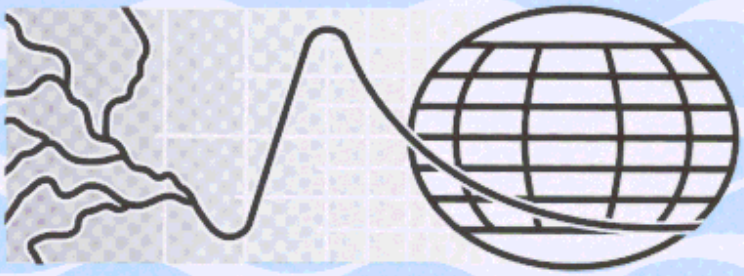
Bundesanstalt für Gewässerkunde
Federal Institute of Hydrology

BfG

Report No. 29

GRDC Status Report 2002



GRDC

GRDC operates with the support of the Federal Republic of Germany under the auspices of the World Meteorological Organization (WMO)

Weltdatenzentrum Abfluss
Bundesanstalt für Gewässerkunde
Koblenz, Deutschland

Global Runoff Data Centre (GRDC)
Federal Institute of Hydrology (BfG)
Koblenz, Germany

Report No. 29

GRDC Status Report 2002

February 2003

P.O.Box 20 02 53
D-56002 Koblenz
Phone: (49 261) 1306-5224; Fax: (49 261) 1306-5280; E-Mail: grdc@bafg.de; http://www.bafg.de/grdc.htm

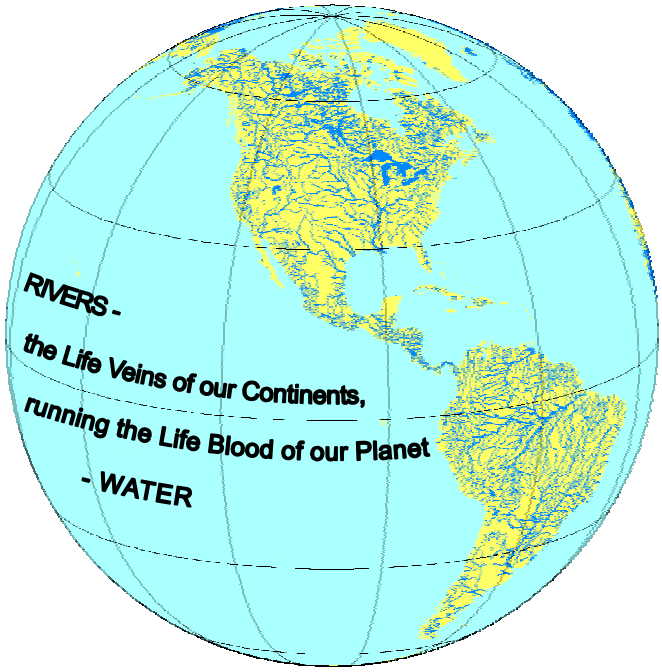
Am Mainzer Tor 1
D-56068 Koblenz

Contents

Annexes

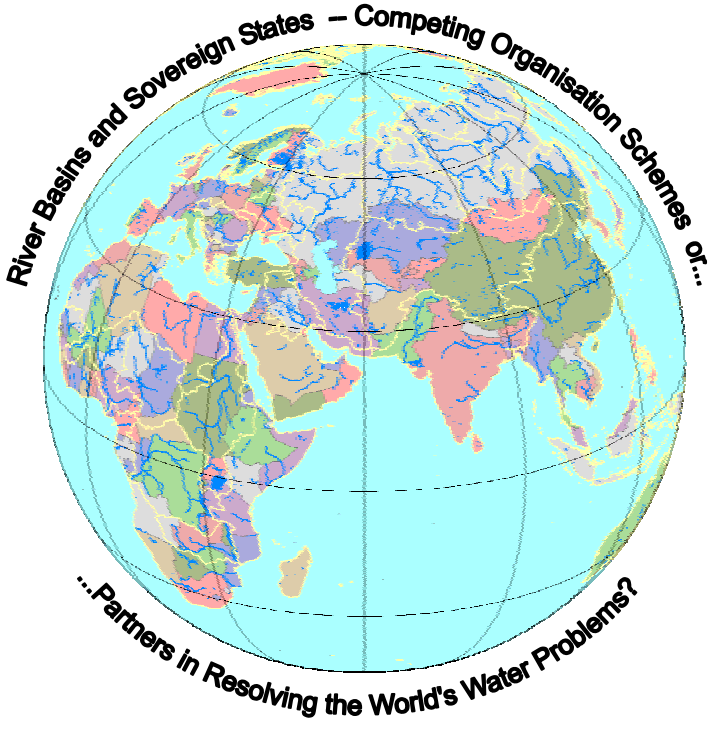
1 Introduction

The GRDC is *the* digital world-wide depository of river discharge data and associated metadata. GRDC's role is to serve as a facilitator for data exchange between data providers and data users.



GRDC serves under the auspices of the World Meteorological Organization (WMO) and has been established at the Federal Institute of Hydrology, Germany, as early as 1988 in order to support the hydrological and climatological research and assessment community by collection and dissemination of a comprehensive and sound runoff data base. Its role has been emphasised in 1995 by the WMO Congress XII, Resolution 21, requesting member countries to provide discharge data to the GRDC. More recently, the WMO Congress XIII stressed again the need for free and unrestricted exchange of hydrological data in its Resolution 25 (1999).

While human society has divided our planet into sovereign states and autonomous regions, there is a natural organisation scheme of the land surface, namely the hierarchically nested structure of river basins. River systems are the life veins of our planet and they are an integral part of the global climate system. As such they feed back to many geophysical processes on local, regional and global scales.



Not all of these feedback loops are yet sufficiently understood. This is why they are in the focus of programmes such as the World Climate Research Programme (WCRP) and numerous activities on integrated water resources assessment and management.

What we do know, however, is that we need to adjust our attitudes and behaviour to finally succeed in a peaceful and sustainable co-existence with one another and with the planet's resources. It is encouraging to see that a widely accepted consensus on this issue is now developing.

The GRDC is dedicated to contribute its share to the solution of these challenges. We believe that the outcome of the endeavours ahead will finally help to tackle the serious water management problems which many parts of the world face and which more will face in the future. Thus we welcome the commitment of the National Hydrological Services (NHS) world-wide to support GRDC by providing us with updates for the Global Runoff Data Base.

With the kind cooperation of a considerable number of the NHSs world-wide the GRDC succeeded again in updating and enlarging its database considerably during the last year. Furthermore, the GRDC team has worked hard on the improvement of its internal work-flow, resulting in extended database structures and reporting capabilities. The present report is intended to give an overview of the status at the end of the year 2002 as well as to highlight the changes during the past year.

Taking the opportunity of presenting our progress to the public, we nevertheless need to stress the fact, that in order to keep the database up to date and further extend it, GRDC entirely relies on close co-operations with the world's national meteorological and hydrological services. Therefore, we would like to draw the readers attention to the maps and tables describing GRDC-stations and their associated time series' lengths and ends. Still, many time series from various parts of the world cease considerably earlier than today. In order to fulfil its mission as illustrated above, the GRDC - in coherence with many international agreements- thus kindly repeats its request for the provision of daily discharge and metadata according to the guidelines summarised in the "Information Note on GRDC Station Selection Criteria, Data Format and Data Transfer" (see annex 9). The cooperation of those who are concerned or who can help is greatly appreciated!

2 Status of GRDC database

2.1 Stations, station-years, and values in GRDC database December 2002

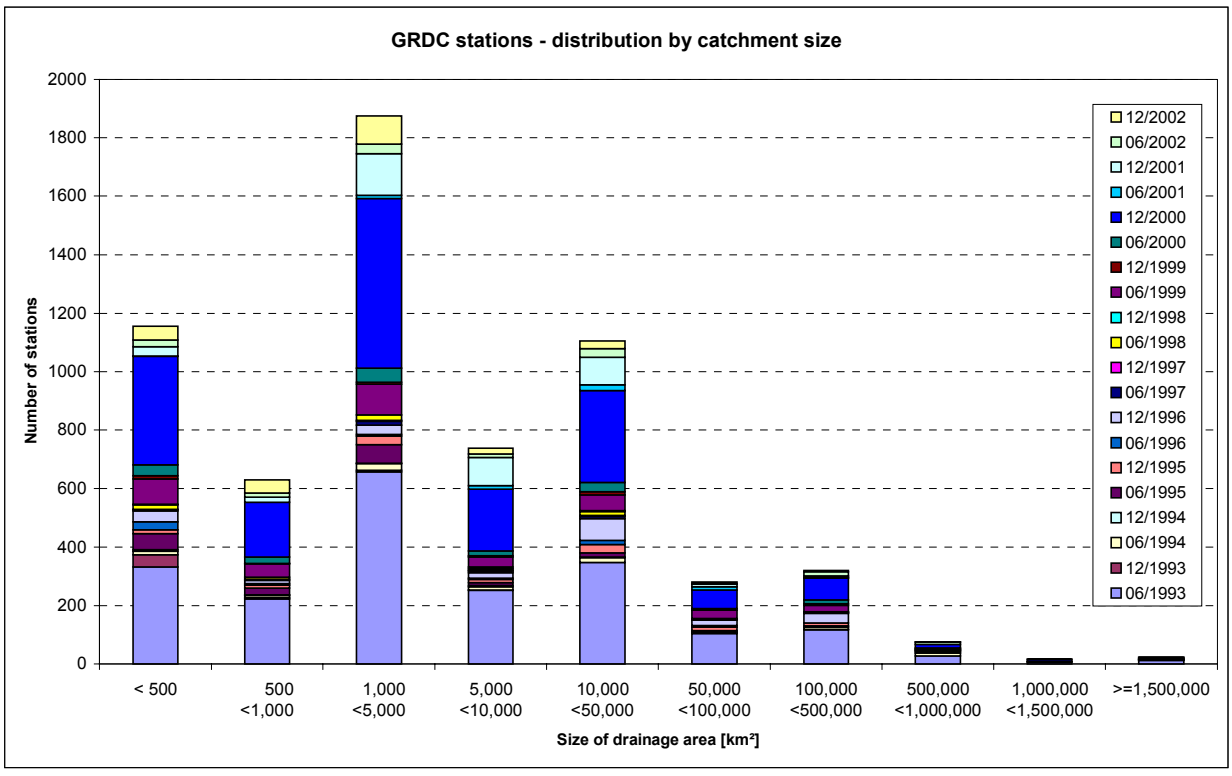
	number of stations	station-years	values
monthly data (total)	6,395	193,944	2,327,328
original monthly data	5,330	139,512	1,674,144
original daily data	3,294	107,244	39,144,060

2.2 Data imported in the reporting period (by countries)

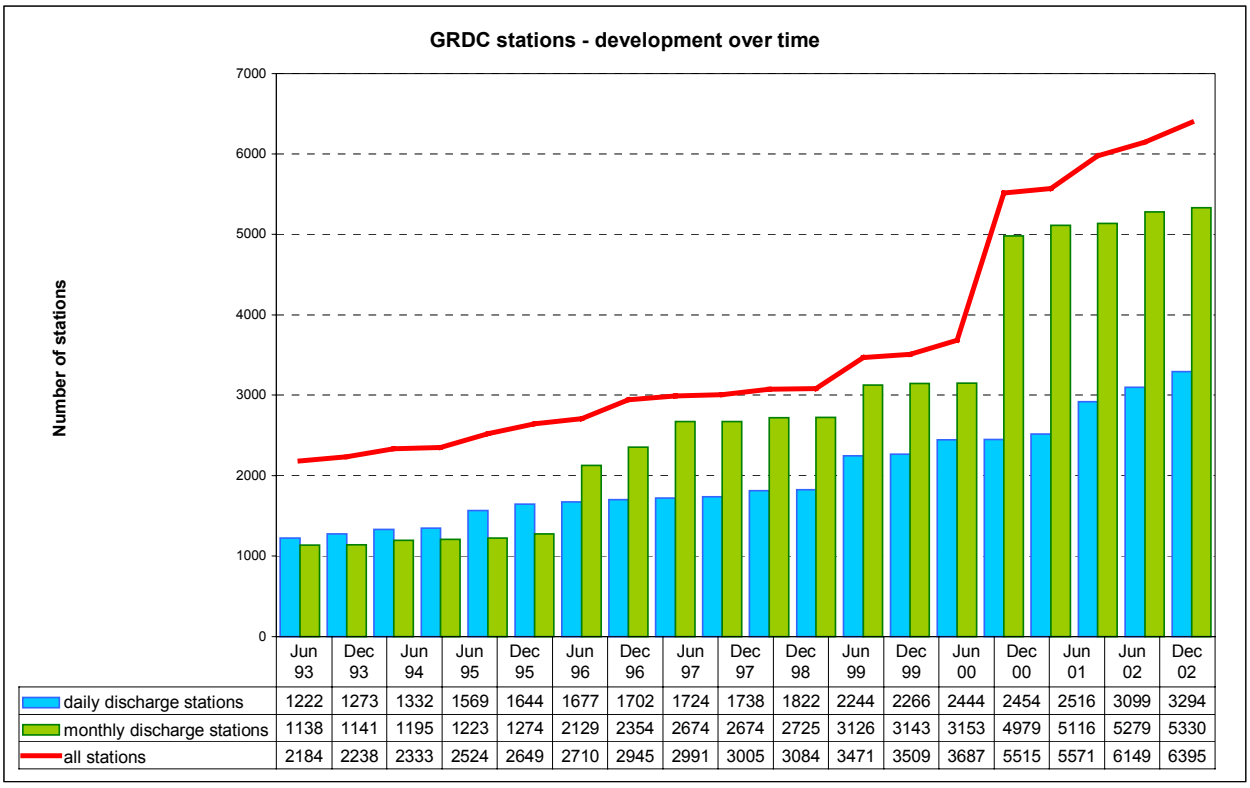
Country	new daily discharge stations	imported daily discharge station years	new monthly discharge stations	imported monthly discharge station years
AU - Australia	26	7946	0	0
BI - Burundi	0	0	51	478
CA - Canada	0	0	13	330
FI - Finland	18	810	0	0
JP - Japan	127	1199	0	0
KH - Cambodia	24	169	0	0
LA - Lao People' Democratic Republic	24	538	0	0
MY - Malaysia	3	394	0	0
RU - Russian Federation	0	314	0	0
SI - Slovenia	0	10	0	10
TH - Thailand	62	1405	0	0
US - USA	26	1215	0	0
VN - Viet Nam	9	91	0	0
ZA - South Africa	1	1935	3	2014
	320	16026	67	2832

(for an extensive list by stations see annex 4)

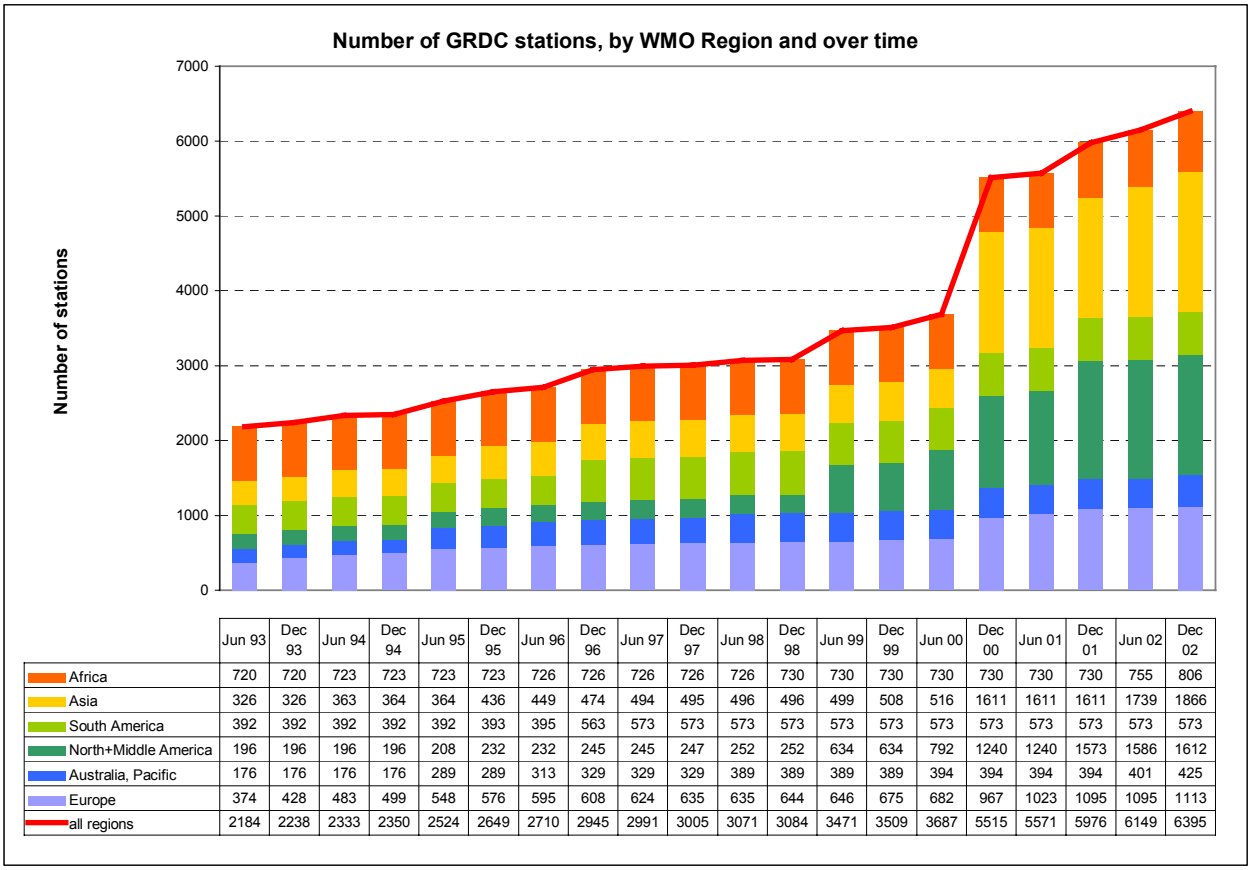
2.3 GRDC stations - distribution by catchment size



2.4 GRDC stations - development over time

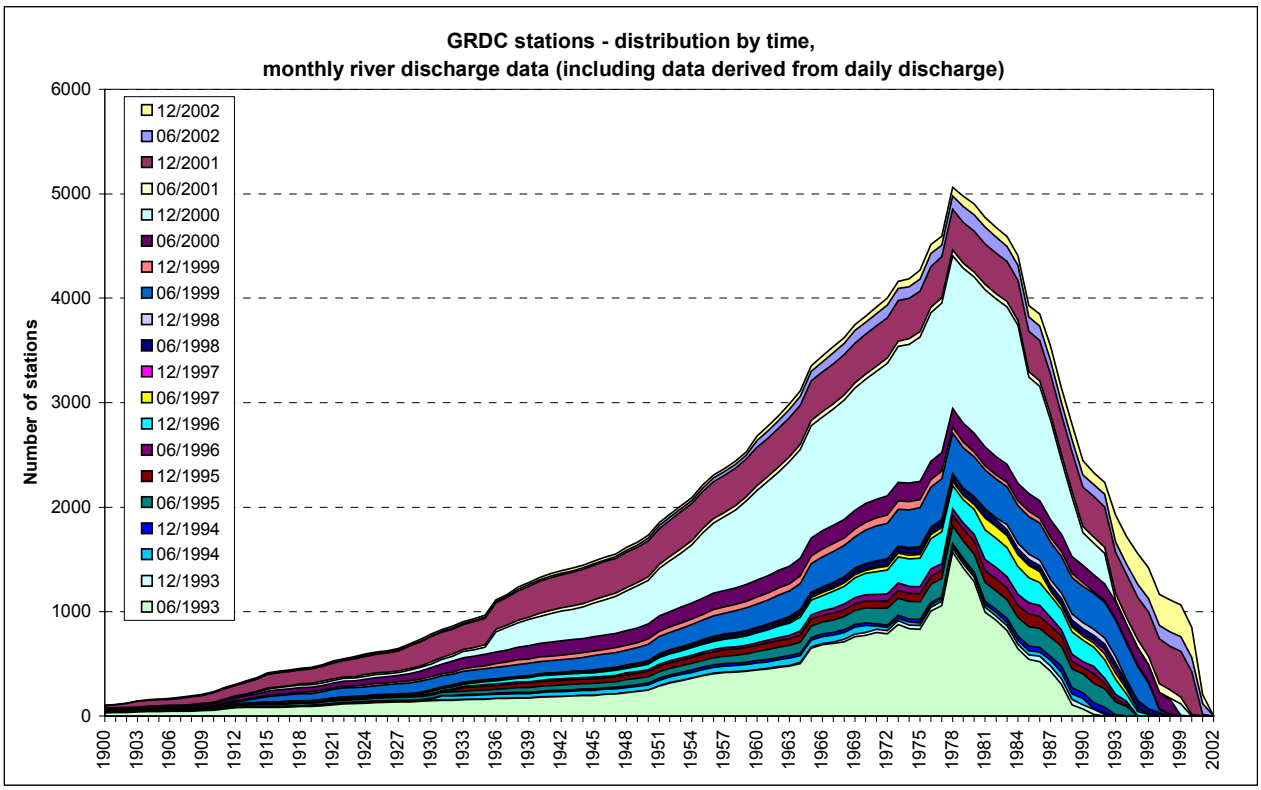


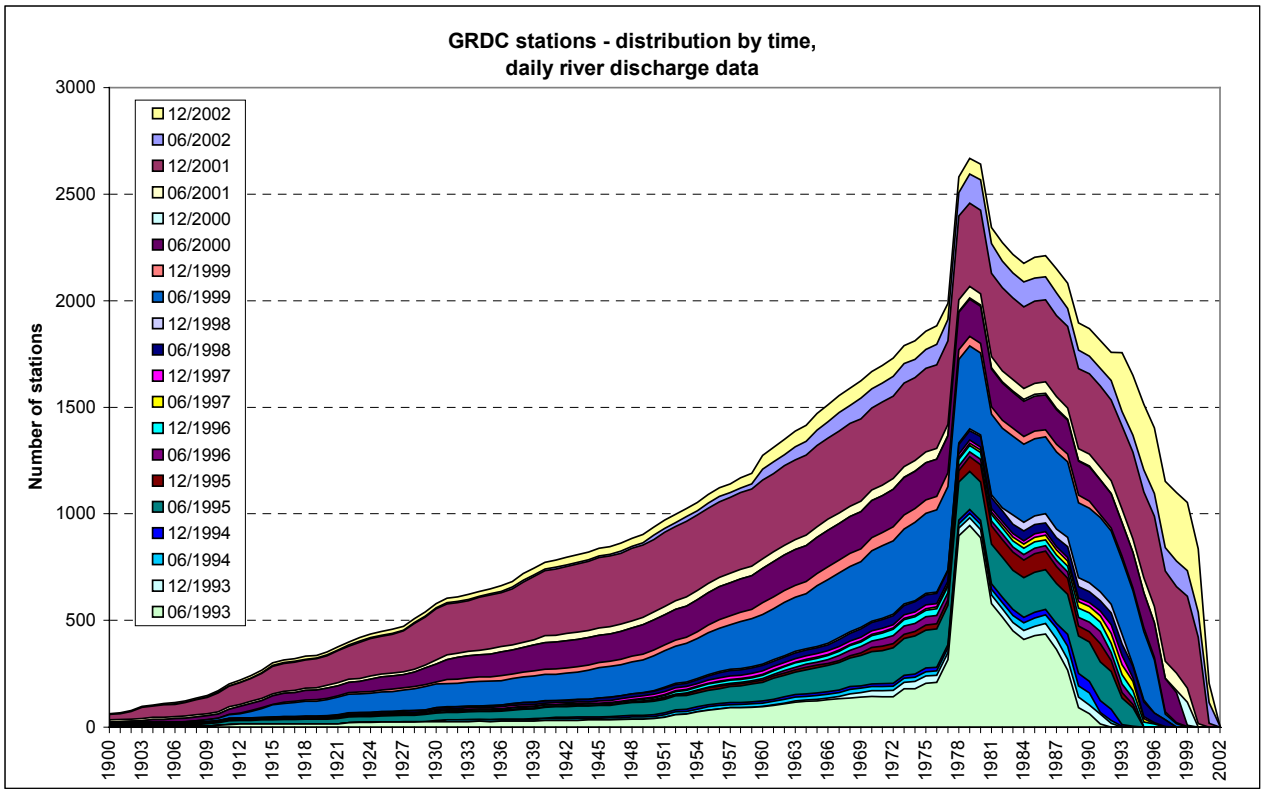
	Jun 93	Dec 93	Jun 94	Jun 95	Dec 95	Jun 96	Dec 96	Jun 97	Dec 97	Dec 98	Jun 99	Dec 99	Jun 00	Dec 00	Jun 01	Jun 02	Dec 02
daily discharge stations	1222	1273	1332	1569	1644	1677	1702	1724	1738	1822	2244	2266	2444	2454	2516	3099	3294
monthly discharge stations	1138	1141	1195	1223	1274	2129	2354	2674	2674	2725	3126	3143	3153	4979	5116	5279	5330
all stations	2184	2238	2333	2524	2649	2710	2945	2991	3005	3084	3471	3509	3687	5515	5571	6149	6395



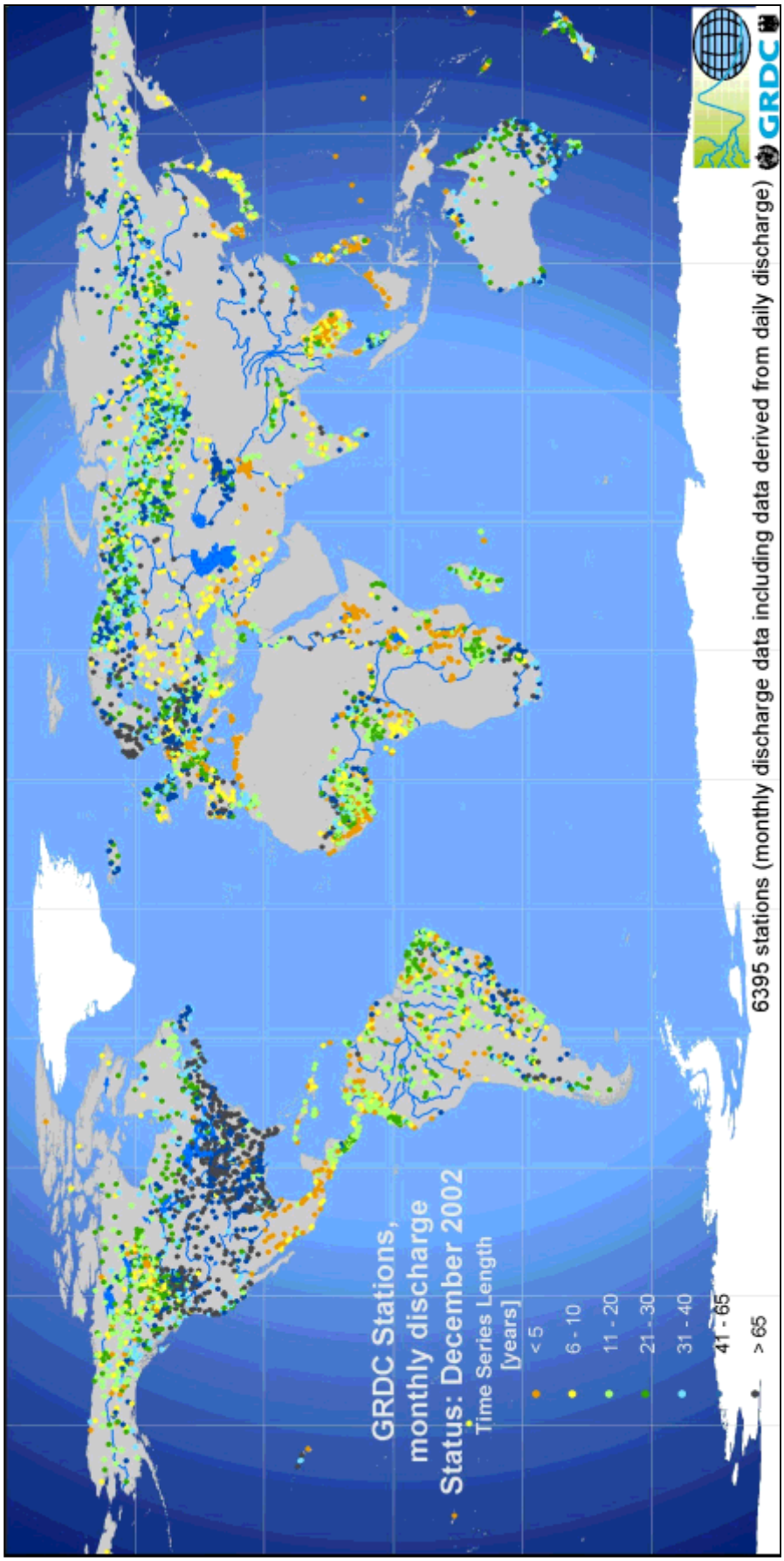
	Jun 93	Dec 93	Jun 94	Dec 94	Jun 95	Dec 95	Jun 96	Dec 96	Jun 97	Dec 97	Jun 98	Dec 98	Jun 99	Dec 99	Jun 00	Dec 00	Jun 01	Dec 01	Jun 02	Dec 02
Africa	720	720	723	723	723	723	726	726	726	726	726	730	730	730	730	730	730	730	755	806
Asia	326	326	363	364	364	436	449	474	494	495	496	496	499	508	516	1611	1611	1611	1739	1866
South America	392	392	392	392	392	393	395	563	573	573	573	573	573	573	573	573	573	573	573	573
North+Middle America	196	196	196	196	208	232	232	245	245	247	252	252	634	634	792	1240	1240	1573	1586	1612
Australia, Pacific	176	176	176	176	289	289	313	329	329	329	389	389	389	389	394	394	394	394	401	425
Europe	374	428	483	499	548	576	595	608	624	635	635	644	646	675	682	967	1023	1095	1095	1113
all regions	2184	2238	2333	2350	2524	2649	2710	2945	2991	3005	3071	3084	3471	3509	3687	5515	5571	5976	6149	6395

2.5 GRDC stations - distribution by time

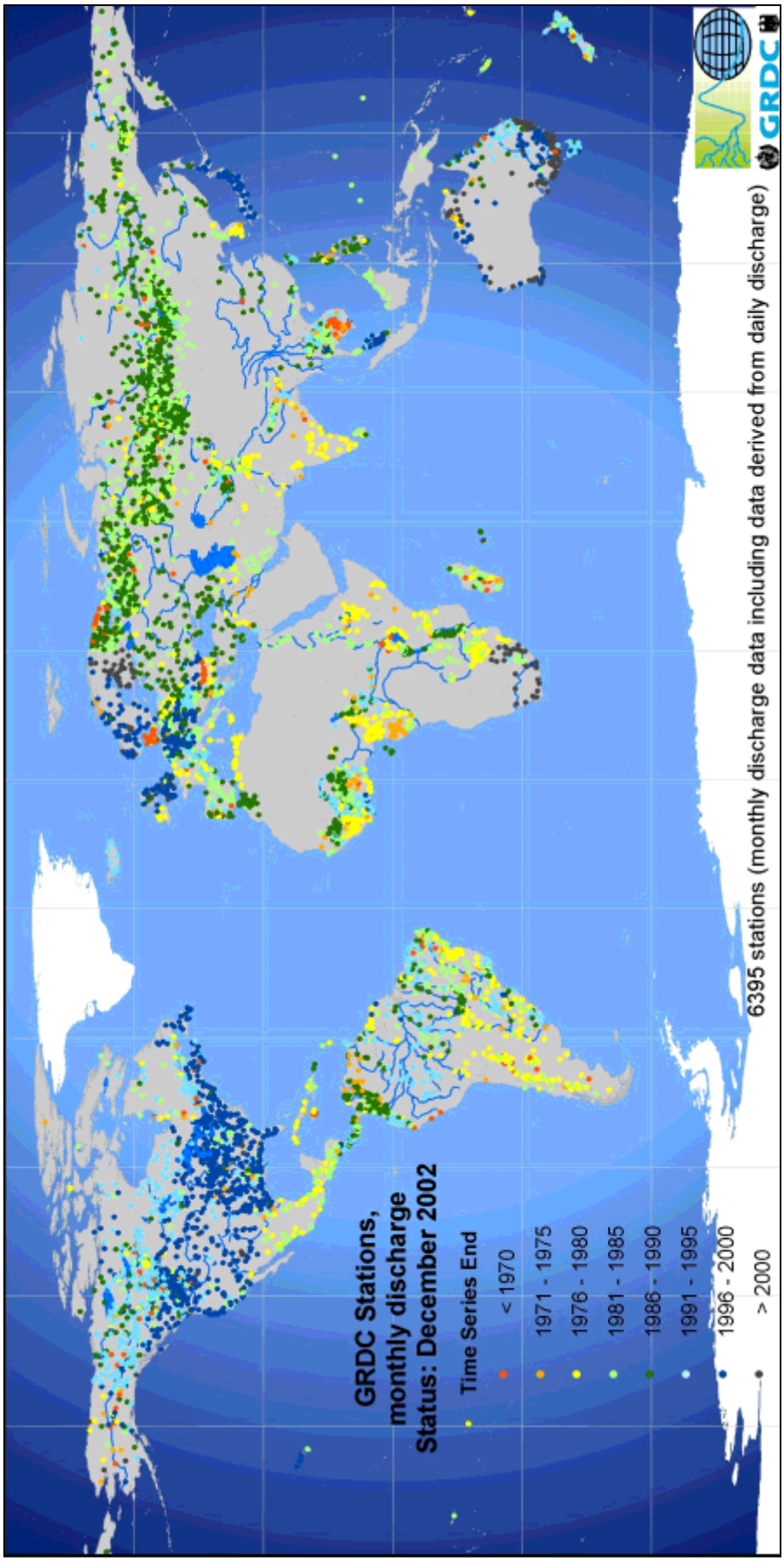




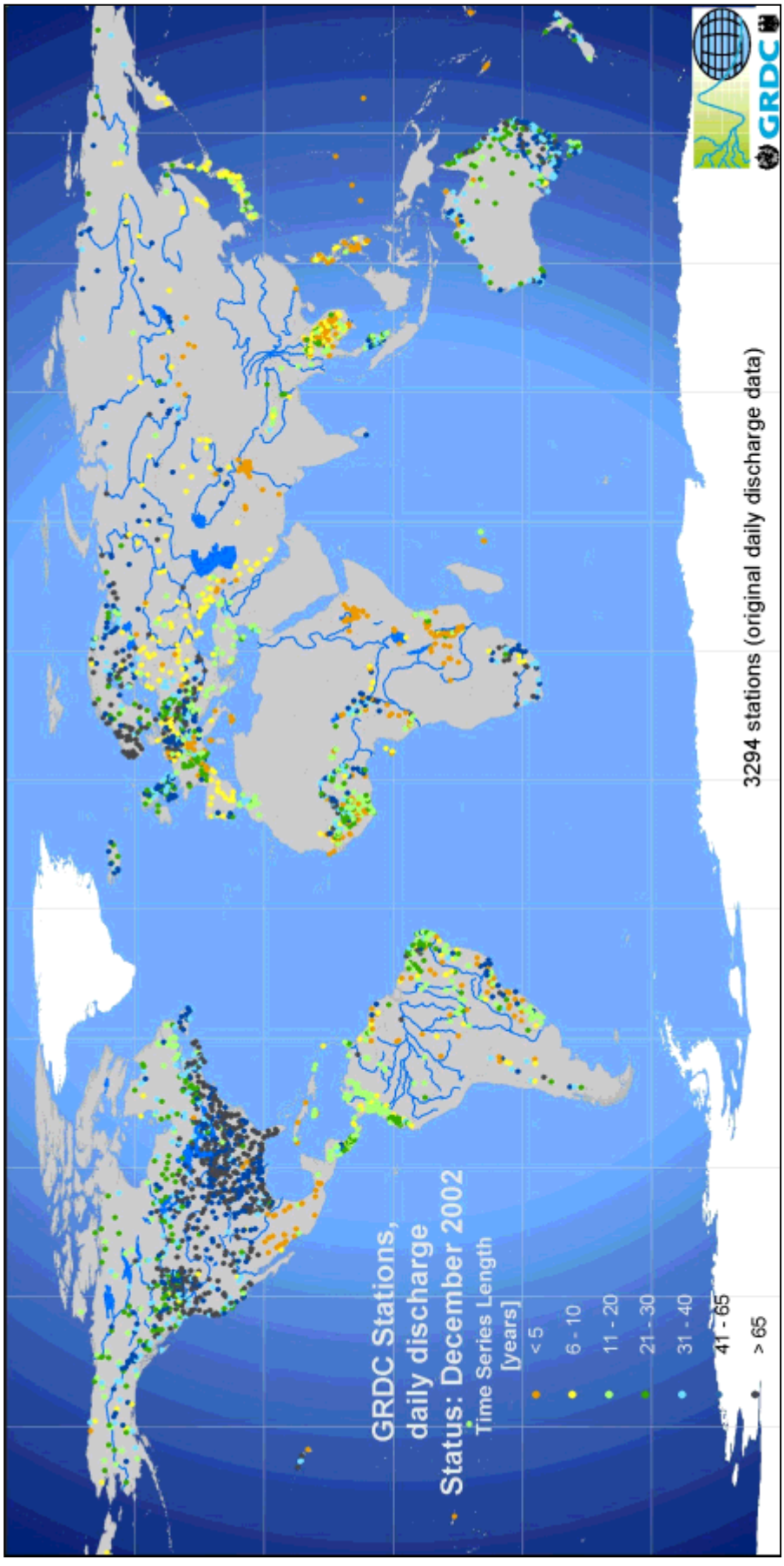
2.6 Overview of the GRDC stations categorised by time series length (monthly discharge)



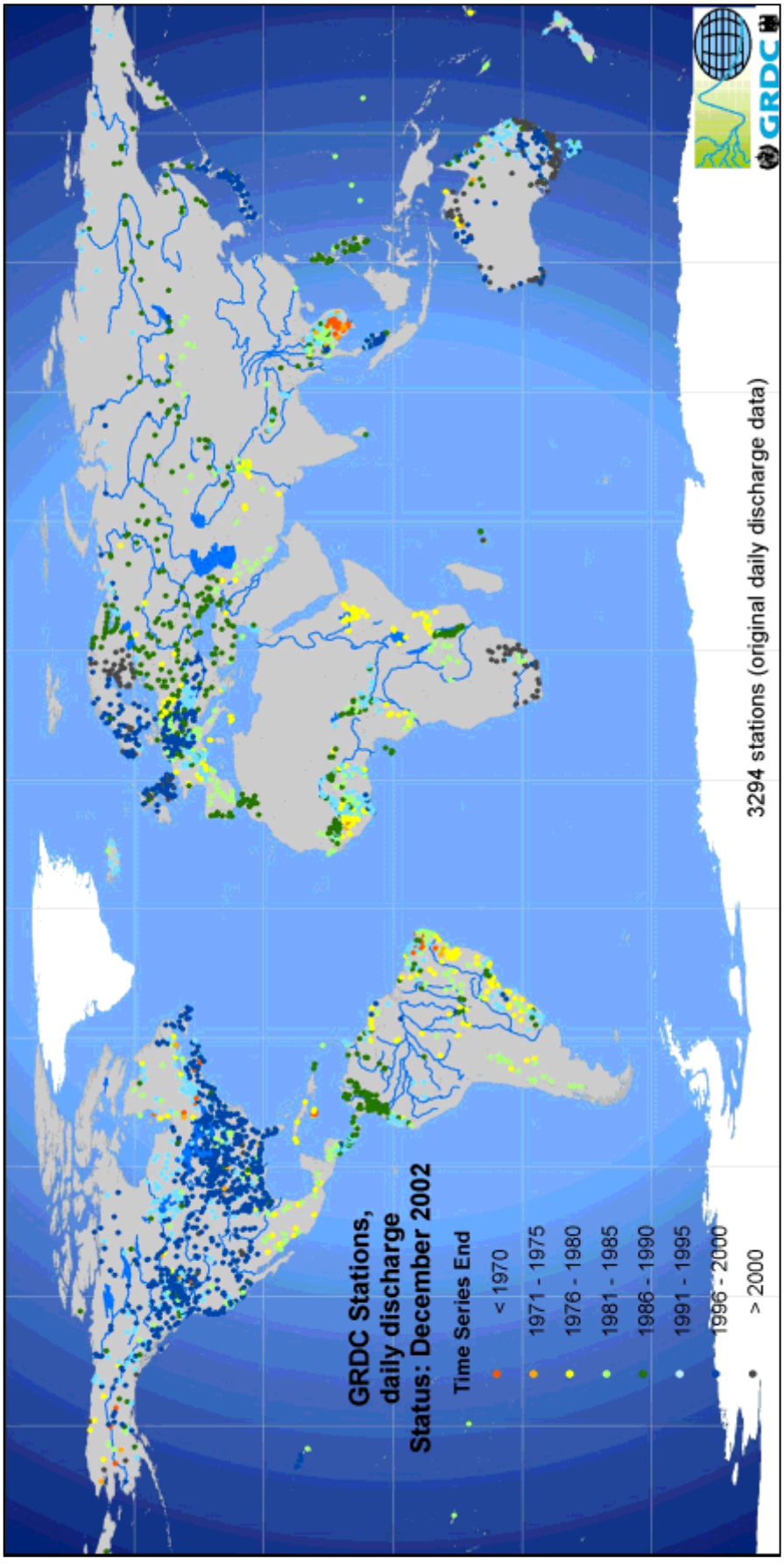
2.7 Overview of the GRDC stations categorised by the last year of the time series (monthly discharge)



2.8 Overview of the GRDC stations categorised by time series length (daily discharge)



2.9 Overview of the GRDC stations categorised by the last year of the time series (daily discharge)



2.10 Metadata of GRDC stations by WMO region and country (Africa)

Status: December 2002

Country	GRDC stations (total)			Daily data stations (DD)					Monthly data stations (MD)				
	Number of stations	Earliest record	Latest record	DD stations	% DD stations	DD station years	DD av. length	DD max. length	MD stations	% MD stations	MD station years	MD av. length	MD max. length
WMO 1-6	**6395**	**1807**	**2002**	**3294**	**52**	**107244**	**33**	**187**	**5330**	**83**	**139512**	**26**	**186**
WMO 1 - Africa	806	1869	2001	395	49	6790	9	93	806	100	14480	17	115
DZ - ALGERIA	12	1976	1978	0	0	0	0	0	12	100	31	3	3
BJ - BENIN	22	1944	1992	22	100	731	33	49	22	100	698	32	48
BF - BURKINA FASO	45	1951	1990	11	24	50	5	7	45	100	836	19	40
BI - BURUNDI	51	1970	1991	0	0	0	0	0	51	100	579	11	21
CM - CAMEROON	43	1930	1979	0	0	0	0	0	43	100	943	22	50
CF - CENTRAL AFRICAN REP.	24	1911	1994	21	88	154	7	10	24	100	497	21	65
TD - CHAD	15	1933	1991	13	87	86	7	16	15	100	401	27	59
CG - CONGO	20	1947	1982	11	55	33	3	3	20	100	194	10	36
CD - CONGO, DEM. REP. (ZAIRE)	1	1903	1983	1	100	81	81	81	1	100	80	80	80
CI - COTE D'IVOIRE	55	1955	1996	55	100	867	16	39	55	100	339	6	26
EG - EGYPT	6	1869	1983	0	0	0	0	0	6	100	170	28	115
ET - ETHIOPIA	30	1969	1980	21	70	63	3	3	30	100	76	3	6
GA - GABON	19	1930	1974	0	0	0	0	0	19	100	202	11	45
GH - GHANA	16	1936	1978	0	0	0	0	0	16	100	252	16	43
GN - GUINEA	20	1923	1980	18	90	373	21	57	20	100	363	18	56
KE - KENYA	5	1934	1980	4	80	12	3	3	5	100	49	10	41
LS - LESOTHO	7	1964	1984	3	43	20	7	7	7	100	83	12	20
LR - LIBERIA	7	1973	1978	0	0	0	0	0	7	100	20	3	6
MG - MADAGASCAR	35	1948	1987	0	0	0	0	0	35	100	725	21	34
MW - MALAWI	31	1953	1986	29	94	77	3	9	31	100	123	4	28
ML - MALI	43	1905	1994	42	98	1126	27	86	43	100	1492	35	85
MR - MAURITANIA	3	1978	1985	3	100	16	5	8	3	100	11	4	6
MU - MAURITIUS	6	1976	1988	6	100	31	5	11	6	100	49	8	9
MA - MOROCCO	25	1951	1990	18	72	331	18	39	25	100	499	20	38
MZ - MOZAMBIQUE	8	1976	1978	0	0	0	0	0	8	100	21	3	3
NE - NIGER	17	1929	1991	16	94	349	22	52	17	100	415	24	63
NG - NIGERIA	4	1960	1988	0	0	0	0	0	4	100	32	8	29
RE - REUNION	1	1978	1980	1	100	3	3	3	1	100	2	2	2
RW - RWANDA	3	1965	1983	0	0	0	0	0	3	100	57	19	19
ST - SAO TOME AND PRINCIPE	10	1980	1989	4	40	8	2	2	10	100	81	8	9
SN - SENEGAL	31	1903	1995	25	81	208	8	13	31	100	640	21	81
SL - SIERRA LEONE	7	1976	1978	0	0	0	0	0	7	100	16	2	3
SO - SOMALIA	6	1951	1978	0	0	0	0	0	6	100	165	28	28
ZA - SOUTH AFRICA	40	1906	2001	39	98	1891	48	93	40	100	2076	52	95
SD - SUDAN	18	1912	1983	0	0	0	0	0	18	100	712	40	72
SZ - SWAZILAND	3	1955	1990	3	100	71	24	33	3	100	68	23	32
TZ - TANZANIA, UNITED REP. OF	26	1940	1987	17	65	159	9	26	26	100	260	10	31
TG - TOGO	6	1953	1982	2	33	10	5	5	6	100	65	11	21
TN - TUNISIA	6	1976	1978	0	0	0	0	0	6	100	17	3	3
UG - UGANDA	12	1946	1981	0	0	0	0	0	12	100	127	11	24
ZM - ZAMBIA	16	1976	1984	10	63	40	4	4	16	100	55	3	5
ZW - ZIMBABWE	51	1949	1983	0	0	0	0	0	51	100	959	19	31
WMO 2 - Asia	2254	1859	2000	603	27	6848	9	116	1973	88	53243	18	127
WMO 3 - South America	573	1901	1996	280	49	2685	10	67	568	99	11401	14	86
WMO 4 - North + Middle America	1620	1860	2001	1086	67	57052	14	137	1053	65	31465	13	136
WMO 5 - Australia + Pacific	419	1886	2002	357	85	12512	11	115	368	88	9542	9	95
WMO 6 - Europe	723	1807	2001	573	79	21357	21	187	562	78	19381	29	186

2.11 Metadata of GRDC stations by WMO region and country (Asia)

Status: December 2002

Country	GRDC stations (total)			Daily data stations (DD)					Monthly data stations (MD)				
	Number of stations	Earliest record	Latest record	DD stations	% DD stations	DD station years	DD av. length	DD max. length	MD stations	% MD stations	MD station years	MD av. length	MD max. length
WMO 1-6	**6395**	**1807**	**2002**	**3294**	**52**	**107244**	**33**	**187**	**5330**	**83**	**139512**	**26**	**186**
WMO 1 - Africa	806	1869	2001	395	49	6790	9	93	806	100	14480	17	115
WMO 2 - Asia	2254	1859	2000	603	27	6848	9	116	1973	88	53243	18	127
AF - AFGHANISTAN	2	1975	1978	2	100	8	4	4	2	100	6	3	3
BD - BANGLADESH	4	1969	1992	3	75	24	8	8	4	100	27	7	7
KH - CAMBODIA	18	1960	1994	18	100	169	9	35	0	0	0	0	0
CN - CHINA	21	1865	1989	1	5	27	27	27	20	95	1128	56	123
HK - HONG KONG	2	1977	1983	2	100	12	6	7	2	100	10	5	6
IN - INDIA	44	1901	1978	0	0	0	0	0	44	100	719	16	78
IR - IRAN, ISLAMIC REPUBLIC OF	24	1965	1983	11	46	72	7	7	24	100	183	8	19
IQ - IRAQ	4	1964	1971	0	0	0	0	0	4	100	32	8	8
IL - ISRAEL	7	1960	1993	6	86	107	18	33	7	100	54	8	15
JP - JAPAN	152	1938	2000	152	100	1432	9	23	25	16	203	8	47
JO - JORDAN	3	1965	1988	1	33	11	11	11	2	67	20	10	10
KZ - KAZAKSTAN	112	1915	1987	10	9	20	2	3	112	100	2861	26	69
KP - KOREA, DEM. PEOPLE'S REP.	7	1976	1983	0	0	0	0	0	7	100	46	7	8
KR - KOREA, REPUBLIC OF	8	1947	1978	0	0	0	0	0	8	100	69	9	32
KG - KYRGYZSTAN	27	1910	1995	6	22	26	4	11	27	100	1187	44	66
LA - LAOS	40	1960	1994	40	100	548	14	35	7	18	113	16	34
MN - MONGOLIA	13	1976	1984	7	54	34	5	5	13	100	79	6	9
MM - MYANMAR	4	1978	1988	4	100	44	11	11	4	100	40	10	10
NP - NEPAL	30	1962	1993	10	33	100	10	15	30	100	560	19	32
PK - PAKISTAN	27	1973	1982	24	89	76	3	5	27	100	71	3	6
RU - RUSSIAN FEDERATION	1483	1859	1999	168	11	2414	14	116	1479	100	42468	29	127
LK - SRI LANKA	7	1927	1989	1	14	63	63	63	7	100	158	23	60
SY - SYRIAN ARAB REPUBLIC	4	1976	1978	0	0	0	0	0	4	100	12	3	3
TW - TAIWAN, PROVINCE OF CHINA	39	1953	1993	0	0	0	0	0	39	100	1121	29	41
TJ - TAJIKISTAN	24	1930	1995	4	17	12	3	3	24	100	1009	42	64
TH - THAILAND	126	1924	2000	122	97	1544	13	51	38	30	398	10	50
TM - TURKMENISTAN	1	1932	1989	0	0	0	0	0	1	100	58	58	58
UZ - UZBEKISTAN	11	1931	1995	1	9	3	3	3	11	100	603	55	64
VN - VIET NAM	10	1960	1994	10	100	102	10	27	1	10	8	8	8
WMO 3 - South America	573	1901	1996	280	49	2685	10	67	568	99	11401	14	86
WMO 4 - North + Middle America	1620	1860	2001	1086	67	57052	14	137	1053	65	31465	13	136
WMO 5 - Australia + Pacific	419	1886	2002	357	85	12512	11	115	368	88	9542	9	95
WMO 6 - Europe	723	1807	2001	573	79	21357	21	187	562	78	19381	29	186

2.12 Metadata of GRDC stations by WMO region and country (South America)

Status: December 2002

Country	GRDC stations (total)			Daily data stations (DD)					Monthly data stations (MD)				
	Number of stations	Earliest record	Latest record	DD stations	% DD stations	DD station years	DD av. length	DD max. length	MD stations	% MD stations	MD station years	MD av. length	MD max. length
WMO 1-6	**6395**	**1807**	**2002**	**3294**	**52**	**107244**	**33**	**187**	**5330**	**83**	**139512**	**26**	**186**
WMO 1 - Africa	806	1869	2001	395	49	6790	9	93	806	100	14480	17	115
WMO 2 - Asia	2254	1859	2000	603	27	6848	9	116	1973	88	53243	18	127
WMO 3 - South America	573	1901	1996	280	49	2685	10	67	568	99	11401	14	86
AR - ARGENTINA	88	1901	1986	18	20	100	6	7	88	100	2856	32	86
BO - BOLIVIA	6	1976	1978	0	0	0	0	0	6	100	18	3	3
BR - BRAZIL	323	1910	1996	150	46	978	7	52	323	100	6781	21	82
CL - CHILE	6	1966	1983	0	0	0	0	0	6	100	91	15	18
CO - COLOMBIA	62	1969	1988	46	74	497	11	11	62	100	549	9	15
EC - ECUADOR	18	1964	1994	18	100	331	18	26	18	100	408	23	31
GF - FRENCH GUIANA	4	1951	1995	4	100	97	24	45	4	100	59	15	45
GY - GUYANA	7	1965	1995	7	100	110	16	22	7	100	78	11	26
PY - PARAGUAY	1	1965	1971	0	0	0	0	0	1	100	7	7	7
PE - PERU	6	1911	1985	1	17	9	9	9	6	100	77	13	57
SR - SURINAME	7	1973	1980	4	57	12	3	3	7	100	28	4	7
UY - URUGUAY	17	1910	1994	16	94	319	20	51	12	71	209	17	69
VE - VENEZUELA	28	1923	1989	16	57	232	15	67	28	100	240	9	66
WMO 4 - North + Middle America	1620	1860	2001	1086	67	57052	14	137	1053	65	31465	13	136
WMO 5 - Australia + Pacific	419	1886	2002	357	85	12512	11	115	368	88	9542	9	95
WMO 6 - Europe	723	1807	2001	573	79	21357	21	187	562	78	19381	29	186

2.13 Metadata of GRDC stations by WMO region and country (North and Middle America)

Status: December 2002

Country	GRDC stations (total)			Daily data stations (DD)					Monthly data stations (MD)				
	Number of stations	Earliest record	Latest record	DD stations	% DD stations	DD station years	DD av. length	DD max. length	MD stations	% MD stations	MD station years	MD av. length	MD max. length
WMO 1-6	**6395**	**1807**	**2002**	**3294**	**52**	**107244**	**33**	**187**	**5330**	**83**	**139512**	**26**	**186**
WMO 1 - Africa	806	1869	2001	395	49	6790	9	93	806	100	14480	17	115
WMO 2 - Asia	2254	1859	2000	603	27	6848	9	116	1973	88	53243	18	127
WMO 3 - South America	573	1901	1996	280	49	2685	10	67	568	99	11401	14	86
WMO 4 - North + Middle America	1620	1860	2001	1086	67	57052	14	137	1053	65	31465	13	136
CA - CANADA	846	1860	1996	402	48	17624	44	137	843	100	24876	30	136
CR - COSTA RICA	46	1921	1992	44	96	716	16	20	7	15	138	20	64
CU - CUBA	10	1965	1980	4	40	12	3	3	7	70	83	12	15
DO - DOMINICAN REPUBLIC	5	1976	1983	0	0	0	0	0	5	100	35	7	8
SV - EL SALVADOR	5	1969	1980	0	0	0	0	0	5	100	36	7	10
GP - GUADELOUPE	1	1973	1983	1	100	6	6	6	1	100	3	3	3
GT - GUATEMALA	7	1976	1983	0	0	0	0	0	7	100	24	3	8
HN - HONDURAS	5	1966	1981	5	100	64	13	16	0	0	0	0	0
JM - JAMAICA	8	1954	1979	8	100	95	12	17	3	38	33	11	11
MQ - MARTINIQUE	1	1973	1975	0	0	0	0	0	1	100	3	3	3
MX - MEXICO	60	1965	1983	33	55	156	5	19	32	53	162	5	18
NI - NICARAGUA	16	1952	1996	15	94	352	23	43	16	100	337	21	43
PA - PANAMA	12	1965	1988	6	50	60	10	11	8	67	129	16	20
PR - PUERTO RICO	2	1978	1980	2	100	6	3	3	0	0	0	0	0
TT - TRINIDAD AND TOBAGO	5	1967	1994	5	100	99	20	28	5	100	94	19	27
US - UNITED STATES	591	1860	2001	561	95	37862	67	122	113	19	5512	49	112
WMO 5 - Australia + Pacific	419	1886	2002	357	85	12512	11	115	368	88	9542	9	95
WMO 6 - Europe	723	1807	2001	573	79	21357	21	187	562	78	19381	29	186

2.14 Metadata of GRDC stations by WMO region and country (Australia and Pacific)

Status: December 2002

Country	GRDC stations (total)			Daily data stations (DD)					Monthly data stations (MD)				
	Number of stations	Earliest record	Latest record	DD stations	% DD stations	DD station years	DD av. length	DD max. length	MD stations	% MD stations	MD station years	MD av. length	MD max. length
WMO 1-6	**6395**	**1807**	**2002**	**3294**	**52**	**107244**	**33**	**187**	**5330**	**83**	**139512**	**26**	**186**
WMO 1 - Africa	806	1869	2001	395	49	6790	9	93	806	100	14480	17	115
WMO 2 - Asia	2254	1859	2000	603	27	6848	9	116	1973	88	53243	18	127
WMO 3 - South America	573	1901	1996	280	49	2685	10	67	568	99	11401	14	86
WMO 4 - North + Middle America	1620	1860	2001	1086	67	57052	14	137	1053	65	31465	13	136
WMO 5 - Australia + Pacific	419	1886	2002	357	85	12512	11	115	368	88	9542	9	95
AS - AMERICAN SAMOA	1	1982	1983	1	100	2	2	2	0	0	0	0	0
AU - AUSTRALIA	277	1886	2002	273	99	11202	41	115	230	83	7972	35	95
FJ - FIJI	2	1978	1980	2	100	6	3	3	2	100	4	2	2
PF - FRENCH POLYNESIA	3	1973	1986	2	67	24	12	13	3	100	28	9	12
GU - GUAM	1	1982	1983	1	100	2	2	2	1	100	1	1	1
MY - MALAYSIA	41	1949	2000	27	66	734	27	41	38	93	299	8	37
FM - MICRONESIA, FED. STATES OF	2	1982	1983	2	100	4	2	2	2	100	2	1	1
NC - NEW CALEDONIA	5	1955	1983	2	40	10	5	5	5	100	69	14	29
NZ - NEW ZEALAND	35	1935	1994	11	31	320	29	44	35	100	812	23	43
PW - PALAU	1	1982	1983	1	100	2	2	2	1	100	1	1	1
PG - PAPUA NEW GUINEA	3	1976	1983	0	0	0	0	0	3	100	15	5	8
PH - PHILIPPINES	47	1946	1988	34	72	195	6	11	47	100	328	7	33
SG - SINGAPORE	1	1969	1988	1	100	11	11	11	1	100	11	11	11
WMO 6 - Europe	723	1807	2001	573	79	21357	21	187	562	78	19381	29	186

2.15 Metadata of GRDC stations by WMO region and country (Europe)

Status: December 2002

Country	GRDC stations (total)			Daily data stations (DD)					Monthly data stations (MD)				
	Number of stations	Earliest record	Latest record	DD stations	% DD stations	DD station years	DD av. length	DD max. length	MD stations	% MD stations	MD station years	MD av. length	MD max. length
WMO 1-6	**6395**	**1807**	**2002**	**3294**	**52**	**107244**	**33**	**187**	**5330**	**83**	**139512**	**26**	**186**
WMO 1 - Africa	806	1869	2001	395	49	6790	9	93	806	100	14480	17	115
WMO 2 - Asia	2254	1859	2000	603	27	6848	9	116	1973	88	53243	18	127
WMO 3 - South America	573	1901	1996	280	49	2685	10	67	568	99	11401	14	86
WMO 4 - North + Middle America	1620	1860	2001	1086	67	57052	14	137	1053	65	31465	13	136
WMO 5 - Australia + Pacific	419	1886	2002	357	85	12512	11	115	368	88	9542	9	95
WMO 6 - Europe	723	1807	2001	573	79	21357	21	187	562	78	19381	29	186
AL - ALBANIA	9	1965	1983	0	0	0	0	0	9	100	76	8	19
AM - ARMENIA	2	1978	1981	2	100	6	3	3	2	100	8	4	4
AT - AUSTRIA	18	1930	1997	17	94	661	39	60	10	56	276	28	46
AZ - AZERBAIJAN	4	1930	1986	2	50	6	3	3	4	100	83	21	54
BY - BELARUS	5	1965	1986	4	80	12	3	3	5	100	48	10	19
BE - BELGIUM	3	1967	1983	2	67	9	5	6	3	100	20	7	13
BG - BULGARIA	15	1931	1986	3	20	27	9	9	15	100	317	21	40
CY - CYPRUS	14	1965	1993	2	14	21	11	17	14	100	296	21	23
CZ - CZECH REPUBLIC	13	1851	2000	10	77	614	61	104	13	100	655	50	150
DK - DENMARK	17	1917	1979	0	0	0	0	0	17	100	638	38	63
EE - ESTONIA	4	1955	1991	4	100	46	12	37	4	100	74	19	36
FI - FINLAND	36	1847	2001	36	100	2048	57	155	18	50	1220	68	145
FR - FRANCE	57	1863	1992	51	89	974	19	32	56	98	1393	25	117
DE - GERMANY	94	1814	2000	92	98	5723	62	187	38	40	2280	60	184
GE - GEORGIA	8	1965	1986	7	88	21	3	3	8	100	82	10	19
GR - GREECE	11	1962	1995	2	18	6	3	3	11	100	161	15	27
HU - HUNGARY	19	1891	1995	18	95	664	37	66	19	100	597	31	95
IS - ICELAND	12	1932	1993	10	83	392	39	61	12	100	492	41	60
IE - IRELAND	7	1973	1978	0	0	0	0	0	7	100	40	6	6
IT - ITALY	12	1918	1990	11	92	87	8	27	12	100	306	25	62
LV - LATVIA	3	1965	1986	2	67	6	3	3	3	100	37	12	19
LT - LITHUANIA	5	1812	1993	4	80	12	3	3	5	100	214	43	182
LU - LUXEMBOURG	2	1978	1987	2	100	15	8	10	2	100	13	7	9
MK - MACEDONIA	1	1978	1989	1	100	11	11	11	1	100	12	12	12
MD - MOLDOVA, REPUBLIC OF	2	1965	1986	1	50	2	2	2	2	100	28	14	19
NL - NETHERLANDS	10	1901	2000	10	100	224	22	100	5	50	251	50	89
NO - NORWAY	38	1871	2001	36	95	3018	84	131	14	37	979	70	108
PL - POLAND	32	1900	1997	23	72	373	16	29	22	69	1135	52	95
PT - PORTUGAL	16	1913	1991	10	63	274	27	51	16	100	182	11	55
RO - ROMANIA	13	1840	1999	12	92	684	57	151	13	100	799	61	149
SK - SLOVAKIA	14	1900	1992	8	57	391	49	93	14	100	545	39	91
SI - SLOVENIA	12	1933	1999	12	100	487	41	67	12	100	457	38	67
ES - SPAIN	37	1911	1994	14	38	111	8	8	37	100	1391	38	82
SE - SWEDEN	25	1807	1998	25	100	805	32	91	18	72	658	37	186
CH - SWITZERLAND	25	1961	1997	25	100	358	14	33	9	36	234	26	32
TR - TURKEY	28	1937	1987	28	100	321	11	20	28	100	322	12	36
UA - UKRAINE	22	1884	1995	18	82	126	7	43	22	100	467	21	102
GB - UNITED KINGDOM	69	1883	2001	67	97	2800	42	119	53	77	2218	42	118
YU - YUGOSLAVIA	9	1926	1989	2	22	22	11	11	9	100	377	42	59

3 Data acquisition activities in the reporting period

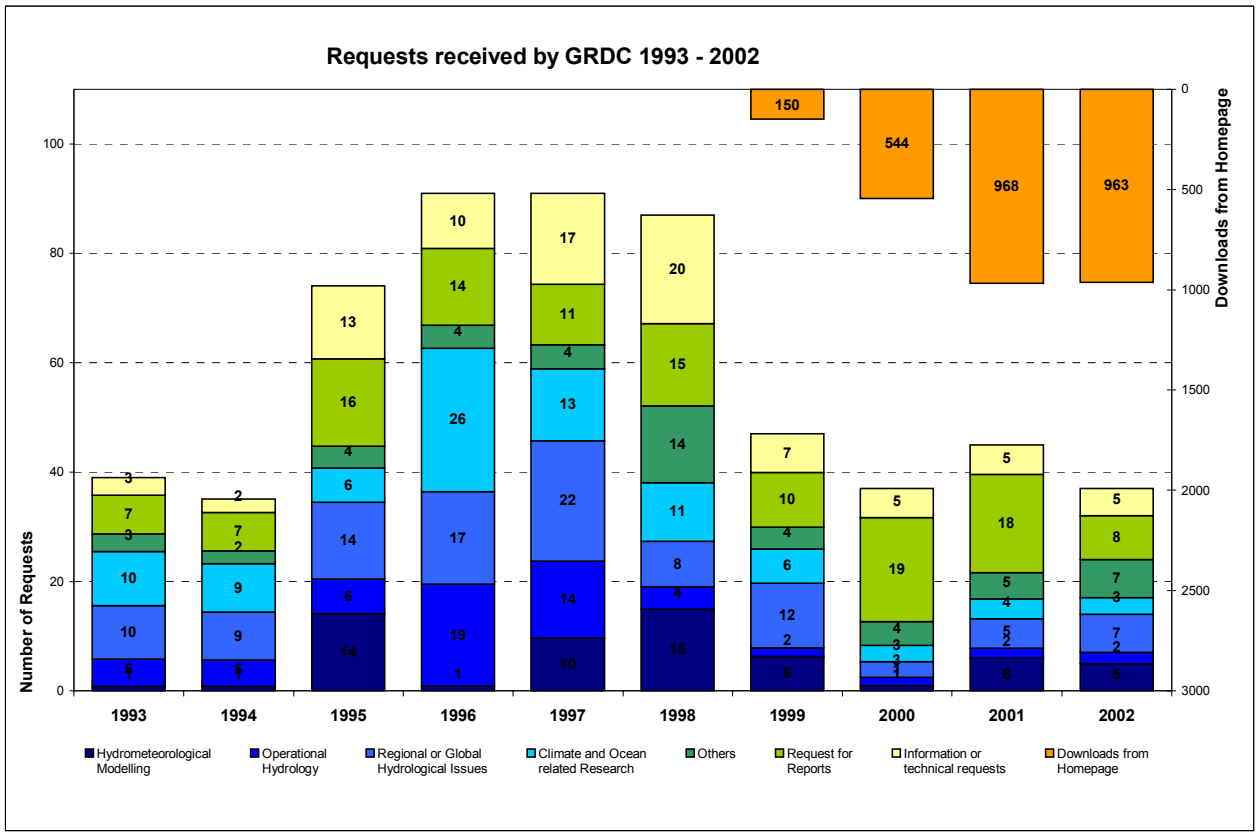
3.1 Summary statistics of number of contacts to countries/ by countries in the reporting period

WMO-Region	Country or Region	Type of contact			Receipt of data		Status of contact		
		pers	email	letter	discharge	metadata	first contact	follow up	interrupted
WR1	AOC FRIEND	1	1	0			1	1	1
WR1	BURUNDI	0	9	1	x		0	10	0
WR1	DEM REP CONGO	2	32	1	x	x	5	31	2
WR1	CENTRAL AFRICA	0	7	0			1	6	0
WR1	REP CONGO	0	7	0			1	6	0
WR1	ZAMBESI BASIN	0	6	0			1	5	0
WR1	NIGER BASIN	2	2	0			0	4	0
WR1	NAMIBIA	0	1	0			1	0	0
WR1	ISLE DE REUNION	1	2	2	x		1	4	0
WR1	ZAMBIA	0	11	1	x		2	10	0
WR2	AP FRIEND	2	9	0		x	3	8	0
WR2	BANGLADESH	0	0	1			1	0	0
WR2	CHINA	0	0	2			2	0	1
WR2	HKH FRIEND; NP	1	6	0			1	6	0
WR2	INDONESIA	1	1	0			1	0	0
WR2	INDIA	1	0	0			1	0	0
WR2	INDUS BASIN	0	0	1			1	0	0
WR2	JAPAN	0	7	4	x		5	6	0
WR2	SRI LANKA	0	1	0			1	0	0
WR2	MEKONG BASIN	0	6	1		x	2	5	0
WR2	MYANMAR	1	1	0			1	1	0
WR2	PAKISTAN	1	7	1			3	6	1
WR2	RUSSIA	10	9	7	x		10	10	0
WR2	VIETNAM	1	19	2	x		3	19	1
WR3	BRAZIL	0	0	2			2	0	0
WR3	PARAGUAY	1	1	0			0	1	1
WR4	CANADA	0	0	1			1	0	0
WR4	GREENLAND	0	1	0			0	1	1
WR4	UNITED STATES	0	0	1	x		1	1	0
WR5	AUSTRALIA	0	17	1	x		1	17	0
WR5	MALAYSIA	0	10	1	x		0	11	0
WR6	ANHY FRIEND	1	1	0			1	1	1
WR6	AUSTRIA	0	0	1			1	0	0
WR6	BALTEX	0	4	0			0	4	1
WR6	BULGARIA	0	1	0			0	1	1
WR6	SWITZERLAND	0	1	0			0	1	1
WR6	CZECH REP	0	0	1			1	0	0
WR6	DANUBE RIVER	0	4	1	x		1	4	0
WR6	FINLAND	0	5	0	x		0	5	0
WR6	FRANCE	0	0	2			2	0	1
WR6	HUNGARY	0	0	1			1	0	0
WR6	ISLAND	0	1	1			1	1	0
WR6	ITALY	0	0	1			1	0	1
WR6	LATVIA	0	0	0			0	1	1
WR6	NETHERLANDS	0	0	1			1	0	0
WR6	NORWAY	0	0	1			1	0	0
WR6	POLAND	0	2	1	x		1	3	1
WR6	SLOVENIA	0	3	2	x		1	4	0
Summary		**43**	**372**	**78**	**14**	**3**	**120**	**371**	**31**

4 Data dissemination and use

4.1 Development of data requests

Year	1996	1997	1998	1999	2000	2001	2002
Data requests	91	91	87	47	37	45	29
% change		0	-4	-46	-21	22	-36
Online Downloads	no download feasibility available			150	544	968	963
% change					263	78	-1



4.2 Data requests in the reporting period

Name	Country	Institution	Email address	Request (# of stations)	Purpose/Aim of study
Abdusselam	FR	Yokohama Institute for Earth	shibata@jamstec.go.jp	Worldwide (37)	Continental water & Energy
Donna Bower	UK	University of Birmingham	dxb808@bham.ac.uk	Europe (4)	River flow regime
Armin Bunde	DE	Universität Giessen	bunde@physik.uni-giessen.de	USA (3)	Analysis of scales
Kajsa Dahlstedt	UK	Imperial College London	k.dahlstedt@ic.ac.uk	Europe & S-America (5)	Analysis of correlated time-series
K. Hormann	DE	Global Precipitaion Climatology Centre	bruno.rudolf@dwd.de	Europa (22)	Rainfall-Runoff Analysis
Arnd Killingtveit	NO	Norwegian University of Science and Technology	aanund.killingtveit@bygg.ntnu.no	Europe (10)	Hydropower production
David Labat	FR	Laboratoire de Mécanisme de Transfert en Géologie Toulouse	labat@lmtg.ups-tise.fr	Worldwide (250)	Carbon cycle and hydrology
Manfred Mudelsee	DE	Universität Leipzig	mudelsee@rz.uni-leipzig.de	Europe (10)	Extreme flood events
Sonia Seneviratne	CH	Eidgenössische Technische Hochschule Zürich	sonia@geo.umnw.ethz.ch	Russia (3)	Soil moisture analysis
Jeffrey Shaman	US	Columbia University	jshaman@ldeo.columbia.edu	Asia (3)	Global studies of water balance
Kerstin Stahl	US	Oregon State University	geo-info@geo.orst.edu	Worldwide (950)	Water related political conflicts
Eisho Tanaka	JP	Japan Institute of Construction Engineering	kado@jice.or.jp	China (3)	Water balance studies
Dariusz Wrzesinski	PL	Adam-Mickiewicz-Universitaet Poznan	darwrze@main.amu.edu.pl	Europe (7)	Water balance studies
Chris Brooker	ZA	Brooker&Assoc	cbrooker@iafrica.com	Africa (1)	Flood hydrology analysis
Lincoln Fok	CN	University of Hong Kong	ifok02@hkucc.hku.hk	Asia (23)	Rainfall-Runoff Modelling
Martin Hirschi	CH	Eidgenössische Technische Hochschule Zürich	hirschi@geo.umnw.ethz.ch	Europe (1)	Water Budget Calculations
Lev Kitaev	RU	Moscow Institute of Geography	lkitaev@online.ru	Arctic (2110)	Arctic Research
Ronald Manley	UK	Water Resource Associates	ronald@watres.com	Jordanian (4)	River flow regime
Gwyn Rees	UK	Centre of Ecology and Hydrology	grees@ceh.ac.uk	Asia (16)	Snow and Glacier Hydrology
Kelly Rider	US	Texas A&M University	kellyrider@mail.ev1.net	Africa (1)	Water Circulation Study
David Rosenberg	US	University of California	derosenberg@ucdavis.edu	Jordanian (5)	Rainfall-Runoff Modelling
Daquing Yang	US	University of Alaska Fairbanks	ffdy@uaf.edu	Russia (30)	Climate and hydrology changes

4.3 GRDC Reports requested in the reporting period

Name	Country	Institution	Email	GRDC Report No
Anil Mishra	JP	Graduate School of Science & Technology, Kobe University	*mishra@ans.ans.kobe-u.ac.jp*	21,22,25,26
Dieter Gerten	DE	Potsdam-Institute for Climate Impact Research	*gerten@pik-potsdam.de*	22
K. Shadananan Nair	IN	Department of Physical Oceanography, Cochin University of Science & Technology	*nair59@yahoo.com*	21,22,25,26
Patrick L. Friend	UK	School of Ocean and Earth Science University of Southampton	*plf1@soc.soton.ac.uk*	22,28
Joe Helkowski	US	Center for Sustainability and the Global Environment (SAGE) University of Wisconsin - Madison	*jhhelkowski@students.wisc.edu*	22
Linda Mueller	DE	Max-Planck-Institut für Biogeochemie Jena	*lmueller@bgc-jena.mpg.de*	10,22
Michael Irlbeck	US	U.S. Agency for International Development Washington	*mlrlbeck@usaid.gov*	22

printed copies only, table does not include downloads from GRDC-Homepage

5 Data products

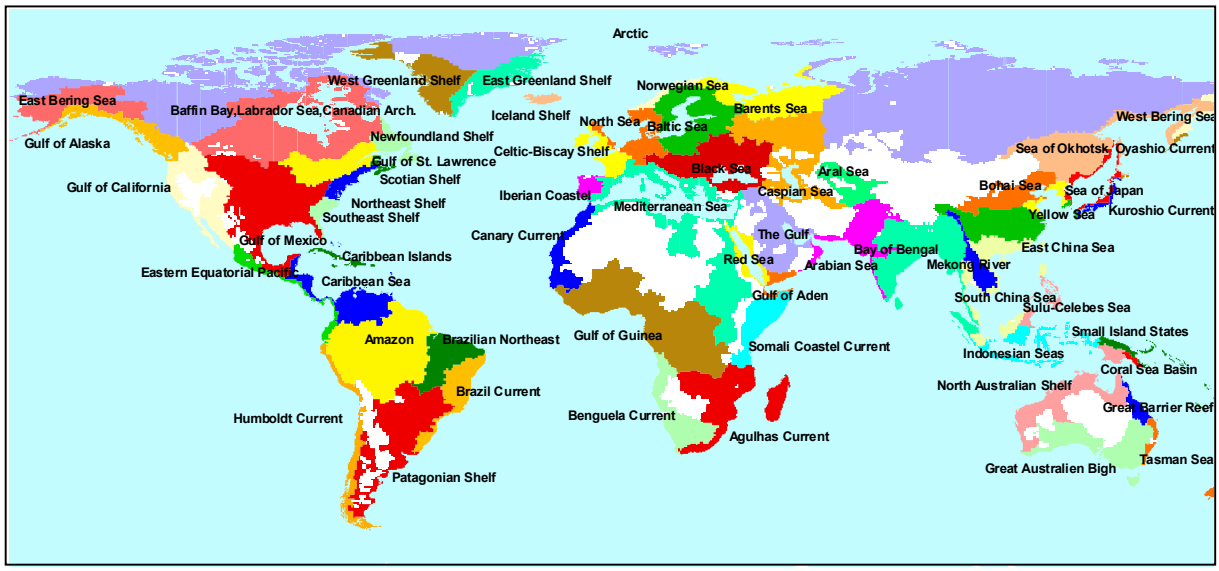
5.1 Mean Annual Freshwater Surface Water Fluxes into the World Oceans

Freshwater discharge from continents into the oceans is of major interest in research concerned with global monitoring of freshwater resources, the flux of matter into coastal areas and the open oceans, and the influence of freshwater fluxes on circulation patterns in the ocean and the atmosphere on regional and global scales.

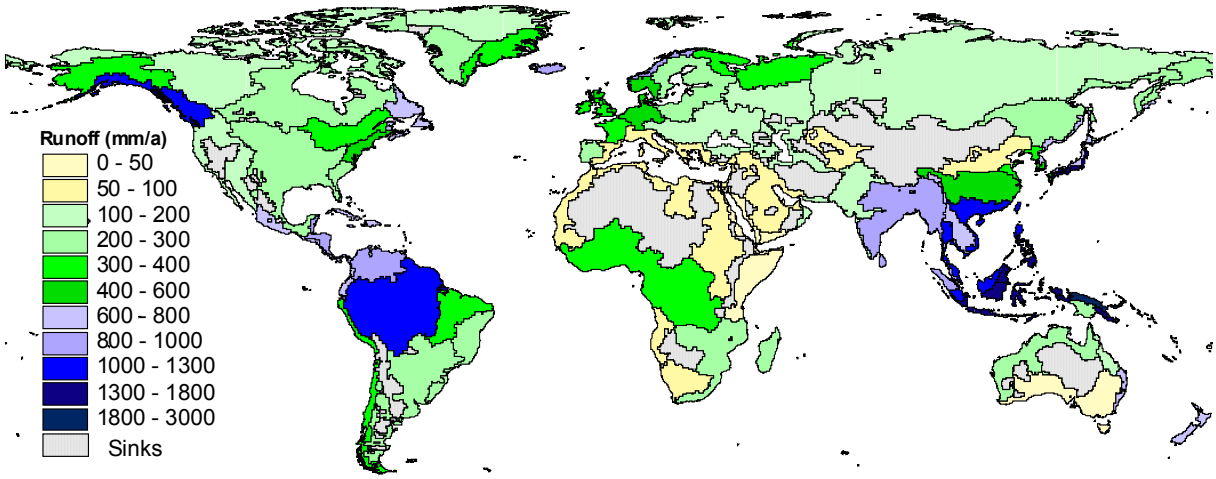
Following two previous publications of estimated Mean Annual Freshwater Surface Water Fluxes into the World Oceans based on 161 and 181 discharge stations, respectively (GRDC, 1996 and GRDC, 1998) the GRDC is currently reworking this exercise for a third time, now based on 251 discharge stations close to the estuary, featuring basin areas greater than 25.000 sqkm. The report is expected to be published in the course of the year 2003.

Discharge from land areas not integrally captured by GRDC stations has been determined via estimating mean annual runoff coefficients (RC) by means of regionalisation from nearby monitored areas taking into account data from another 1300 GRDC stations and applying precipitation data from the Global Precipitation Climatology Centre (GPCC).

Application of GIS analysis on a 0.5 degree elevation grid optimised for flow path detection allowed to determine the catchments of all the individual grid cells that form the fringe of the continents (around 16.000), i.e. all continental grid cells were co-registered with their respective fringe grid cell through which they drain to the oceans. Furthermore, each grid cell was assigned either a calculated or estimated RC. Thus, it is possible to calculate for each fringe grid cell the integral flux from its adjacent catchment as the spatially weighted product of RC and precipitation over all co-registered grid cells. Summarising the fluxes of subsets of continental fringe cells allows to estimate fluxes for arbitrary coastline sections. Exemplarily fluxes have thus been determined for the sub-regions defined by the Global International Waters Assessment (GIWA) initiative as well as for a global 10 degree grid. The results are compared to estimates by other authors and methods.



GIWA regions (Global International Waters Assessment initiative) and their associated catchment areas



Mean Runoff heights (mm/a) of the catchment areas associated with the GIWA regions. Derived from GRDC data and a 0.5 degree digital elevation model. Runoff from areas not covered by GRDC stations were determined by estimated runoff coefficients and mean annual precipitation for the period 1961-1990 as provided by the GPCC.

5.2 Long Term Mean Monthly Discharges and Annual Characteristics of Selected GRDC Stations

This GRDC data product offers statistics of discharge gauging stations in the GRDC database, selected according to the following criteria:

- station catchments have drainage area of more than 2.500 km^2
- station discharge data is available for a minimum of 10 years

Calculated quantities are:

- mean, minimum, maximum monthly discharge and its standard deviation
- time series of mean, minimum, maximum annual discharge

These statistical quantities may be useful e.g. for studies in low flow analysis, flood estimations, general atmospheric modelling as well as analysis of watershed management issues.

The present statistics are an extension to the previous (1998) version, where only 1352 stations could be selected according to above given criteria. The product is now based on more than twice as much stations, namely 3021, thanks to GRDC's success in data acquisition in recent years. The statistics are stored station-wise in ASCII-files. The readability of the data format has been improved and metadata as well as data quality information has been added. See annex 5 for an example of a station statistics file. These files are region-wise compressed in ZIP-archives and can be downloaded from the GRDC homepage.

The distribution of the data sets by WMO region is as given in the following table:

Region 1	Africa	299
Region 2	Asia	821
Region 3	South America	279
Region 4	North & Central America	887
Region 5	Australia & Pacific	116
Region 6	Europe & Mediterranean Asia	619
Total		**3021**

The general procedure to calculate the statistics follows the following rules:
- Original monthly values are used whenever available.
- In order to extend the time series, monthly data derived from daily values is added where applicable. In these cases, the calculation of a monthly value allows a maximum to 5 missing daily values.
- Long term monthly statistics are calculated only if at least five values of a specific month exist.
- Long term yearly characteristics are calculated only if at least nine monthly values of a year are existing.

Regarding the conditions of use for this data, the GRDC „Policy Guidelines for the Dissemination of Data“ (annex 8) apply, except that no written request needs to be sent to the GRDC. In particular, downloading and using the data implies acceptance of the user declaration attached to the Policy Guidelines. This includes no commercial use and the requirement to always fully cite the GRDC as the source in the references, literature or bibliography section within all publications applying GRDC data (The Global Runoff Data Centre, D-56002 Koblenz, Germany, <year>).

6 Public relations

6.1 GRDC homepage

The GRDC homepage is currently under a complete revision. The structure and parts of the contents have been revised during 2002. A new content management system (CMS) has been introduced in the BfG and will be the future platform for the web presentation of the GRDC. The draft homepage is already running in the BfG intranet. The top-level entries of the GRDC homepage will be:
- What's New
- Quick Access
- GRDC in Brief
- GRDC Background
- GRDC Collaborations and Cooperations
- GRDC Data, Products & Reports
- Downloads
- Categorised Links
- Alphabetic Glossary
- Contact & Directions

6.2 Recent publications/ GRDC Reports

During 2002 two new GRDC Reports have been published:

Report No. 27 (July 2002)	Water Resources Management Country Profile Germany. A contribution to the Global Water Information Network WWW.GLOBWINET.ORG / R. Winnegge and T. Maurer (32 pp)
Report No. 28 (Nov 2002)	Report of the Fifth Meeting of the GRDC Steering Committee, Koblenz, Germany, 25-28 June 2001 (36 pp, annex 300 pp)

Annex 2 lists all GRDC Reports.

6.3 New information material

Various information materials of the GRDC exist. They are under permanent review and are published in the download section of GRDC's homepage. An overview of the materials is given in annex 3.

6.4 Conferences and meetings (attendance /presentations)

The following meetings have been attended by GRDC staff in the year 2002:

18.03.2002: 8th Northern European FRIEND Steering Committee meeting, Cape Town, South Africa. (also presentations to the Southern African and West and Central African Steering Committees).

19.-22.03.2002: 4th International FRIEND Conference: "FRIEND 2002 – Regional Hydrology: Bridging the Gap between Research and Practice", Cape Town, South Africa.

21.-24.04.2002: Second International Conference on Sustainable Management of Transboundary Waters in Europe, Miedzyzdroje, Poland.

25.04.2002: 7th meeting of the IHP/OHP-working group "FRIEND/ERB", Koblenz

13.-16.05.2002: Isotope Tracing of Hydrological Processes in Large River Basins, Research Coordination Meeting, Isotope Hydrology Section, IAEA, Vienna, Austria.

24.-27.06.2002: iEMSs 2002, International Conference on Integrated Assessment and Decision Support, International Environmental Modelling and Software Society, Lugano, Switzerland.

12.-14.08.2002: GCOS/IPCC Expert Meeting on the Preparation of the Second Report on the Adequacy of the Global Climate Observing Systems, NCAR, Boulder, CO, USA. In support of UNFCCC-SBSTA

09.09.2002: WEBS (Water and Energy Budget Study) Workshop, NASA/Goddard Institute for Space Studies (GISS), NYC, USA

10.-12.09.2002: GEWEX Hydrometeorological Panel (GHP), 8th meeting, International Research Institute (IRI) for Climate Prediction, Palisades, New York, USA

12.-13.09.2002: GEWEX Coordinated Enhanced Observation Period (CEOP) meeting, International Research Institute (IRI) for Climate Prediction, Palisades, New York, USA

14.-18.10.2002: GCOS/IPCC Drafting Workshop on the Preparation of the Second Report on the Adequacy of the Global Climate Observing Systems, Farnham, UK. In support of UNFCCC-SBSTA

18.-20.11.2002: GCOS/WMO Expert Meeting on "Hydrological Data for Global Studies", Toronto, Canada

21.-22.11.2002: Global Terrestrial Network of Hydrology (GTN-H) panel meeting, Toronto, Canada

25.-26.11.2002: Water in the Middle East and North Africa. Resources, Protection and Management. Environmental Symposium organised by the German-Arabian Society for Environmental Studies and the Center for Environmental Research, Goethe-University, Frankfurt/Main

7 Development and maintenance of the database and the DBMS

Besides the routinely performed activities like checking and importing of acquired discharge data as well as retrieving data to satisfy the data requests, a database requires continued development to enlarge the capabilities of information retrieval and to take into account the continuous development of soft- and hardware environments. During the year 2002 the GRDC database was migrated from a local server running Informix to a central BfG-server running Oracle. Various custom-made software tools for the management and retrieval of data had to be adjusted to the new environment, i.e. the GRDC base tool, import tool, plausibility tool, catalogue tool and backup tool.

Furthermore, the database concept and structure is under continuous development, i.e. elimination of redundancies, addition of structures for the storage of extra information as the spatial relation of stations (upstream, downstream), water level-discharge relations etc. The review and improvement of the metadata of all stations in the GRDC database was continued during the year 2002 and are expected to be finished in the year 2003.

8 Collaborations and cooperation projects

8.1 GTN-H

GTN-H, the Global Terrestrial Network for Hydrology is a recently started initiative of WMO and G3OS. The goal is to present world-wide near real time (NRT) data of 10 hydrological variables (See also: (1) Workshop in Geisenheim, 26-30 June 2000: "Global Hydrological Observation Network for Climate", report available at http://www.wmo.ch/web/homs/geisenheim.pdf and (2) Expert Meeting in Koblenz, 21-22 June 2001: "Implementation of a Global Terrestrial Network for Hydrology (GTN-H)", report available at http://www.wmo.ch/web/gcos/Publications/gcos-71.pdf).

The project has been recognised during the Eleventh Session of the WMO Commission for Hydrology (CHy) in Abuja from 6-16 November 2000 (see items 19.1.17-19 of the report). From 18-20 November 2002 a subsequent WMO Expert Meeting on "Hydrological Data for Global Studies" was held in Toronto, Canada, followed by a meeting of the GTN-H coordination panel from 21-22 November again in Toronto.

One of GRDC's contributions to GTN-H will be the creation of an internet based Near Real Time (NRT) Monitor tool for discharge data (GRDC NRT-Monitor).
The core of the project will be a software to collect NRT-discharge data from distributed sites in the internet and make it available in a harmonised way via the internet and a software to display the collected and harmonised NRT-discharge data graphically in a web page by means of an internet map server similar to the USGS WaterWatch (http://water.usgs.gov/waterwatch), that displays the occurrence probability of the currently measured NRT-discharge values based on the long term characteristics.

It is espected that the benefit of such a system to provide easier, unified access to information on NRT discharge data will serve as a stimulating good example for the international exchange of hydrological data by providing a visible platform.

Previous achievements that GRDC intends to apply in this project are a prototype of a NRT-Monitor that has already been developed by GRDC in the framework of the European Flood Forecasting System (EFFS) and an Internet Map Server (IMS) which is available at the BfG and which will be made available to implement the planned mapping facility.

8.2 ACSYS/CliC

The GRDC constructs the Arctic Runoff Data Base (ARDB) on behalf of ACSYS. As GRDC's general task is to act as the global discharge inventory, it is committed to this task on a long term basis rather than project oriented.

The ARDB currently consists of 2110 runoff gauging stations, 246 of which are measured on a daily basis, while the remainder is measured only on a monthly basis. During 2002 the GRDC has succeeded in receiving an update of daily data for 20 stations of north-bound Russian rivers. The metadata of the data set can be explored by the GRDC-catalogue tool, available from the download section of the GRDC homepage.

The monthly data in the GRDC data set is basically a subset of the freely available Pan-Arctic river run-off data base compiled at the University of New Hampshire, USA (http://www.r-

arcticnet.sr.unh.edu/). However, around 100 station's coordinates have been adjusted manually due to obvious displacements revealed by visual inspection in comparison with various maps.

8.3 GEWEX, GHP, CEOP-I, ISLSCP-II

There are various GRDC activities in the framework of the Global Energy and Water Cycle Experiment (GEWEX, http://www.gewex.org/). GRDC is recognised as one of the hydrometeorological projects in GEWEX (http://www.gewex.org/projects.html). As such GRDC is member of the GEWEX Hydrometeorological Panel (GHP, http://www.usask.ca/geography/MAGS/GHP/ghp.html) and seeks to provide inputs to GHP Continental Scale Experiments (CSE) and modelling efforts by providing improved data sets. GRDC also collaborates with the GHP Data Management Working Group (DMWG, http://www.joss.ucar.edu/ghp/). The primary objective of the DMWG is to assist the GHP in the coordination and facilitation of data management activities/issues between the GEWEX Continental-scale Experiments (CSEs) and ISLSCP. Membership consists of a data management expert from each CSE and ISLSCP.

GRDC collaborates with the International Satellite Land Surface Climatology Project, Initiative II (ISLSCP-II, http://www.gewex.org/islscp.html) within the Global Energy and Water Cycle Experiment (GEWEX), where the GRDC together with the University of New Hampshire (UNH) will contribute

(a) discharge data to a comprehensive data collection for the 10 year period from 1986-1995, as well as
(b) with the Global Composite Runoff Fields based on GRDC data and developed in cooperation with UNH.

GRDC participates within the GEWEX initiative CEOP (Coordinated Enhanced Observation Period, http://monsoon.t.u-tokyo.ac.jp/ceop/index.html) for the coordination of observation campaigns of all on-going and planned CSEs (Continental Scale Experiments such as MAGS (Mackenzie), BALTEX (Baltic sea area), LBA (Amazon), GCIP (Mississippi), GAME (four regions in Asia). Inputs from GRDC will be the provision of discharge data in the vicinity of the reference sites and the MOLTS (model output location time series). GRDC also is ready to receive discharge data collected in the framework of CSE.

8.4 GLOBWINET

GLOBWINET (http://www.globwinet.org/) is one of the Associated Programmes of the Global Water Partnership (GWP, http://www.gwpforum.org) in the context of Integrated Water Resources Management (IWRM). GLOBWINET is funded by the German Federal Ministry for Economic Cooperation and Development (BMZ, http://www.bmz.de/en/index.html) and implemented by the German Agency for Technical Cooperation (GTZ, http://www.gtz.de/english/). In this project GRDC is a subcontractor of GTZ, responsible for triggering the provision of quality information on the German water resources sector for GLOBWINET.

GLOBWINET aims to provide an information platform for integrated water resources management. Basically, it is an internet-accessible database of water-administration related information around the globe which can be fed and administrated in a decentralised fashion. It

links the names of individuals, organisations and text materials. At present, the South African component SAWINET and the German component GEWINET are under development.

GRDC has been charged with building a "Water Resources Management Country Profile Germany", i.e. a concise compilation that provides easy access as a whole to various scattered and fragmented sources already reporting on different aspects of the German water management sector (GRDC Report 27). The core chapters of the report deal with "Geography and Hydrology", "Structures and Co-operation in Water Resources Management", "Legal Framework for Water Planning and Management" and "Usage of Water" in Germany. The electronic version of the report allows to directly link to the web-pages of most of the cited sources.

8.5 FRIEND metadata catalogue

At the 8th Northern European FRIEND Steering Committee meeting, held on 18 March 2002 in Cape Town, South Africa, GRDC presented a proposal entitled "Creation of a common metadatabase on world-wide runoff stations compiled from the individual FRIEND databases, the GRDC database and possibly other sources", which was included in the Technical Note circulated prior to the meeting. GRDC also presented the proposal to the Southern African and West and Central African Steering Committees. It was argued that a global metadatabase would provide an improved overview and accelerated access to data by summarising standardised information on the data available, even if it is held elsewhere. It was proposed that GRDC would maintain such a global metadatabase, but stressed the need to agree at the outset on a standardised list of metadata-entries (= catalogue columns) to ensure success. The meeting agreed to support GRDC's proposal and decided that the Database Group would liaise with GRDC on this issue

GRDC favoured establishing a FRIEND working group to coordinate this activity. GRDC felt the working group should ideally be composed of representatives from all contributing parties (in the first instance: Regional FRIEND Groups and GRDC) with the objective to decide on a standardised list of metadata-entries (= catalogue columns) as a prerequisite for successful compilation of the metadatabase. It was suggested that GRDC could liaise directly with each FRIEND Group. It also was suggested to discuss the matter further with the Chair of the FRIEND Inter-Group Coordination Committee (FIGCC).

8.6 Oregon State University

The research project "Study and examination of the influences of hydrologic variabilities and extremes on water related political conflicts and cooperation in international river basins" aims to develop discharge and precipitation derived hydrologic parameters, which describe the variability, extreme events and changes over time as they are important to human perception. These parameters will be related to intensity-coded events of conflict or cooperation over water, collected in a GIS based database by Prof. Dr. Aaron Wolf and his team at Oregon State University. This will provide an unique opportunity to study the link between hydrologic conditions and water related political conflict and cooperation.

For this study GRDC provides the requested relevant daily and monthly discharge data, all together 965 daily and 1603 monthly data sets free of charge. Based on the data of the GRDC, OSU will develop a data set of hydrological parameters (considering flow regimes,

variabilities, anomalies, flood and drought events etc.) and thus characterising the international river basins of the world. These parameters will be related to the intensity-coded events of conflict or cooperation over water as available from the Transboundary Freshwater Dispute Database (TFDD). OSU will provide - until September 2003 - the GRDC with an electronic version of a project report in English language to be published in the GRDC Report Series under the authors name(s). The report will elucidate the developed data set of hydrological parameters and also will draw conclusions related to international cooperation in the management of the international river basins. Optionally, depending on the success, the report will also cover the results obtained from the correlation efforts of the hydrological parameters and the coded political parameters of the TFDD.

Annex 1 List of GRDC staff

Global Runoff Data Centre (GRDC)
c/o Federal Institute of Hydrology
Kaiserin-Augusta-Anlagen 15-17
56068 Koblenz, Germany
Tel.: +49 261 1306 5224
Fax: +49 261 1306 5280
Email: grdc@bafg.de
Homepage: http://www.bafg.de/grdc.htm

Dr Thomas Maurer, Head
Tel.: +49 261 1306 5224
Fax: +49 261 1306 5671
email: thomas.maurer@bafg.de

Mrs Irina Dornblut, Deputy Head
Tel. +49 261 1306 5265
email: dornblut@bafg.de

Mr Johannes Pauler, Database Manager
Tel. +49 261 1306 5294
email: pauler@bafg.de

Mr Thomas de Couet, GIS Specialist
Tel. +49 261 1306 5269
email: decouet@bafg.de

Dr Thomas Lüllwitz, Data Requests
Tel. +49 261 1306 5879
email: luellwitz@bafg.de

Mrs Hilda Komlosi, Administration, Secretariat
Tel. +49 261 1306 5231
email: komlosi@bafg.de

Annex 2 List of GRDC Reports

Report No. 1 (May 1993) Second Workshop on the Global Runoff Data Centre, Koblenz, Germany, 15 - 17 June, 1992.
(17 pp, annex 73 pp)

Report No. 2 (May 1993) Dokumentation bestehender Algorithmen zur Übertragung von Abflußwerten auf Gitternetze. (incl. an English abstract in English by the GRDC: Documentation of existing algorithms for transformation of runoff data to grid cells) / G.C. Wollenweber.
(71 pp)

Report No. 3 (June 1993) GRDC - Status Report 1992.
(5 pp, annex 5 pp)

Report No. 4 (June 1994) GRDC - Status Report 1993.
(16 pp, annex 34 pp)

Report No. 5 (Nov 1994) Hydrological Regimes of the Largest Rivers in the World - A Compilation of the GRDC Database.
(275 pp)

Report No. 6 (Dec 1994) Report of the First Meeting of the GRDC Steering Committee, Koblenz, Germany, June 20 - 21, 1994.
(10 pp, annex 38 pp)

Report No. 7 (June 1995) GRDC - Status Report 1994.
(12 pp, annex 20 pp)

Report No. 8 (July 1995) First Interim Report on the Arctic River Database for the Arctic Climate System Study (ACSYS).
(34 pp)

Report No. 9 (Aug 1995) Report of the Second Meeting of the GRDC Steering Committee, Koblenz, Germany, June 27 - 28.
(17 pp, annex 34 pp)

Report No. 10 (March 1996) Freshwater Fluxes from Continents into the World Oceans based on Data of the Global Runoff Data Base / W. Grabs, Th. de Couet, J. Pauler
(49 pp, annex 179 pp)

Report No. 11 (April 1996) GRDC - Status Report 1995.
(16 pp, annex 45 pp)

Report No. 12 (June 1996) Second Interim Report on the Arctic River Database for the Arctic Climate System Study (ACSYS).
(39 pp, annex 8 pp)

Report No. 13 (Feb 1997) GRDC Status Report 1996
(25 pp, annex 36 pp)

Report No. 14 (Feb 1997) The use of GRDC - information. Review of data use 1993/1994. Status: January 1997
(18 pp, annex 34 pp)

Report No. 15 Third Interim Report on the Arctic River Data Base (ARDB) for the Arctic Climate

(June 1997) System Study (ACSYS): Plausibility Control and Data Corrections (Technical Report)

(3 pp, annex 20 pp)

Report No. 16 (Aug 1997) The GRDC Database. Concept and Implementation / J. Pauler, Th. de Couet

(38 pp, annex 4 pp)

Report No. 17 (Sep 1997) Report on the Third Meeting of the GRDC Steering Committee, Koblenz, Germany June 25-27, 1997

(30 pp, annex 137)

Report No. 18 (July 1998) GRDC Status Report 1997

(13 pp, annex 37 pp)

Report No. 19 (Aug 1998) Evaluation of Statistical Properties of Discharge Data of Stations Discharging Into the Oceans - Europe and Selected World-Wide Stations / F. Portmann

(80 pp)

Report No. 20 (July 1998) Water Resources Development and the Availability of Discharge Data in WMO Region II (Asia) and V (South-West Pacific) W. Grabs, J. Pauler, Th. de Couet

(51 pp, annex 68 pp)

Report No. 21 (Sep 1998) Analysis of long runoff series of selected rivers of the Asia-Pacific region in relation with climate change and El Niño effects / D. Cluis

(23 pp, annex 58 pp)

Report No. 22 (April 1999) Global, Composite Runoff Fields Based on Observed River Discharge and Simulated Water Balances / B. M. Fekete, C. Vörösmarty, W. Grabs

(36 pp, annex 77 pp)

Report No. 23 (Oct 1999) Report of the fourth Meeting of the GRDC Steering Committee, Koblenz, Germany, 23-25 June 1999

(29 pp, annex 140 pp)

Report No. 24 (Nov 1999) Use of the GRDC Data 1993-1999: A Comprehensive Summary

(48 pp)

Report No. 25 (June 2000) GIS-related monthly Balance of Water Availability and Demand in Large River Basins - case study for the River Danube / I. Dornblut

(27 pp, annex 46 pp)

Report No. 26 (Nov 2000) Modelling raster-based monthly water balance components for Europe / Carmen Ulmen

(133 pp)

Report No. 27 (July 2002) Water Resources Management Country Profile Germany. A contribution to the Global Water Information Network WWW.GLOBWINET.ORG / R. Winnegge and T. Maurer

(32 pp)

Report No. 28 (Nov 2002) Report of the Fifth Meeting of the GRDC Steering Committee, Koblenz, Germany, 25-28 June 2001

(36 pp, annex 300 pp)

also available from GRDC-Homepage as PDF-file

Annex 3 GRDC information available from the download section of the GRDC homepage

Overview of available materials

GRDC Station Catalogue	GRDC Reports	GRDC Data Products	GRDC Flyers and Posters	Background Material	WMO Resolutions	Maps and travel information

GRDC Reports (PDF format)

GRDC Report No.28	"Report on the Fifth Meeting of GRDC Steering Committee, Koblenz, Germany, 25-28 June 2001" • Version with annexes 1-39 • Version without annexes	12.0 MB 0.6 MB
GRDC Report No.27 [low resolution maps] [high resolution maps]	"Water Resources Management Country Profile Germany. A contribution to the Global Water Information Network WWW.GLOBWINET.ORG" by R. Winnegge and T. Maurer, July 2002 *The second version features high-resolution bitmaps of the four maps on basic components of the waterbalance as taken from the Hydrological Atlas of Germany (HAD)*	1.0 MB 6.0 MB
GRDC Report No. 26	"Modelling raster-based monthly water balance components for Europe" by C. Ulmen, Nov 2000	1.5 MB
GRDC Report No. 25	"GIS-related monthly balance of water availability and demand in large river basins" by I. Dornblut, Jun 2000	0.95 MB
GRDC Report No. 22	"Global composite runoff fields on observed river discharge and simulated water balances" by B.M. Fekete, Ch.J. Vorosmarty, W. Grabs, Oct 1999 (see also online version at http://www.grdc.sr.unh.edu)	10.8 MB

GRDC Data Products

Product 1: Freshwater Surface Water Fluxes into the World Oceans, Marginal and Inland Seas

Area	**Images** (JPG format)	**Long-term mean monthly discharges**
Arctic Ocean	arcjpg.zip ... 4,959 KB	arcxtr.zip ... 34 KB
Atlantic Ocean	atljpg.zip ... 14,136 KB	atlxtr.zip ... 84 KB
Indian Ocean	indjpg.zip ... 5,052 KB	indxtr.zip ... 33 KB
Pacific Ocean	pacjpg.zip .. 3,169 KB	pacxtr.zip ... 49 KB
Marginal & Inland Seas	margjpg ... 7,830 KB	margxtr.zip ... 28 KB

Product 2: Long-Term Mean Monthly Discharges from selected GRDC Stations

WMO-Region	**Data File**
Region 1: Africa	afrxtr.zip ... 299 KB
Region 2: Asia	asixtr.zip ... 821 KB
Region 3: South America	samxtr.zip ... 279 KB
Region 4: North & Central America	namxtr.zip ... 887 KB
Region 5: Australia & the Pacific	pacxtr.zip ... 116 KB
Region 6: Europe & Mediterranean Asia	eurxtr.zip ... 619 KB

GRDC Posters and Flyers (PDF format)

Flyer 1: Main introduction (922 KB)
Flyer 2: Supplemental information (812 KB)
Poster 1: Main GRDC poster 1 (1.329 MB)
Poster 2: Main GRDC poster 2 (1.040 MB)
Poster 3: GRDC contributes to GTN-H, The Global Terrestrial Network for Hydrology (1.251 MB)
Poster 4:GRDC contibutes to GLOBWINET, The Global Water Information Network (737 KB)
Poster 5: GRDC applies WABAL, Balancing of Water Availability and Demand in Large River Basins (378 KB)

GRDC Background Material (PDF format)

GRDC policy guidelines for the dissemination of data (116 KB)
GRDC Report list (78 KB)
GRDC station selection criteria and preferred station meta-data (117 KB)

WMO Resolutions (PDF format)

Resolution 25 (Cg XIII 1999)	Free and unrestricted exchange of hydrological data	199 KB
Resolution 21 (Cg XII 1995)	Support of GRDC's mission	192 KB
Resolution 40 (Cg XII 1995)	Free and unrestricted exchange of meteorological data	200 KB

Maps and travel information (PDF format)

Travel information from Frankfurt Airport
Route description Frankfurt Airport to Koblenz by car (120 k)
Map and addresses of hotels around the GRDC and the Central Railway Station (385 KB)
Map and addresses of lunch locations around the GRDC and the Central Railway Station (365 KB)

Annex 4 Data acquired in the reporting period (by countries and stations)

D: daily data N: new station
M: monthly data U: updated station

Country	Date	GRDC-No.	River	Station	from - to	D/M	N/U
Canada	05.02.02	4214005	FEUILLES (RIVIERE AUX)	EN AVAL DE LA RIVIERE PELADEAU	1962..1988	M	N
	05.02.02	4213720	NELSON RIVER	AT KELSEY GENERATING STATION	1960..1993	M	N
	05.02.02	4214015	GEORGE (RIVIERE)	AUX CHUTES HELEN	1962..1979	M	N
	05.02.02	4214030	BALEINE (GRANDE RIVIERE DE LA)	PRES DE L'EMBOUCHURE	1962..1993	M	N
	05.02.02	4214035	MELEZES (RIVIERE AUX)	PRES DE LA RIVIERE KOKSOAK	1962..1993	M	N
	05.02.02	4214040	CANIAPISCAU (RIVIERE)	A LA CHUTE DE LA PYRITE	1962..1993	M	N
	05.02.02	4214060	THELON RIVER	ABOVE BAKER LAKE	1973..1982	M	N
	05.02.02	4214070	THLEWIAZA RIVER	ABOVE OUTLET SEALHOLE LAKE	1978..1993	M	N
	05.02.02	4214080	ATTAWAPISKAT RIVER	BELOW MUKETEI RIVER	1968..1993	M	N
	05.02.02	4214100	QUOICH RIVER	ABOVE ST. CLAIR FALLS	1972..1993	M	N
	05.02.02	4214105	SEAL RIVER	BELOW GREAT ISLAND	1955..1993	M	N
	05.02.02	4214270	CHURCHILL RIVER 1	ABOVE RED HEAD RAPIDS	1972..1993	M	N
	05.02.02	4214025	HAYES RIVER	BELOW GODS RIVER	1974..1993	M	N
Cambodia	25.03.02	2569001	MEKONG	NEAK LUONG	1965..1971	D	N
	25.03.02	2569002	MEKONG	PHNOM PENH	1960..1973	D	N
	25.03.02	2569003	MEKONG	KOMPONG CHAM	1964..1974	D	N
	25.03.02	2569004	MEKONG	KRATIE	1960..1970	D	N
	25.03.02	2569005	MEKONG	STUNG TRENG	1960..1994	D	N
	25.03.02	2569010	BASSAC	PHNOM PENH	1963..1974	D	N
	25.03.02	2569015	PREK THNOT	ANLONG TOUK	1963..1969	D	N
	25.03.02	2569020	TONLE SAP	PREK KDAM	1960..1973	D	N
	25.03.02	2569025	STUNG SEN	KOMPONG THOM	1961..1970	D	N
	25.03.02	2569026	STUNG SEN	KOMPONG PUTREA	1965..1969	D	N
	25.03.02	2569030	STUNG SANGKER	SRE PONLOER	1964..1966	D	N
	25.03.02	2569031	STUNG SANGKER	TRENG	1963..1973	D	N
	25.03.02	2569035	STUNG PURSAT	TAING LUOCH	1965..1969	D	N
	25.03.02	2569040	SE SAN	BAN KOMPHUN	1960..1961	D	N
	25.03.02	2569041	SE SAN	VOEUN SAI	1965..1969	D	N
	25.03.02	2569045	SREPOK	LOMPHAT	1965..1969	D	N
	25.03.02	2569050	SE KONG	BAN KHMUON	1961..1969	D	N
	25.03.02	2569051	SE KONG	SIEMPANG	1965..1967	D	N
Laos	25.03.02	2469049	NAM KHAN	BAN-MIXAY (BAN MOUT)	1960..1994	D	U
	25.03.02	2469050	MEKONG	LUANG PRABANG (VIENKHAM)	1960..1992	D	U
	25.03.02	2469055	NAM LIK	BAN-HIN HEUP	1967..1992	D	U
	25.03.02	2469057	NAM NGUM	BAN-NA LUANG	1987..1992	D	U
	25.03.02	2469058	NAM NGUM	BAN-PAK KANHOUNG	1963..1992	D	U
	25.03.02	2469060	NAM OU	MUONG NGOY	1987..1992	D	U
	25.03.02	2469072	MEKONG	NEAR VIENTIANE	1960..1992	D	U
	25.03.02	2469091	NAM NHIEP	MUONG MAY	1987..1992	D	U
	25.03.02	2469095	SE BANG FAI	MAHAXAY	1988..1994	D	U
	25.03.02	2469098	SE BANG FAI	SE BANG FAI (BRIDGE 13)	1960..1985	D	U
	25.03.02	2469102	MEKONG	THAKHEK	1960..1972	D	N
	25.03.02	2469110	SE CAMPHONE	KENGKOK	1978..1992	D	U
	25.03.02	2469111	NAM THEUN	BAN-SIGNO	1986..1992	D	U
	25.03.02	2469112	NAM THEUN	KENGKUANG (KHAM KEUT)	1985..1993	D	N
	25.03.02	2469120	SE BANG HIENG	BAN KENG DONE	1960..1992	D	U
	25.03.02	2469121	SE BANG HIENG	TCHEPON	1988..1994	D	N
	25.03.02	2469125	SE XANG XOAY	BAN PHALANE	1978..1994	D	N
	25.03.02	2469127	SE THAMOUAK	HIGHWAY BRIDGE	1990..1990	D	N
	25.03.02	2469130	NAM CA DINH	BAN PHONE SY	1960..1986	D	N
	25.03.02	2469131	NAM CA DINH	TAT VANG FONG	1990..1990	D	N
	25.03.02	2469135	NAM SANE	MUONG BRIKHANE (MUONG KAO)	1987..1992	D	N
	25.03.02	2469140	NAM NGUM	THA NGON	1960..1988	D	N
	25.03.02	2469141	NAM NGUM	BAN THA LAT	1966..1994	D	N
	25.03.02	2469142	NAM NGUM	DAM SITE	1966..1970	D	N
	25.03.02	2469143	NAM LIK	MUONG KASI	1987..1992	D	N
	25.03.02	2469145	NAM SUONG	VANG VIENG	1987..1993	D	N
	25.03.02	2469146	NAM SUONG	BAN HAT KHANG	1960..1960	D	N
	25.03.02	2469147	NAM OU	BAN TEUNG	1960..1961	D	N
	25.03.02	2469148	NAM KHNA	BAN PAK BAN (DOWNSTREAM)	1985..1992	D	N
	25.03.02	2469149	NAM PA	BAN KOK VAN	1988..1992	D	N
	25.03.02	2469260	MEKONG	PAKSE	1960..1992	D	U
	25.03.02	2469261	MEKONG	BAN CHAN NOI	1960..1964	D	N
	25.03.02	2469265	SEDONE	SOUVANNA KHILI	1986..1994	D	U
	25.03.02	2469266	SEDONE	BAN NANAY	1960..1968	D	N
	25.03.02	2469267	SEDONE	KHONG SEDONE	1989..1994	D	N
	25.03.02	2469268	SEDONE	BAN DONE SE	1988..1988	D	N
	25.03.02	2469269	SEDONE	SARAVANE	1989..1994	D	N
	25.03.02	2469300	SE KONG	ATTOPEU (MUONG MAY)	1989..1992	D	U
	25.03.02	2469301	SE KONG	BAN CHANTANGAY	1960..1960	D	N
	25.03.02	2469400	NAM SUONG	BAN SIBOUNHOM (BAN SIEAO)	1967..1994	D	N

Viet Nam	25.03.02	2369005	MEKONG	MY THUAN	1960..1961	D	N
	25.03.02	2369010	BASSAC	CHAU DOC	1960..1973	D	N
	25.03.02	2369011	BASSAC	VAM CONG	1961..1964	D	N
	25.03.02	2369100	EA H'LEO	EA H'LEO	1990..1991	D	N
	25.03.02	2369800	DAK BLA	KONTUM	1967..1992	D	U
	25.03.02	2369901	EA KRONG RIVER	BUON BUR	1967..1992	D	N
	25.03.02	2369905	SREPOK	BAN DON	1992..1992	D	N
	25.03.02	2369906	KRONG BUK	BUONG KRONG BUK	1969..1974	D	N
	25.03.02	2369907	KRONG KHO	DUC XUYEN	1985..1994	D	N
Thailand	26.03.02	2969003	NAM MAE CHAI	BAN PONG NAM RON	1976..1981	D	N
	26.03.02	2969004	NAM MAE MAO	BAN MUANG CHUM	1976..1985	D	N
	26.03.02	2969005	NAM MAE WANG	BAN PA DAENG	1976..1981	D	N
	26.03.02	2969008	NAM MAE FANG	BAN SOP KHA	1977..1981	D	N
	26.03.02	2969009	NAM MAE FANG	BAN THA MAI LIAM	1969..1992	D	U
	25.03.02	2969010	MEKONG	CHIANG SAEN	1960..1992	D	U
	26.03.02	2969011	NAM MAE KOK	BAN THA TON	1969..1994	D	U
	26.03.02	2969013	NAM MAE KOK	CHIANG RAI	1977..1992	D	U
	26.03.02	2969014	NAM MAE KOK	DAM SITE	1970..1987	D	N
	26.03.02	2969015	NAM MAE KOK	BAN PONG NA KHAM	1967..1969	D	U
	26.03.02	2969016	NAM MAE PUN LUANG	DAM SITE	1976..1992	D	N
	25.03.02	2969017	HUAI MEA CHEDI	BAN NONG SRA	1977..1982	D	N
	26.03.02	2969018	NAM MAE CHAN	BAN HUAI YANO MAI	1975..1992	D	N
	26.03.02	2969019	NAM MAE KHAM	BAN PA YANG	1980..1992	D	N
	26.03.02	2969020	MEKONG	BAN KHOK SUAK	1967..1994	D	N
	26.03.02	2969025	NAM MAE SUAI	DAM SITE	1975..1992	D	N
	26.03.02	2969028	NAM MAE PUM	BAN MAE CHAI	1977..1982	D	U
	26.03.02	2969029	NAM MAE LAO	BAN THA SAI	1972..1992	D	U
	26.03.02	2969030	NAM ING	THOENG	1969..1992	D	U
	26.03.02	2969069	NAM HEUNG	BAN PAK HUAI	1967..1992	D	U
	26.03.02	2969071	MAE LOEI	BAN WANG SAI	1976..1992	D	N
	26.03.02	2969076	NAM PONG (E)	BAN KAE (SI CHOMPHU)	1978..1992	D	U
	25.03.02	2969077	HUAI LUANG	BAN THA TUM	1976..1986	D	U
	25.03.02	2969078	HUAI MONG	BAN KRUAT	1980..1985	D	U
	25.03.02	2969079	HUAI PHANIANG	BAN WANG MUN	1978..1984	D	U
	25.03.02	2969080	LAM CHOEN	BAN THA DUA	1978..1992	D	U
	25.03.02	2969081	HUAI RAI	BAN NONG KIANG	1975..1992	D	U
	26.03.02	2969082	LAM CHI	BAN CHOT	1975..1992	D	U
	26.03.02	2969083	LAM CHI	BAN KOK	1977..1987	D	U
	26.03.02	2969086	LAM PAO	KAMALASAI	1978..1981	D	U
	26.03.02	2969087	NAM MUN	SATUK	1979..1984	D	U
	26.03.02	2969090	MEKONG	NONG KHAI	1969..1992	D	U
	26.03.02	2969095	MEKONG	NAKHON PHANOM	1972..1992	D	U
	26.03.02	2969096	NAM KAM	NA-KAE	1975..1992	D	U
	26.03.02	2969100	MEKONG	MUKDAHAN	1960..1992	D	U
	26.03.02	2969101	MEKONG	KHONG CHIAM (BAN DAN)	1966..1994	D	N
	25.03.02	2969116	HUAI KHAYUNG	BAN HUAI KHAYUNG	1979..1992	D	U
	25.03.02	2969123	HUAI THAP THAN	BAN HUAI THAP THAN	1979..1986	D	U
	26.03.02	2969124	NAM MUN	RASI SALAI	1979..1992	D	U
	26.03.02	2969150	LAM CHI	YASOTHON	1960..1992	D	U
	26.03.02	2969151	LAM CHI	BAN KHAI (E23)	1979..1982	D	N
	26.03.02	2969152	LAM CHI	BAN BUNG KHA	1978..1982	D	N
	26.03.02	2969153	LAM CHI	KOSUM PHISAI	1973..1981	D	N
	25.03.02	2969160	HUAI RAI	BAN NONG TUM	1979..1982	D	N
	25.03.02	2969161	HUAI PA THAO	BAN TAO TON	1976..1992	D	N
	26.03.02	2969165	NAM PONG (W)	BAN PHA NOK KHAO	1979..1984	D	N
	26.03.02	2969166	NAM PONG (E)	PONG NEED	1963..1964	D	N
	26.03.02	2969167	NAM PHUAI	BAN KHOK LAM	1978..1984	D	N
	25.03.02	2969168	HUAI SOM	BAN HUA KHUA	1980..1984	D	N
	25.03.02	2969170	HUAI BONG	PHU WIANG (PHU MIANG)	1978..1981	D	N
	26.03.02	2969171	NAM PHROM	BAN PHROM THAI	1978..1984	D	N
	26.03.02	2969200	NAM MUN	UBON	1960..1992	D	U
	26.03.02	2969210	LAM DOM YAI	BAN FANG PHE	1969..1992	D	U
	26.03.02	2969211	LAM DOM YAI	DEJ UDOM	1963..1976	D	N
	26.03.02	2969220	NAM MUN	KAENG SAPHU TAI (DOWNSTREAM)	1979..1992	D	U
	26.03.02	2969221	NAM MUN	BAN HUA HEO	1972..1981	D	N
	26.03.02	2969230	NAM MUN	THA TUM	1973..1982	D	N
	26.03.02	2969231	NAM MUN	CHUMPHON BURI	1979..1982	D	N
	26.03.02	2969232	NAM MUN	BAN BUNG BAO	1979..1984	D	N
	26.03.02	2969233	NAM MUN	CHOK CHAI	1979..1981	D	N
	26.03.02	2969234	NAM MUN	BAN SOM	1979..1986	D	N
	25.03.02	2969235	LAM CHAE	BAN MAK KRAT	1977..1985	D	N
	26.03.02	2969237	LAM PHANG CHU	BAN HUA SAPHAN (M92)	1979..1981	D	N
	25.03.02	2969240	LAM CHI (TRIB. NAM MUN)	BAN LUM DIN	1979..1986	D	N
	26.03.02	2969245	LAM SIEO YAI	BAN KU PHRA KO NA	1979..1986	D	N
	26.03.02	2969248	LAM SIEO NOI	BAN YANG LOENG	1979..1981	D	N
	25.03.02	2969250	HUAI SAMRAN	SI SA KET	1979..1981	D	N
	26.03.02	2969255	LAM SE BAI	BAN NONG RUA (M32)	1979..1982	D	N
	26.03.02	2969256	LAM SE BOK	BAN THA BO BAENG	1979..1981	D	N
	25.03.02	2969257	HUAI KHONG	BAN THA SI CHOM CHUN	1980..1986	D	N
	25.03.02	2969400	HUAI BANG	NEAR BAN KHAM SOI	1964..1977	D	N
	25.03.02	2969410	HUAI HI	BAN NONG YANG	1980..1989	D	N
	26.03.02	2969415	NAM YANG	BAN NA THOM	1979..1992	D	N
	25.03.02	2969417	HUAI BANG SAI	BAN NONG AEK BRIDGE	1969..1981	D	N
	26.03.02	2969420	NAM SONGKHRAM	BAN THA KOK DAENG	1965..1975	D	N
	25.03.02	2969425	HUAI LUANG	NONG WUA SO (KH 53)	1980..1982	D	N
	25.03.02	2969430	MEKONG	CHIANG KHAN	1967..1992	D	N
	26.03.02	2969435	NAM SAN	DAM SITE	1966..1994	D	N
	26.03.02	2969437	NAM MAN	DAN SAI	1967..1992	D	N
	26.03.02	2969439	NAM MANG	BAN HAT KAY	1989..1989	D	N
	26.03.02	2969440	NAM ING	KHAO ING ROD	1977..1981	D	N
	26.03.02	2969441	NAM ING	BAN RAI-2	1979..1981	D	N
	26.03.02	2969442	NAM ING	BAN RAI-1	1977..1982	D	N
	25.03.02	2969450	HUAI THON	BAN PHO TAK	1980..1988	D	N
	26.03.02	2969451	NAM SUAI	BAN SOM-AD	1980..1981	D	N
	26.03.02	2969452	NAM MO	SI BUN RUANG	1978..1981	D	N

	26.03.02	2969453	NAM OON	BAN PHO YAI	1981..1981	D	N
	26.03.02	2969460	MAE LOEI	WANG SAPHUN	1967..1994	D	N
	25.03.02	2969500	HUAI BANG SAI	BAN NA KHAM NOI	1984..1992	D	N
	25.03.02	2969501	HUAI BANG SAI	NEAR KHAM LAI	1960..1965	D	N
	25.03.02	2969510	HUAI MONG	BAN NA ANG (KH 18)	1979..1982	D	N
	25.03.02	2969520	HUAI NAM YAM	BAN KHON SAI	1980..1982	D	N
	25.03.02	2969550	LAM DOM NOI	SAE FALLS	1960..1969	D	N
Thailand	24.04.02	2964120	CHAO PHRAYA	BAN BANG KAEO	1976..1997	D	U
	24.04.02	2964121	CHAO PHRAYA	WAT PHIKUN NGAM	1950..1956	D	N
	24.04.02	2964122	CHAO PHRAYA	KHAI CHIRA PRAWAT	1956..2000	D	N
	24.04.02	2964123	CHAO PHRAYA	BAN BANG KAEO 2	1950..1971	D	N
	24.04.02	2964124	CHAO PHRAYA	WAT PHROM	1955..1957	D	N
	24.04.02	2964125	CHAO PHRAYA	WAT SAWANG AROM	1955..1957	D	N
	24.04.02	2964127	CHAO PHRAYA	MIN BURI	1950..1969	D	N
	24.04.02	2964128	CHAO PHRAYA	WAT CHULA MANI	1950..1980	D	N
	24.04.02	2964130	CHAO PHRAYA	WAT PHO NGAM (BAN RE RAI)	1950..2000	D	U
	24.04.02	2964140	KHLONG WANG	BAN WANG KRATHUM	1966..1977	D	N
	24.04.02	2964145	HUAI YAI	BAN MAHA PHO	1966..1973	D	N
	24.04.02	2964147	KHLONG BANG KAEO	BAN IT	1978..1996	D	N
	24.04.02	2964150	SAKAE KRANG	ZTHAI THANI	1980..1996	D	N
	24.04.02	2964160	HUAI KHUN KAEO	BAN SAMO THONG	1983..2000	D	N
South Africa	02.05.02	1159100	ORANGE	VIOOLSDRIF	1935..2001	M	U
	02.05.02	1159300	ORANGE	UPINGTON	1942..2001	M	U
	02.05.02	1159500	VAAL	DE HOOP 65	1909..1946	M	U
	02.05.02	1159601	WONDERBOOM SPRUIT	DIEPKLOOF BURGERSDORP	1912..2001	M	N
	02.05.02	1159650	ORANGE	ALIWAL NOORD	1915..2001	M	U
	02.05.02	1159800	VAAL	ELANDSFONTEIN ENGELBRECHTSDRIFT	1915..1993	M	U
	02.05.02	1159900	KLIP	DELANGESDRIFT	1906..2001	M	U
	02.05.02	1160200	SWARTDORING	STRASSKIRCHEN	1967..2001	M	U
	02.05.02	1160220	LEEU	LEEUW	1970..2001	M	U
	02.05.02	1160300	BREE	CERES TOEKEN GEB.	1923..2001	M	U
	02.05.02	1160301	BREE	CERES TOEKEN GEB. WITBRUG	1950..2001	M	N
	02.05.02	1160320	DORING	ELANDS DRIFT ASPOORT	1923..2001	M	U
	02.05.02	1160350	TOUWS	ZANDFONTEIN	1969..1980	M	U
	02.05.02	1160400	MAALGATE	KNOETZE KAMA BUFFELS DRIFT	1961..2001	M	U
	02.05.02	1160450	HAARLEMSPRUIT	WELGELEGEN	1970..2001	M	U
	02.05.02	1160500	BOESMANS	DONKER HOEK ALICEDALE	1957..2001	M	U
	02.05.02	1160510	GROOT-VIS	BRANDT LEGTE PIGGOT'S BRIDGE	1935..2001	M	U
	02.05.02	1160550	OSKRAAL	WHITTLESEA	1964..1997	M	U
	02.05.02	1160580	GROOT-VIS	MATOLEMA'S LOCATION OUTSPAN	1969..2001	M	U
	02.05.02	1160600	KEISKAMMA	FARM 7	1969..2001	M	U
	02.05.02	1160650	MTAMVUNA	GUNDRIFT	1951..2001	M	U
	02.05.02	1160680	MZIMKULU	FP 1609030 THE BANKS	1949..2001	M	U
	02.05.02	1160700	MKOMANZI	LOT93.1821 CAMDEN	1960..2001	M	U
	02.05.02	1160710	MPOFANA	WELTVREDEN	1954..2001	M	U
	02.05.02	1160720	MGENI	PETRUS STROOM	1960..2001	M	U
	02.05.02	1160750	MOOI	DOORNKLOOF	1960..2001	M	U
	02.05.02	1160800	SLANG	VLAKDRIFT	1947..1993	M	U
	02.05.02	1160850	BUFFELS	TAYSIDE	1960..2001	M	U
	02.05.02	1160880	TUGELA	MANDINI	1959..2001	M	U
	02.05.02	1196300	MATLABAS	HAARLEM OOST	1962..2001	M	U
	02.05.02	1196350	MEGALIES	SCHEERPOORT	1922..2001	M	U
	02.05.02	1196400	LIMPOPO	BOTSWANA OXENHAM RANCH	1959..2001	M	U
	02.05.02	1196500	SAND	ZAMENKOMST	1947..1995	M	U
	02.05.02	1196550	LIMPOPO	BEITBRUG U/S	1955..1992	M	U
	02.05.02	1196551	LIMPOPO	BEIBRUG D/S	1992..2001	M	N
	02.05.02	1196600	OLIFANTS	WOLVEKRANS	1972..2001	M	U
	02.05.02	1196700	BLYDE	WILLEMSOORD	1911..2001	M	U
	02.05.02	1197300	INCOMATI	HOOGGENOEG	1909..2001	M	U
	02.05.02	1199100	MPULUZI	BUSBY	1963..2001	M	U
	02.05.02	1159100	ORANGE	VIOOLSDRIF	1935..2001	D	U
	02.05.02	1159500	VAAL	DE HOOP 65	1909..2001	D	U
	02.05.02	1159650	ORANGE	ALIWAL NOORD	1915..1993	D	U
	02.05.02	1160220	LEEU	LEEUW	1970..2001	D	U
	02.05.02	1160301	BREE	CERES TOEKEN GEB. WITBRUG	1950..2001	D	N
	02.05.02	1160350	TOUWS	ZANDFONTEIN	1969..2001	D	U
	02.05.02	1160450	HAARLEMSPRUIT	WELGELEGEN	1970..2001	D	U
	02.05.02	1160510	GROOT-VIS	BRANDT LEGTE PIGGOT'S BRIDGE	1935..1997	D	U
	02.05.02	1160580	GROOT-VIS	MATOLEMA'S LOCATION OUTSPAN	1969..2001	D	U
	02.05.02	1160650	MTAMVUNA	GUNDRIFT	1951..2001	D	U
	02.05.02	1160700	MKOMANZI	LOT93.1821 CAMDEN	1960..2001	D	U
	02.05.02	1160720	MGENI	PETRUS STROOM	1960..2001	D	U
	02.05.02	1160800	SLANG	VLAKDRIFT	1947..2001	D	U
	02.05.02	1160880	TUGELA	MANDINI	1959..2001	D	U
	02.05.02	1196350	MEGALIES	SCHEERPOORT	1922..2001	D	U
	02.05.02	1196500	SAND	ZAMENKOMST	1947..2001	D	U
	02.05.02	1196600	OLIFANTS	WOLVEKRANS	1972..2001	D	U
	02.05.02	1197300	INCOMATI	HOOGGENOEG	1909..2001	D	U
Australia	06.05.02	5606020	PALLINUP RIVER	BULL CROSSING	1973..2000	D	U
	06.05.02	5606030	KALGAN RIVER	STEVENS FARM	1976..2001	D	U
	06.05.02	5606040	KENT RIVER	STYX JUNCTION	1956..2001	D	U
	06.05.02	5606042	FRANKLAND RIVER	MOUNT FRANKLAND	1952..2000	D	U
	06.05.02	5606050	WARREN RIVER	BARKER RD CROSSING	1966..2001	D	U
	06.05.02	5606090	SCOTT RIVER	BRENNANS FORD	1969..2001	D	U
	06.05.02	5606100	BLACKWOOD RIVER	DARRADUP	1956..1999	D	U
	06.05.02	5606120	COLLIE RIVER EAST TRIB:	JAMES CROSSING	1967..2001	D	U
	06.05.02	5606130	MURRAY RIVER	BADEN POWELL WRT SPOUT	1952..2001	D	U
	06.05.02	5606140	SERPENTINE RIVER	SERPENTINE FALLS	1966..2001	D	U
	06.05.02	5606145	WIILIAMS RIVER	SADDLEBACK ROAD BRIDGE	1958..2001	D	U
	06.05.02	5606160	ELLEN BROOK	RAILWAY PARADE	1965..2001	D	U
	06.05.02	5607010	ARROWSMITH RIVER	ROBB CROSSING	1972..2000	D	U
	06.05.02	5607080	MURCHISON RIVER	EMU SPRINGS	1967..2001	D	U

	06.05.02	5607085	GASCOYNE RIVER	NINE MILE BRIDGE	1966..2000	D	U
	06.05.02	5607100	ASHBURTON RIVER	NANUTARRA	1967..2001	D	U
	06.05.02	5607200	MARILLANA CREEK	FLAT ROCKS	1957..2000	D	U
	06.05.02	5607400	FORTESCUE RIVER	JIMBEGNYINOO POOL	1972..2001	D	U
	06.05.02	5607450	PORTLAND RIVER	RECORDER POOL	1968..2000	D	U
	06.05.02	5607500	DE GREY RIVER	COOLENAR POOL	1974..2001	D	U
	06.05.02	5608020	FITZROY RIVER	FITZROY CROSSING	1965..2001	D	U
	06.05.02	5608023	FITZROY RIVER	DIMOND GORGE	1962..2000	D	U
	06.05.02	5608024	LEOPOLD RIVER	MT WINIFRED	1957..2000	D	U
	06.05.02	5608030	FLETCHER RIVER	DROMEDARY	1967..1999	D	U
	06.05.02	5608060	CHARNLEY RIVER	PANTA DOWNS	1971..1999	D	U
	06.05.02	5608090	CARSON RIVER	OLD THEDA	1955..1971	D	U
	06.05.02	5608095	MORGAN RIVER	MOONDOALNEE (THEDA)	1970..2000	D	U
	06.05.02	5608100	KING EDWARD RIVER	MT REID	1973..1999	D	U
	06.05.02	5608200	DURACK RIVER	NETTOPUS POOL KARUNJIE	1974..2000	D	U
	06.05.02	5608300	ORD RIVER	COLLIBAH POCKET	1971..2000	D	U
	06.05.02	5608400	ORD RIVER	OLD ORD HOMESTEAD	1967..2000	D	U
	03.06.02	5202227	SUGGAN BUGGAN RIVER	SUGGAN BUGGAN	1957..2002	D	U
	03.06.02	5302100	GENOA RIVER	THE GORGE	1972..2001	D	U
	03.06.02	5302220	DEDDICK RIVER	DEDDICK (CASEYS)	1964..2002	D	U
	03.06.02	5302229	SNOWY RIVER (SE AU)	JARRAMOND	1922..2002	D	U
	03.06.02	5302240	MITCHELL RIVER (SE AU)	ANGUSVALE (TABBERABBERA)	1975..1986	D	U
	03.06.02	5302242	MITCHELL RIVER (SE AU)	GLENALADALE	1937..2002	D	U
	03.06.02	5302245	WONNANGATTA RIVER	WATERFORD	1922..2002	D	U
	03.06.02	5302250	THOMSON RIVER	COOPER CREEK	1929..2002	D	U
	03.06.02	5302265	LOCH RIVER	NOOJEE	1957..2002	D	U
	03.06.02	5302270	TARWIN RIVER	MEENIYAN	1955..2002	D	U
	03.06.02	5302280	BUNYIP RIVER	HEADWORKS	1948..2001	D	U
	03.06.02	5302285	BASS RIVER	LOCH	1966..2002	D	N
	03.06.02	5302290	LITTLE YARRA RIVER	YARRA JUNCTION	1963..2001	D	U
	03.06.02	5302300	MARIBYRNONG RIVER	KEILOR	1908..2001	D	U
	03.06.02	5302320	MOORABOOL RIVER	BATESFORD	1908..2001	D	U
	03.06.02	5302325	BARWON RIVER	POLLOCKSFORD	1906..2001	D	U
	03.06.02	5302326	BARWON RIVER	EAST BRANCH AT FORREST ABOVE TUNNEL	1955..2002	D	N
	03.06.02	5302350	GELLIBRAND RIVER	CARLISLE	1964..1991	D	U
	03.06.02	5302351	ARKINS CREEK (W. BRANCH)	WYELANGRA	1958..2002	D	U
	03.06.02	5302365	HOPKINS RIVER	HOPKINS FALLS	1955..2001	D	U
	03.06.02	5302380	WANNON RIVER	DUNKELD	1920..2002	D	U
	03.06.02	5302400	GLENELG RIVER	DARTMOOR	1948..2001	D	N
	03.06.02	5302410	JIMMY CREEK	JIMMY CREEK	1950..2002	D	N
	03.06.02	5304019	MITTA MITTA RIVER	HINNOMUNJIE	1925..2002	D	U
	03.06.02	5304025	NARIEL CREEK	UPPER NARIEL	1954..2002	D	U
	03.06.02	5304030	BUCKLAND RIVER	HARRIS LANE	1972..2002	D	U
	03.06.02	5304035	DANDONGADALE RIVER	MATONG NORTH	1962..2002	D	U
	03.06.02	5304060	CAMPASPE RIVER	LAKE EPPALOCK (HEAD GAUGE)	1963..2001	D	U
	03.06.02	5304061	CAMPASPE RIVER	LAKE EPPALOCK (OUTLET MEAS. WEIR)	1963..2001	D	U
	03.06.02	5304062	CAMPASPE RIVER	ASHBOURNE	1933..2001	D	U
	03.06.02	5304063	CAMPASPE RIVER	LAKE EPPALOCK COMBINED (406219+406226)	1981..2001	D	U
	03.06.02	5304065	CAMPASPE RIVER	BARNADOWN	1977..2000	D	U
	03.06.02	5304069	CRESWICK CREEK	CLUNES	1943..2001	D	U
	03.06.02	5304070	LODDON RIVER	NEWSTEAD	1967..2001	D	U
	03.06.02	5304080	AVOCA RIVER	COONOOER	1889..2001	D	U
	03.06.02	5304081	AVOCA RIVER	AMPHITHEATRE	1966..2001	D	U
	03.06.02	5304140	MURRAY	BELOW WAKOOL JUNCTION	1929..2001	D	U
	03.06.02	5304150	AVON RIVER	WIMMERA HIGHWAY	1963..2001	D	U
	10.06.02	5402100	BLACKFORD DRAIN	AMTD 4.0 KM	1971..2001	D	U
	10.06.02	5402102	DRAIN M	AMTD 5.1 KM	1971..2001	D	U
	10.06.02	5402103	DRAIN L	SITE B - BGE AMTD 5.9 KM	1971..2001	D	N
	10.06.02	5402110	REEDY CREEK	7.2 KM NE OF SOUTH END	1971..2001	D	U
	10.06.02	5402390	MOSQUITO CREEK	STRUAN	1971..2001	D	U
	10.06.02	5404265	BURRA CREEK	WORLDS END	1974..2001	D	U
	10.06.02	5404270	MURRAY	OVERLAND CORNER (417.5 KM)	1985..2000	D	U
	10.06.02	5405031	ONKAPARINGA RIVER	CLARENDON WEIR	1937..2001	D	U
	10.06.02	5405035	SCOTT CREEK	SCOTT BOTTOM	1969..2001	D	U
	10.06.02	5405040	TORRENS RIVER	GORGE WEIR	1937..2000	D	U
	10.06.02	5405041	TORRENS RIVER	HOLBROOKS ROAD	1978..2000	D	U
	10.06.02	5405046	STURT RIVER	D/S ANZAC HIGHWAY	1990..2001	D	U
	10.06.02	5405048	BROWNHILL CREEK	ADELAIDE AIRPORT MORPHETT ROAD)	1993..2001	D	U
	10.06.02	5405051	NORTH PARA RIVER	PENRICE	1977..2001	D	U
	10.06.02	5405070	HILL RIVER	NEAR ANDREWS	1969..2001	D	U
	10.06.02	5405095	KANYAKA CREEK	OLD KANYAKA RUINS	1977..2001	D	U
	10.06.02	5405100	HINDMARSH RIVER	HINDMARSH VALLEY RES. OFFTAKE WEIR	1969..2001	D	U
	10.06.02	5405105	INMAN RIVER	U/S VICTOR HABOUR SEWAGE TREATMENT WORKS	1995..2001	D	U
	10.06.02	5405130	ROCKY RIVER	U/S GORGE FALLS (K.I.)	1970..2002	D	U
	10.06.02	5410100	COOPER CREEK	CALLAMURRA WATER HOLE	1973..2001	D	U
	11.06.02	5708110	VICTORIA RIVER	COOLIBAH HOMESTEAD	1953..2001	D	U
	11.06.02	5708125	EAST BAINES RIVER	VICTORIA HIGHWAY	1963..2001	D	U
	11.06.02	5708126	WEST BAINES RIVER	VICTORIA HIGHWAY	1961..2001	D	U
	11.06.02	5708130	DRY RIVER	MANBULLOO BOUNDARY	1968..2001	D	U
	11.06.02	5708140	GREEN ANT CREEK	TIPPERARY	1966..2001	D	U
	11.06.02	5708145	DALY	MOUNT NANCAR	1969..2001	D	U
	11.06.02	5708150	ELIZABETH RIVER	STUART HIGHWAY	1963..2001	D	U
	11.06.02	5708155	BLACKMORE RIVER	TUMBLING WATERS	1961..2001	D	U
	11.06.02	5708160	ADELAIDE RIVER	DIRTY LAGOON	1962..2001	D	U
	11.06.02	5708180	MARY RIVER	EL SHERANA ROAD CROSSING	1960..2001	D	U
	11.06.02	5708185	MARY RIVER	MOUNT BUNDEY	1956..2001	D	U
	11.06.02	5708190	UPPER LATRAM RIVER	U/S ELDO ROAD CROSSING	1971..2001	D	U
	11.06.02	5709020	ANGURUGU RIVER	U/S GROOTE EYLANDT MISSION	1969..2001	D	U
	11.06.02	5709100	ROPER RIVER	RED ROCK	1966..2001	D	U
	11.06.02	5709110	MACARTHUR RIVER	M.I.M PUMP	1969..2001	D	U
	11.06.02	5710060	TODD RIVER	ANZAC OVAL (WILLS TERRACE)	1972..2000	D	U
	11.06.02	5712090	TENNANT CREEK	OLD TELEGRAPH STATION	1972..1997	D	U
Russian Fed.	09.07.02	2901201	ANADYR	SNEZHNOYE	1989..1994	D	U
	09.07.02	2907400	SELENGA	MOSTOVOY	1936..1999	D	U

	09.07.02	2909150	YENISEI	IGARKA	1996..1999	D	U
	09.07.02	2910300	TOM	TOMSK	1918..1999	D	U
	09.07.02	2911100	IRTYSH	OMSK	1960..1979	D	U
	09.07.02	2912600	OB	SALEKHARD	1995..1999	D	U
	09.07.02	2998500	KOLYMA	SREDNEKOLYMSK	1995..1999	D	U
	09.07.02	2998510	KOLYMA	KOLYMSKOYE	1995..1998	D	U
	09.07.02	2999250	TAZ	SIDOROVSK	1995..1996	D	U
	09.07.02	2999500	PUR	SAMBURG	1991..1991	D	U
	09.07.02	6970100	ONEGA	POROG	1994..1998	D	U
	09.07.02	6970250	NORTHERN DVINA	UST PINEGA	1994..1998	D	U
	09.07.02	6970400	PINEGA	KULOGORY	1936..1988	D	U
	09.07.02	6970500	MEZEN	MALONISOGORSKOYE	1994..1998	D	U
	09.07.02	6970700	PECHORA	OKSINO	1994..1998	D	U
	09.07.02	6970701	PECHORA	UST-TSYLMA	1932..1979	D	U
South Africa	10.07.02	1159601	WONDERBOOM SPRUIT	DIEPKLOOF BURGERSDORP	1912..2001	D	U
	10.07.02	1159800	VAAL	ELANDSFONTEIN ENGELBRECHTSDRIFT	1915..1993	D	U
	10.07.02	1160300	BREE	CERES TOEKEN GEB.	1923..2001	D	U
	10.07.02	1160320	DORING	ELANDS DRIFT ASPOORT	1923..2001	D	U
	10.07.02	1160400	MAALGATE	KNOETZE KAMA BUFFELS DRIFT	1961..2001	D	U
	10.07.02	1160500	BOESMANS	DONKER HOEK ALICEDALE	1957..2001	D	U
	10.07.02	1160510	GROOT-VIS	BRANDT LEGTE PIGGOT'S BRIDGE	1935..2001	D	U
	10.07.02	1160550	OSKRAAL	WHITTLESEA	1964..1997	D	U
	10.07.02	1160680	MZIMKULU	FP 1609030 THE BANKS	1949..2001	D	U
	10.07.02	1160710	MPOFANA	WELTVREDEN	1954..2001	D	U
	11.07.02	1160750	MOOI	DOORNKLOOF	1960..2001	D	U
	11.07.02	1160850	BUFFELS	TAYSIDE	1960..2001	D	U
	11.07.02	1196300	MATLABAS	HAARLEM OOST	1962..2001	D	U
	11.07.02	1196400	LIMPOPO	BOTSWANA OXENHAM RANCH	1959..2001	D	U
	11.07.02	1196550	LIMPOPO	BEITBRUG U/S	1955..1992	D	U
	11.07.02	1196551	LIMPOPO	BEIBRUG D/S	1992..2001	D	U
	11.07.02	1196700	BLYDE	WILLEMSOORD	1911..2001	D	U
	11.07.02	1199100	MPULUZI	BUSBY	1963..2001	D	U
USA	15.07.02	4123155	CONASAUGA RIVER	NEAR ETON,GA	1981..2001	D	N
	15.07.02	4123150	HIWASSEE RIVER	ABOVE MURPHY, NC	1897..2001	D	N
	15.07.02	4123061	TENNESSEE RIVER	WHITESBURG, AL	1924..2001	D	N
	15.07.02	4120960	LOWER POWDER RIVER	ABOVE DRY CREEK NEAR WESTON, WY	1972..2001	D	N
	15.07.02	4125026	NEOSHO RIVER	NEAR PARSONS, KS	1921..2001	D	N
	15.07.02	4125027	NEOSHO RIVER	NEAR COMMERCE, OK	1939..2000	D	N
	15.07.02	4125028	NEOSHO RIVER	NEAR CHOUTEAU, OK	1937..2000	D	N
	15.07.02	4125205	FOURCHE MALINE	NEAR RED OAK, OK	1938..2000	D	N
	15.07.02	4125210	JAMES FORK	NEAR HACKETT, AR	1958..2000	D	N
	15.07.02	4125200	POTEAU RIVER	NEAR PANAMA, OK	1989..2000	D	N
	15.07.02	4127610	COLDWATER RIVER	NEAR OLIVE BRANCH, MS	1996..2000	D	N
	15.07.02	4126815	ELM FORK OF NORTH FORK RED RIVER	NEAR CARL, OK	1959..2000	D	N
	15.07.02	4126810	NORTH FORK RED RIVER	NEAR HEADRICK, OK	1905..2000	D	N
	15.07.02	4126803	RED RIVER	NEAR BURKBURNETT, TX	1960..2000	D	N
	15.07.02	4151514	PECOS RIVER	NEAR PUERTO DE LUNA, NM	1938..2000	D	N
	15.07.02	4151513	PECOS RIVER	BELOW SUMNER DAM, NM	1912..2000	D	N
	15.07.02	4151512	PECOS RIVER	BELOW TAIBAN CREEK NEAR FORT SUMNER,NM	1992..2000	D	N
	15.07.02	4152101	COLORADO RIVER	A. LITTLE COLORADO RIVER NR DESERT VIEW	1989..2001	D	N
	15.07.02	4152466	LITTLE COLORADO RIVER	WOODRUFF, AZ	1905..2001	D	N
	15.07.02	4152470	PUERCO RIVER	NEAR CHAMBERS, AZ	1973..2001	D	N
	15.07.02	4152467	LITTLE COLORADO RIVER	NEAR JOSEPH CITY, AZ	1970..2001	D	N
	15.07.02	4118315	FLAMINGO WASH	DECATUR BLVD AT LAS VEGAS, NV	1992..2000	D	N
	15.07.02	4118320	AMARGOSA RIVER	TECOPA, CA	1961..2000	D	N
	15.07.02	4118317	CARUTHERS CREEK	NEAR IVANPAH, CA	1963..2000	D	N
	15.07.02	4116335	MIDDLE FORK SALMON RIVER	AT MOUTH NEAR SHOUP, ID	1993..2001	D	N
	15.07.02	4116181	SNAKE RIVER	NEAR ANATONE, WA	1958..2001	D	N
Burundi	05.08.02	1653230	BUZIMBA	GATETE	1975...1990	M	N
	05.08.02	1653220	DAMA	MBUGA	1971...1989	M	N
	05.08.02	1653194	GIKOMA	RUBIRIZI (E.12)	1970...1972	M	N
	05.08.02	1653195	GIKOMA	NYANKEMBE (L.12)	1972...1974	M	N
	05.08.02	1653161	GITENGE	NTAMBA 2	1979...1986	M	N
	05.08.02	1653162	GITENGE	RWEGURA 1	1979...1983	M	N
	05.08.02	1653224	JIJI	NDAGO	1974...1990	M	N
	05.08.02	1653150	KABURANTWA	MISSION	1979...1990	M	N
	05.08.02	1653160	KAGUNUZI	NDAVA	1971...1990	M	N
	05.08.02	1653180	MPANDA	AXE D	1979...1990	M	N
	05.08.02	1653181	MPANDA	RANDA (E.08)	1970...1971	M	N
	05.08.02	1653182	MPANDA	GATURA (L.08)	1979...1990	M	N
	05.08.02	1653140	MUHIRA	RUHAGARIKA	1979...1989	M	N
	05.08.02	1653193	MURAGO	KIVOGA	1980...1983	M	N
	05.08.02	1653225	MUREMBWE	BASSE (MUTAMBARA)	1971...1989	M	N
	05.08.02	1653222	MUREMBWE	HAUTE (RUMEZA)	1974...1990	M	N
	05.08.02	1653335	MUSASA	BUGIGA	1986...1990	M	N
	05.08.02	1653185	MUSENYI	MUSENYI (E.09)	1970...1982	M	N
	05.08.02	1653320	MUTSINDOZI	GICACA	1979...1981	M	N
	05.08.02	1653321	MUTSINDOZI	KAYOGORO	1986...1987	M	N
	05.08.02	1653330	MUYOVOZI	GIHOFI	1975...1990	M	N
	05.08.02	1653191	MUZAZI	RUGAZI (E.10)	1970...1973	M	N
	05.08.02	1653192	MUZAZI	L.10	1971...1981	M	N
	05.08.02	1653206	NTAHANGWA	MUTANGA (L.13)	1971...1982	M	N
	05.08.02	1653120	NYAKAGUNDA	MUSENYI	1979...1990	M	N
	05.08.02	1653130	NYAMAGANA	MURAMBI	1979...1990	M	N
	05.08.02	1653240	NYENGWE	RIMBO	1979...1987	M	N
	05.08.02	1653110	RUHWA	DOUANE	1979...1984	M	N
	05.08.02	1653310	RUKOZIRI	MAKORONKWE	1986...1990	M	N
	05.08.02	1653350	RUMPUNGWE	GISURU	1987...1990	M	N
	05.08.02	1653100	RUSIZI	GATUMBA	1975...1990	M	N
	05.08.02	1653210	RUZIBAZI	RUTUMO	1975...1989	M	N
	05.08.02	1653250	RWABA	NYANZA-LAC	1979...1989	M	N

	05.08.02	1653223	SIGUVYAYE	BURURI	1974...1990	M	N
	05.08.02	1670125	KANIGA	DISPENSAIRE	1975...1989	M	N
	05.08.02	1670200	KANYARU	NGOZI-BUTARE	1971...1991	M	N
	05.08.02	1670170	KAVURUGA	KAYENZI	1980...1982	M	N
	05.08.02	1670160	KAYONGOZI	NYANKANDA	1974...1990	M	N
	05.08.02	1670120	MUBARAZI	MURONGWE	1975...1990	M	N
	05.08.02	1670210	NDURUMU, TRIB. KANYARU	MARANGARA	1982...1990	M	N
	05.08.02	1670130	NDURUMU, TRIB. RUVUBU	SHOMBO	1988...1989	M	N
	05.08.02	1670150	NYABAHA	MUBUGA	1973...1990	M	N
	05.08.02	1670152	NYAKIJANDA	BUHINDA (K23)	1975...1990	M	N
	05.08.02	1670100	RUVUBU	BAC (MUYINGA)	1974...1989	M	N
	05.08.02	1670101	RUVUBU	GITEGA	1973...1989	M	N
	05.08.02	1670102	RUVUBU	GITONGO	1975...1990	M	N
	05.08.02	1670103	RUVUBU	BURASIRA	1975...1990	M	N
	05.08.02	1670104	RUVUBU	KANABUSORO	1975...1990	M	N
	05.08.02	1670140	RUVYIRONZA	KIBAYA	1974...1990	M	N
	05.08.02	1670141	RUVYIRONZA	MUYANGE	1986...1990	M	N
	05.08.02	1670145	WAGA	MUYANGE	1986...1990	M	N
Japan	18.09.02	2587081	TESHIO	PONPIRA	1993..2000	D	N
	18.09.02	2587082	TESHIO	BIFUKABASHI	1993..2000	D	N
	18.09.02	2587083	TESHIO	NAYOROOHASHI	1993..2000	D	N
	18.09.02	2587101	ISHIKARI	TSUKIGATA	1993..2000	D	N
	18.09.02	2587102	ISHIKARI	HASHIMOTOCHO	1993..2000	D	N
	18.09.02	2587103	ISHIKARI	OSAMUNAI	1993..2000	D	N
	18.09.02	2587104	ISHIKARI	INO	1993..2000	D	N
	18.09.02	2587105	SORACHI	AKABIRA	1993..2000	D	N
	18.09.02	2587106	YUBARI	KIYOHOROBASHI	1993..2000	D	N
	18.09.02	2587200	SHIRIBETSU	NAKOMA	1993..2000	D	N
	18.09.02	2587210	MU	MUKAWA	1993..2000	D	N
	18.09.02	2587220	SARU	BIRATORI	1993..2000	D	N
	18.09.02	2587230	ABASHIRI	HONGO	1993..1998	D	N
	18.09.02	2587240	TOKORO	KITAMI	1993..1998	D	N
	18.09.02	2587250	YUBETSU	KAISEI	1993..1998	D	N
	18.09.02	2587401	TOKACHI	OBIHIRO	1993..2000	D	N
	18.09.02	2587402	TOKACHI	KYOEIBASHI	1993..2000	D	N
	18.09.02	2587403	TOSHIBETSU	TOSHIBETSU	1993..2000	D	N
	18.09.02	2588101	OTA	IMURO	1993..2000	D	N
	18.09.02	2588201	KATASURA	NOSO	1993..2000	D	N
	18.09.02	2588202	KIZU	YAWATA	1993..2000	D	N
	18.09.02	2588203	UJI	YODO	1993..2000	D	N
	18.09.02	2588204	SETA	TORIIGAWA	1993..2000	D	N
	18.09.02	2588301	KISO	INUYAMA	1993..2000	D	N
	18.09.02	2588302	IBI	MANGOKU	1993..2000	D	N
	18.09.02	2588303	NAGARA	CHUSETSU	1993..2000	D	N
	18.09.02	2588304	NAGARA	SUNOMATA	1993..2000	D	N
	18.09.02	2588321	TENRYU	INA	1993..2000	D	N
	18.09.02	2588322	TENRYU	MIYAGASE	1993..2000	D	N
	18.09.02	2588481	FUJI	SHIMIZUBATA	1993..2000	D	N
	18.09.02	2588482	KAMANASHI	FUNAYAMABASHI	1993..2000	D	N
	18.09.02	2588483	FUEFUKI	TORINKYO	1993..2000	D	N
	18.09.02	2588501	ARA	YORII	1993..2000	D	N
	18.09.02	2588551	TONE	FUKAWA	1993..2000	D	N
	18.09.02	2588552	TONE	KAWAMATA	1993..2000	D	N
	18.09.02	2588553	TONE	FUTTO	1993..2000	D	N
	18.09.02	2588554	TONE	YATTAJIMA	1993..2000	D	N
	18.09.02	2588555	TONE	IWAMOTO	1993..2000	D	N
	18.09.02	2588556	EDO	NAGAREYAMA	1993..2000	D	N
	18.09.02	2588557	KINU	MITSUKAIDO	1993..2000	D	N
	18.09.02	2588558	OMOI	OTOME	1993..2000	D	N
	18.09.02	2588559	WATARESE	FUJIOKA	1993..2000	D	N
	18.09.02	2588560	KARASU	IWAHANA	1993..2000	D	N
	18.09.02	2588561	AGATSUMA	MURAKAMI	1993..2000	D	N
	18.09.02	2588600	MABECHI	KENYOSHI	1993..2000	D	N
	18.09.02	2588610	NARUSE	NODABASHI	1993..2000	D	N
	18.09.02	2588620	NATORI	NATORIBASHI	1993..2000	D	N
	18.09.02	2588630	TAMA	ISHIHARA	1993..2000	D	N
	18.09.02	2588640	KUJI	SAKAKIBASHI	1993..2000	D	N
	18.09.02	2588651	ABUKUMA	TATEYAMA	1993..2000	D	N
	18.09.02	2588652	ABUKUMA	FUSHIGURO	1993..2000	D	N
	18.09.02	2588653	ABUKUMA	MOTOIYMA	1993..2000	D	N
	18.09.02	2588654	ABUKUMA	SUKAGAWA	1993..2000	D	N
	18.09.02	2588655	SHIROISHI	FUNAOKAOHASHI	1993..2000	D	N
	18.09.02	2588701	KITAKAMI	OIZUMI	1993..2000	D	N
	18.09.02	2588702	KITAKAMI	KOZENJI	1993..2000	D	N
	18.09.02	2588703	KITAKAMI	SAKURAGIBASHI	1993..2000	D	N
	18.09.02	2588704	KITAKAMI	OTOKOYAMA	1993..2000	D	N
	18.09.02	2588705	KITAKAMI	ASAHIBASHI	1993..2000	D	N
	18.09.02	2588706	KITAKAMI	FUNADABASHI	1993..2000	D	N
	18.09.02	2588707	SARUGAISHI	YASUNO	1993..2000	D	N
	18.09.02	2588708	WAGA	HIROOMOTE	1993..2000	D	N
	18.09.02	2588709	EAI	ARAO	1993..2000	D	N
	18.09.02	2588800	KANO	TOKURA	1993..2000	D	N
	18.09.02	2588810	HINO	KUZUMO	1993..2000	D	N
	18.09.02	2588820	HII	OTSU	1993..2000	D	N
	18.09.02	2588830	TAKATSU	TAKATSUNO	1993..2000	D	N
	18.09.02	2588850	SENDAI	GYOTOKU	1993..2000	D	N
	18.09.02	2588900	ABE	TEGOSHI	1993..2000	D	N
	18.09.02	2588910	OI	KANZA	1993..2000	D	N
	18.09.02	2588920	MIYA	IWADE	1993..2000	D	N
	18.09.02	2589100	YOSHII	TSUSE	1993..2000	D	N
	18.09.02	2589101	YOSHII	MIYASU	1993..2000	D	N
	18.09.02	2589201	GONO	TSUGA	1993..2000	D	N
	18.09.02	2589202	GONO	OZEKIYAMA	1993..2000	D	N
	18.09.02	2589210	HIME	YAMAMOTO	1993..2000	D	N
	18.09.02	2589220	KUROBE	UNAZUKI	1993..2000	D	N

	18.09.02	2589230	SHO	DAIMON	1993..2000	D	N
	18.09.02	2589240	ARA	TSUZURAYAMA	1993..2000	D	N
	18.09.02	2589250	SEKI	TAKADA	1993..2000	D	N
	18.09.02	2589300	ASHIDA	YAMATE	1993..2000	D	N
	18.09.02	2589310	TAKAHASHI	HIWA	1993..2000	D	N
	18.09.02	2589320	ASAHI	MAKIYAMA	1993..2000	D	N
	18.09.02	2589350	KINO	FUNATO	1993..2000	D	N
	18.09.02	2589351	KINO	MITANI	1993..2000	D	N
	18.09.02	2589360	YAMATO	KASHIWARA	1993..2000	D	N
	18.09.02	2589370	KAKO	KUNIKANE	1993..2000	D	N
	18.09.02	2589380	IBO	KAMIGAWARA	1993..2000	D	N
	18.09.02	2589390	KUZURYU	NAKATSUNO	1993..2000	D	N
	18.09.02	2589410	YURA	FUKUCHIYAMA	1993..2000	D	N
	18.09.02	2589420	MARUYAMA	FUICHIBA	1993..2000	D	N
	18.09.02	2589501	SHINANO	IWASAWA	1993..2000	D	N
	18.09.02	2589502	CHIKUMA	TATEGAHANA	1993..2000	D	N
	18.09.02	2589503	CHIKUMA	KUISEGE	1993..2000	D	N
	18.09.02	2589504	CHIKUMA	IKUTA	1993..2000	D	N
	18.09.02	2589505	UONO	HORINOUCHI	1993..2000	D	N
	18.09.02	2589506	SAI	KOICHI	1993..2000	D	N
	18.09.02	2589551	AGA	YAMASHINA	1993..2000	D	N
	18.09.02	2589552	AGA	OYA	1993..2000	D	N
	18.09.02	2589600	IWAKI	GOSHOGAWARA	1993..2000	D	N
	18.09.02	2589610	KOYOSHI	TODOROKIBASHI	1993..2000	D	N
	18.09.02	2589620	AKA	HAMANAKA	1993..2000	D	N
	18.09.02	2589701	MOGAMI	SAGOSHI	1993..2000	D	N
	18.09.02	2589702	MOGAMI	INASHITA	1993..2000	D	N
	18.09.02	2589703	MOGAMI	NAGASAKI	1993..2000	D	N
	18.09.02	2589704	MOGAMI	NISHIOTSUKA	1993..2000	D	N
	18.09.02	2589705	SAKE	MAKI	1993..2000	D	N
	18.09.02	2589751	OMONO	JINGUJI	1993..2000	D	N
	18.09.02	2589752	OMONO	OMAGARIBASHI	1993..2000	D	N
	18.09.02	2589753	OMONO	OMONOGAWABASHI	1993..2000	D	N
	18.09.02	2589754	TAMA	NAGANO	1993..2000	D	N
	18.09.02	2589801	YONESHIRO	TAKANOSU	1993..2000	D	N
	18.09.02	2589802	YONESHIRO	JUNISHO	1993..2000	D	N
	18.09.02	2590101	CHIKUGO	ARASE	1993..2000	D	N
	18.09.02	2590200	ONGA	HINODEBASHI	1993..2000	D	N
	18.09.02	2590210	MATSUURA	MUTABE	1993..2000	D	N
	18.09.02	2590220	KIKUCHI	TAMANA	1993..2000	D	N
	18.09.02	2590230	SENDAI	ONOBUCHI	1993..2000	D	N
	18.09.02	2590301	KUMA	HITOYOSHI	1993..2000	D	N
	18.09.02	2590401	OYODO	HIWATASHI	1993..2000	D	N
	18.09.02	2591200	NIYODO	KAWAGUCHI	1993..2000	D	N
	18.09.02	2591201	NIYODO	INO	1993..2000	D	N
	18.09.02	2591210	SHIGENOBU	DEAI	1993..2000	D	N
	18.09.02	2591220	HIJI	OZU	1993..2000	D	N
	18.09.02	2591230	NAKA	FURUSYO	1993..2000	D	N
	18.09.02	2591801	YOSHINO	CYUOBASHI	1993..2000	D	N
	18.09.02	2591802	YOSHINO	IKEDA	1993..2000	D	N
	18.09.02	2587080	TESHIO	MARUYAMA	1993..2000	D	U
	18.09.02	2587100	ISHIKARI	ISHIKARI-OHASHI	1993..2000	D	U
	18.09.02	2587400	TOKACHI	MOIWA	1993..2000	D	U
	18.09.02	2588100	OTA	YAGUCHIL	1993..2000	D	U
	18.09.02	2588200	YODO	HIRAKATA	1993..2000	D	U
	18.09.02	2588250	SHINGU	OGA	1993..2000	D	U
	18.09.02	2588300	KISO	IMAWATARI	1993..1997	D	U
	18.09.02	2588320	TENRYU	KASHIMA	1993..2000	D	U
	18.09.02	2588480	FUJI	KITAMATSUNO	1993..2000	D	U
	18.09.02	2588500	ARA	OASHIBASHI	1993..2000	D	U
	18.09.02	2588550	TONE	KURIHASHI	1993..2000	D	U
	18.09.02	2588700	KITAKAMI	TOME	1993..2000	D	U
	18.09.02	2589200	GONO	KAWAHIRA	1993..2000	D	U
	18.09.02	2589400	JINTSU	JINTSUOHASHI	1993..2000	D	U
	18.09.02	2589500	SHINANO	OJIYA	1993..2000	D	U
	18.09.02	2589550	AGANO	MAOROSHI	1993..2000	D	U
	18.09.02	2589700	MOGAMI	TAKAYA	1993..2000	D	U
	18.09.02	2589750	OMONO	TSUBAKIGAWA	1993..2000	D	U
	18.09.02	2589800	YONESHIRO	FUTATSUI	1993..2000	D	U
	18.09.02	2590100	CHIKUGO	SENOSHITA	1993..2000	D	U
	18.09.02	2590300	KUMA	YOKOISHI	1993..2000	D	U
	18.09.02	2590400	OYODO	KASHIWADA	1993..2000	D	U
	18.09.02	2591100	WATARI (SHIMANTO)	GUDO	1993..2000	D	U
	18.09.02	2591800	YOSHINO	IWAZU	1993..2000	D	U
Australia	24.09.02	5202010	OXLEY RIVER	EUNGELLA	1947..2001	D	U
	24.09.02	5202020	TWEED RIVER	UKI	1967..2001	D	U
	24.09.02	5202030	RICHMOND RIVER	CASINO	1943..2001	D	U
	24.09.02	5202040	NYMBOIDA RIVER	NYMBOIDA	1909..2001	D	U
	24.09.02	5202043	CLARENCE RIVER	TABULAM	1912..2001	D	U
	24.09.02	5202044	CLARENCE RIVER	LILYDALE (NEWBOLD CROSSING)	1922..2001	D	U
	24.09.02	5202048	BIELSDOWN CREEK	DORRIGO #2 & #3	1947..2001	D	U
	24.09.02	5202049	ORARA RIVER	BAWDEN BRIDGE	1956..2001	D	U
	24.09.02	5202050	TAYLORS ARM	GRAYS CROSSING	1970..1989	D	U
	24.09.02	5202055	NAMBUCCA RIVER	BOWRAVILLE	1959..2001	D	U
	24.09.02	5202060	TIA RIVER	TIA	1927..2001	D	U
	24.09.02	5202065	STYX RIVER	JEOGLA	1918..2001	D	U
	24.09.02	5202067	BELLINGER RIVER	THORA	1955..2001	D	U
	24.09.02	5202070	MACLEAY RIVER	TURNERS FLAT	1945..2001	D	U
	24.09.02	5202075	HASTINGS RIVER	ELLENBOROUGH (KINDEE BRIDGE)	1945..2001	D	U
	24.09.02	5202080	MANNING RIVER	KILLAWARRA	1945..2001	D	U
	24.09.02	5202090	MAMMY JOHNSONS RIVER	PIKES CROSSING	1967..2001	D	U
	24.09.02	5202095	KARUAH RIVER	BOORAL	1968..2001	D	U
	24.09.02	5202100	HUNTER RIVER	MOONAM DAM SITE	1940..2001	D	U
	24.09.02	5202102	HUNTER RIVER	GRETA	1968..2000	D	N
	24.09.02	5202110	JILLIBY CREEK	U/S WYONG RIVER (DURREN LANE)	1972..1994	D	U

	24.09.02	5202115	JIGADEE CREEK	AVONDALE	1969..2001	D	U
	24.09.02	5202120	CAPERTEE RIVER	GLEN DAVIS	1970..2000	D	U
	24.09.02	5202130	SOUTH CREEK	MULGOA ROAD	1970..1999	D	U
	24.09.02	5202150	SHOALHAVEN RIVER	WARRI	1914..2000	D	U
	24.09.02	5202155	CORANG RIVER	HOCKEYS	1924..2000	D	U
	24.09.02	5202160	CLYDE RIVER (SE AU)	BROOMAN	1960..2001	D	U
	24.09.02	5202180	TUROSS RIVER	DS WADBILLIGA RIV.JUNCTION	1964..2001	D	U
	24.09.02	5202185	TUROSS RIVER	TUROSS VALE	1948..2001	D	U
	24.09.02	5202200	TOWAMBA RIVER	TOWAMBA	1970..2001	D	U
	24.09.02	5202225	DELEGATE RIVER	QUIDONG	1951..2001	D	U
	24.09.02	5204013	JINGELLIC CREEK	JINGELLIC	1965..2000	D	U
	24.09.02	5204018	MURRAY	BIGGARA	1948..2000	D	U
	24.09.02	5204100	MUTTAMA CREEK	COOLAC	1974..2001	D	U
	24.09.02	5204101	MURRUMBIDGEE RIVER	MAUDE WEIR	1936..2000	D	N
	24.09.02	5204102	MURRUMBIDGEE RIVER	NARRANDERA	1891..2000	D	N
	24.09.02	5204103	MURRUMBIDGEE RIVER	GUNDAGAI	1891..2000	D	N
	24.09.02	5204104	MURRUMBIDGEE RIVER	BURRINJUCK DAM	1961..2000	D	N
	24.09.02	5204105	MURRUMBIDGEE RIVER	MITTAGANG CROSSING	1926..2001	D	U
	24.09.02	5204106	MURRUMBIDGEE RIVER	D/S BALRANALD WEIR	1979..2000	D	N
	24.09.02	5204108	NUMERALLA RIVER	NUMERALLA SCHOOL	1947..2001	D	U
	24.09.02	5204120	ABERCROMBIE RIVER	HADLEY #2	1960..2000	D	U
	24.09.02	5204125	ROCKY BRIDGE CREEK	NEAR NEVILLE	1968..2000	D	U
	24.09.02	5204180	GWYDIR RIVER	BUNDARRA	1936..2001	D	U
	24.09.02	5204181	GWYDIR RIVER	YARRAMAN BRIDGE	1929..2000	D	N
	24.09.02	5204190	PEEL RIVER	CHAFFEY DAM	1968..2001	D	U
	24.09.02	5204195	COCKBURN RIVER	MULLA CROSSING	1936..2001	D	U
	24.09.02	5204210	BELL RIVER	NEWREA	1939..2001	D	U
	24.09.02	5204215	GREEN VALLEY CREEK	HILL END	1966..2001	D	U
	24.09.02	5204250	DARLING RIVER	LOUTH	1954..2000	D	U
	24.09.02	5204251	DARLING RIVER	BURTUNDY	1941..2000	D	N
	24.09.02	5204252	DARLING RIVER	MENINDEE WEIR 32	1958..2000	D	N
	24.09.02	5204253	GREAT DARLING ANABRANCH	WYCOT	1962..2000	D	N
	24.09.02	5204255	DARLING RIVER	BOURKE TOWN	1943..2001	D	U
	24.09.02	5204258	BOX CREEK	COBAR	1973..1993	D	U
	24.09.02	5204300	LACHLAN RIVER	BOOLIGAL	1907..2000	D	N
	24.09.02	5204301	LACHLAN RIVER	FORBES (COTTONS WEIR)	1939..1999	D	N
	24.09.02	5204302	LACHLAN RIVER	WYANGALA	1913..1998	D	N
	24.09.02	5204303	LACHLAN RIVER	NARRAWA	1960..1999	D	N
	24.09.02	5204400	MACQUAIRIE RIVER	OXLEY STATION	1943..1999	D	N
	24.09.02	5204401	MACQUAIRIE RIVER	D/S BURRENDONG DAM	1960..2000	D	N
	24.09.02	5204402	MACQUAIRIE RIVER	BRUINBUN	1947..1999	D	N
	24.09.02	5204450	BARWON RIVER (TRIB. DARLING, MURRAY)	BREWARRINA	1930..2000	D	N
	24.09.02	5204451	BARWON RIVER (TRIB. DARLING, MURRAY)	DANGAR BRIDGE (WALGETT)	1886..2000	D	N
	24.09.02	5204452	BARWON RIVER (TRIB. DARLING, MURRAY)	MOGIL MOGIL	1944..2000	D	N
	24.09.02	5204460	CULGOA RIVER	BRENDA	1960..2000	D	N
Slovenia	28.10.02	6546610	MURA	GORNJA RADGONA I	1999..1999	D/M	U
	28.10.02	6546802	DRAVA	BORL	1999..1999	D/M	U
	28.10.02	6545190	SAVA	RADOVLJICA I	1999..1999	D/M	U
	28.10.02	6545101	SAVA	HRASTNIK	1999..1999	D/M	U
	28.10.02	6545050	SAVA	CATEZ I	1999..1999	D/M	U
	28.10.02	6545400	LJUBLJANICA	MOSTE	1999..1999	D/M	U
	28.10.02	6545300	SAVINJA	VELIKO SIRJE I	1999..1999	D/M	U
	28.10.02	6545200	KRKA	PODBOCJE	1999..1999	D/M	U
	28.10.02	6549180	SOCA	LOG CEZSOSKI	1999..1999	D/M	U
	28.10.02	6549100	SOCA	SOLKAN I	1999..1999	D/M	U
Finland	12.11.02	6855401	PIELISJOKI	KALTIMO	1958..2001	D	N
	12.11.02	6855402	KALLAVESI	KALLAVESI-KONNUS+KARVIO	1931..2001	D	N
	12.11.02	6855250	LEPPÄVESI-PÄIJÄNNE	VAAJAKOSKI (HAAPAKOSKI)	1941..2001	D	N
	12.11.02	6855500	KARJAANJOKI	LOHJANJÄRVI-PELTOKOSKI	1938..2001	D	N
	12.11.02	6854150	EURAJOKI	PAPPILANKOSKI	1985..2001	D	N
	12.11.02	6854170	KARVIANJOKI	ETELÄJ.+POHJAJ.+LANKOSKI	1969..2001	D	N
	12.11.02	6854210	ÄHTÄVÄNJOKI	HERRFORS	1965..2001	D	N
	12.11.02	6854220	PERHONJOKI	TUNKKARI	1980..2001	D	N
	12.11.02	6854301	LESTIJOKI	SAARENPÄÄ	1980..2001	D	N
	12.11.02	6854320	PYHÄJOKI	TOLPANKOSKI (PYHÄNKOSKI)	1983..2001	D	N
	12.11.02	6854591	OULUJOKI,OULUJÄRVI	JYLHÄMÄ-(VAALA)	1950..2001	D	N
	12.11.02	6854610	KUIVAJOKI	LUUJOKI HAARAN ALA PUOLELLE	1965..2001	D	N
	12.11.02	6854620	SIMOJOKI	SIMO	1965..2001	D	N
	12.11.02	6854701	KEMIJOKI,KEMIJÄRVI	SEITAKORVA	1963..2001	D	N
	12.11.02	6854710	OUNASJOKI	MARRASKOSKI-IISINKI	1971..2001	D	N
	12.11.02	6830511	TENOJOKI	ONNELANSUVANTO	1993..2001	D	N
	12.11.02	6854101	KOKEMÄENJOKI	HARJAVALTA	1931..2001	D	N
	12.11.02	6855271	NILAKKA	ÄYSKOSKI	1993..2001	D	N
	12.11.02	6830100	PAATSJOKI	LAKE INARI OUTLET	1993..2001	D	U
	12.11.02	6854200	LAPUANJOKI	KEPPO	1993..2001	D	U
	12.11.02	6854300	LESTIJOKI	LAKE LESTIJARVI OUTLET	1993..2001	D	U
	12.11.02	6854400	KIIMINGINJOKI	HAUKIPUDAS	1993..2001	D	U
	12.11.02	6854500	OULUJOKI	NEAR THE MOUTH,MERIKOSKI	1993..2001	D	U
	12.11.02	6854590	OULUJOKI	LAKE LENTUA OUTLET	1993..2001	D	U
	12.11.02	6854600	IIJOKI	NEAR THE MOUTH RAASAKKA	1993..2001	D	U
	12.11.02	6854700	KEMIJOKI	NEAR THE MOUTH,ISOHAARA	1993..2001	D	U
	12.11.02	6854800	KALAJOKI	NEAR THE MOUTH,NISKAKOSKI	1993..2001	D	U
	12.11.02	6854900	KYRONJOKI	NEAR THE MOUTH,SKATILA	1993..2001	D	U
	12.11.02	6855100	VANTAANJOKI	NEAR THE MOUTH,OULUNKYLÄ	1993..2001	D	U
	12.11.02	6855200	KYMIJOKI	ANJALA	1993..2001	D	U
	12.11.02	6855280	KIVIJARVI	VUOSJÄRVI,HUOPANANKOSKI	1993..2001	D	U
	12.11.02	6855300	PORVOONJOKI	NEAR THE MOUTH,VAKKOLA	1993..2001	D	U
	12.11.02	6855400	VUOKSI	TAINIONKOSKI	1993..2001	D	U
Malaysia	29.11.02	5221100	GOLOK	RANTAU PANJANG	1985..2000	D	U
	29.11.02	5222055	ARAU	LADANG TEBU FELDA	1985..2000	D	N

	29.11.02	5222100	MUDA	LADANG VICTORIA	1985..2000	D	U
	29.11.02	5222150	MUDA	JENIANG	1985..1994	D	U
	29.11.02	5222300	KRIAN	SELAMA	1985..2000	D	U
	29.11.02	5222500	PERAK	ISKANDAR BRIDGE	1985..2000	D	U
	29.11.02	5222550	PLUS	KAMPUNG LINTANG	1985..2000	D	U
	29.11.02	5222700	BATANG	TANJUNG KERAMAT	1985..2000	D	U
	29.11.02	5222800	BIDOR	MALAYAN BIDOR TIN BHD	1985..2000	D	U
	29.11.02	5223100	KELANTAN	GUILLEMARD BRIDGE	1985..2000	D	U
	29.11.02	5223600	JELAI	JERAM BUNGOR	1985..2000	D	U
	29.11.02	5224200	LIPIS	BENTA	1985..2000	D	U
	29.11.02	5224305	TRIANG	CHENOR	1985..1997	D	N
	29.11.02	5224500	PAHANG	TEMERLOH	1988..2000	D	U
	29.11.02	5225500	TERENGGANU	KAMPUNG TANGGOL	1985..1991	D	U
	29.11.02	5225600	DUNGUN	JAMBATAN JERANGAU	1985..2000	D	U
	29.11.02	5226300	BERNAM	JAMBATAN S.K.C.	1985..2000	D	U
	29.11.02	5226500	SELANGOR	RANTAU PANJANG	1985..2000	D	U
	29.11.02	5226700	KLANG	KUALA LUMPUR (JAMBATAN SULAIMAN)	1985..2000	D	U
	29.11.02	5226800	LANGAT	DINGKIL	1985..2000	D	U
	29.11.02	5227100	LINGGI	SUA BETONG	1985..2000	D	U
	29.11.02	5227400	MELAKA	PANTAI BELIMBING	1985..2000	D	U
	29.11.02	5227800	MUAR	BULUH KASAP	1985..2000	D	U
	29.11.02	5228950	BEKOK	YONG PENG-LABIS	1985..2000	D	N
	29.11.02	5229200	KAHANG	BATU 26 JALAN KLUANG	1985..2000	D	U
	29.11.02	5229500	JOHOR	RANTAU PANJANG	1985..1999	D	U

Annex 5 Example of the data format of the GRDC long term mean monthly discharge station statistics

```
# GRDC-No.:          2903425
# River:             LENA
# Station:           UST-KUT
# Country:           RU
# Lat (dec. degree):    56.7700
# Lon (dec. degree):   105.6500
# Area (km**2):       71400.000
#
# General procedure to calculate the statistics:
# Original monthly values are used whenever available.
# In order to extend the time series, monthly data derived from daily values
# is added where applicable. Then the calculation of a monthly value
# allows a maximum to 5 missing daily values per month
#
# -999 indicates missing value or insufficient data
#
# Time series: 1936 - 1948
#
# Missing original monthly values (%): 17.00
# Missing original daily values (%):    not available
#
Number of values used for calc.:     |   127.000
Absolute minimum discharge (m**3/s): |    37.800
Absolute maximum discharge (m**3/s): |  1790.000
Average annual discharge (m**3/s):   |   402.554
Average annual volume (km**3/yr):    |    12.695
Average annual runoff (mm/yr):       |   177.801
#
# Long-term monthly characteristics (m**3/s)
# (Calculation requires at least 5 years of data)
Mo|Min       |Year|Max       |Year|Mean      |S. deviation|No. values
01|    45.800|1944|   171.000|1938|   101.200|    37.64067|   9
02|    39.700|1944|   149.000|1938|    85.222|    32.85977|   9
03|    37.800|1944|   149.000|1938|    81.589|    33.89430|   9
04|    79.600|1936|   693.000|1939|   281.422|   231.32462|   9
05|   594.000|1943|  1790.000|1941|  1141.818|   355.42926|  11
06|   211.000|1943|  1250.000|1942|   641.308|   360.34299|  13
07|   129.000|1943|  1480.000|1948|   607.000|   359.37097|  13
08|    97.000|1943|  1140.000|1948|   468.692|   252.89140|  13
09|   103.000|1943|  1010.000|1948|   457.462|   224.95651|  13
10|    85.800|1943|   383.000|1947|   267.380|   104.19906|  10
11|    56.000|1943|   242.000|1944|   158.633|    65.03188|   9
12|    50.500|1943|   215.000|1937|   138.878|    53.44971|   9
#
# Annual characteristics (m**3/s)
# (Calculation requires at least 9 months per year)
Year|Min       |Mo|Max       |Mo|Mean      |No. values
1936|    71.000|03|  1180.000|06|   410.442| 12
1937|    93.900|03|  1600.000|05|   379.933| 12
1938|   149.000|02|  1250.000|05|   499.833| 12
1939|    87.500|12|   694.000|05|   260.883| 12
1940|    52.400|03|  1010.000|07|   350.800| 12
1941|    79.000|03|  1790.000|05|   408.250| 12
1942|    80.900|12|  1360.000|05|   405.358| 12
1943|    50.500|12|   594.000|05|   164.333| 12
1944|    37.800|03|  1010.000|05|   332.525| 12
1945|   258.000|07|  1220.000|05|  -999.000|  5
1946|   383.000|09|  1020.000|05|  -999.000|  5
1947|   383.000|10|   607.000|07|  -999.000|  5
1948|   778.000|06|  1480.000|07|  -999.000|  4
```

Annex 6 GRDC history

In the framework of the First Global GARP Experiment (FGGE) activity the WMO had been entrusted to collect river discharge data sets to be used as inputs to or validation of Global Atmospheric Circulation Model studies.

This task was initially taken over by the Institute for Bioclimatology and Applied Meteorology (Prof. A. Baumgartner) starting with a data request letter dated from 11 August 1982 by the former WMO Secretary General A.C. Wiin-Nielsen.

Due to the retirement of Prof. A. Baumgartner he initiated a transfer of this task to BfG (Federal Institute of Hydrology, Germany) after the initial phase with a letter dated from 12 April 1984.

Subsequent discussions over 2 years involving

- the WMO Secretary General, G.P.O. Obasi
- the President of the German Weather Service (as the Permanent Representative of Germany with WMO) at that time Prof. Dr. E. Lingelbach,
- the President of BfG at that time, Dr. H. Knöpp, and Prof. H.-J. Liebscher of BfG,
- the German Foreign Office,
- the Federal Ministry of Education and Research and
- the Federal Ministry of Transport, Building and Housing

led finally to the foundation of GRDC and a permanent inclusion of GRDC's costs into the federal budget of the Ministry of Transport effective from 1988 (letters of 10 and 21 April 1986). There was also an intermediate financial support by the Federal Ministry of Education and Research in 1987 to ensure the database transfer.

The President of the German Weather Service in its role as the Permanent Representative of Germany with WMO informed WMO about this outcome with letter of 30 April 1986. GRDC officially became operative at 14 November 1988. The GRDC then started with funds of 55.000 DEM.

Annex 7 GRDC funding

GRDC is funded by the Government of Germany, more specific the Federal Ministry of Transport, Building and Housing which finances 85% of BfG as its scientific R&D organisation. (BfG's prime objective is to consult and support the German Federal Administration responsible for navigation in German Federal Waterways).

The core staff of GRDC is thus a permanent part of the BfG-budget and as such GRDC might be regarded as an in-kind contribution to the UN-System by the German Government.

GRDC currently operates with 4 permanent fulltime staff-members, i.e. 2 academics and 2 technicians. From dedicated BfG resources, 3 more part-time staff contribute to GRDC's work equivalent to approximately one more person.

In addition, GRDC is entitled to make use of the resources of BfG, i.e.

- rooms
- central administration
- IT-support
- copying and printing services
- mailing services
- funds for travelling
- funds to support the digitalisation of data (a limited amount)

Annex 8 Policy guidelines for the dissemination of data and costing of services

Preamble

The Global Runoff Data Centre (GRDC) operates under the auspices of the World Meteorological Organization (WMO), on the advice of its international Steering Committee and in co-operation with organisations such as UNESCO, UNEP, WHO and ICSU. These Guidelines regulate the acquisition and dissemination of hydrological data and the costing of services by the Global Runoff Data Centre under the Terms of Reference stipulated during the First Session of the Steering Committee of the GRDC and the commitments of WMO made at its Twelfth Congress in 1995.

At its Twelfth Congress, the World Meteorological Organization (WMO) adopted Resolution 40 (Cg-XII) and thus committed itself, as a fundamental principal, "to broadening and enhancing the free and unrestricted international exchange of meteorological and related data and products." In this context, "free and unrestricted" means non-discriminatory and without charge, the latter with the meaning "at no more than the cost of reproduction and delivery, without charge for the data and products themselves." With regard to the Global Runoff Data Centre, Congress also adopted Resolution 21 (Cg-XII) which encourages Members (countries) "to support the GRDC through the provision of the hydrological data and related information that it needs".

WMO Congress also adopted the practice that countries "should provide to the research and education communities, for their non-commercial activities, free and unrestricted access to all data and products exchanged under the auspices of WMO with the understanding that the commercial use of these data may be subject to conditions." Resolution XII-4 (Paris, September 1996) of the UNESCO Intergovernmental Council for the International Hydrological Programme (IHP) "invites Member States to review their policies for the international exchange of hydrological data so that they may be supportive of the research being undertaken on major global issues" and further "requests the IHP National Committees to work with their national Hydrological Services to provide the scientific community with access to hydrological data and information needed for research at regional and international levels... using the internationally recognised international data centres".

These Guidelines do not infringe on the ownership rights of the data transmitted to the GRDC by Members (countries and their national agencies) and other data providers. In particular, the GRDC does not usually provide to data users value-added and costed services which would normally fall in the domain of Members and other data providers, in particular national Hydrological Services.

1. Principles of data acquisition and access

1.1 The GRDC operates on the WMO principal mentioned above with the aim of encouraging the widespread use of the data for national, regional and global studies.

1.2 Members and other data providers are encouraged to transfer to the GRDC unrestricted, quality controlled, selected hydrological data, together with station history information. The transfer of daily discharge data is preferred.

2. Dissemination of GRDC-Data

2.1 GRDC data are available to users free and unrestricted under the conditions specified in 2.2 to 2.6 below.

2.2 Requests for data must reach the GRDC in written form: letter, facsimile, telex or email. A proforma is attached for use in this respect (Annex 1).

2.3 The data user agrees in writing that the data received are not transferred to third parties without the written consent of the GRDC. GRDC data are released upon identified access, e.g. a signed User Declaration (Annex 2)

2.4 GRDC data shall not be used for commercial purposes without the prior consent of Members and other providers of data to the GRDC. The GRDC will request such consent on behalf of a potential user.

2.5 The data user agrees that the GRDC may inform the Members and other data providers of data about the use to which their data have been put and will transfer the names and addresses of the data users to Members and other data providers concerned.

2.6 The GRDC makes available subsets of the GRDC database on request, as stated above. Requests for the entire database or substantial parts of it cannot be entertained unless consent of the WMO secretariat has been obtained.

3. Cost of services

3.1 Information about the GRDC, including the yearly status reports and the database catalogue, are provided free of charge upon request.

3.2 To enhance the services of the GRDC, the GRDC charges data users on a non-profit base for the time used for carrying out services and for costs of material, handling and mailing.

3.3 Standard GRDC services (Annex 3) are free for agencies and institutions which contribute data to the GRDC, as well as for the secretariats of international organizations which are the principal clients of the GRDC, such as WMO, UNESCO, UNEP and WHO.

3.4 For all other users, the cost for databank queries, diskettes, mail and all other overheads is based on the current price for services charged by the Federal Institute of Hydrology, Koblenz (Annex 4).

3.5 Under special arrangements, the cost for database queries may be waived for data users of developing countries.

4. Disclaimer

While the GRDC makes every effort to eliminate errors from the data base, there may be errors in the data unknown to the GRDC. Neither the GRDC nor its sponsors can be held responsible for the consequences of the use of GRDC data.

Annex 1
Format for Data Request from GRDC

Any request for data should provide the following information:

A) Origin of the request, including name, postal and/or e-mail address, phone and fax number of the individual person or institute making the request; where an institute, the name and the position of the responsible officer should also be provided.

B) Specification of request (e.g. which rivers, stations or regions, monthly or mean daily data, time series).

C) Rationale for the data request.

D) Detailed description of the use to be made of the data. A summary of the research or study project should be added to the request.

E) Signature of the person or responsible officer referred to in A) above.

Annex 2
Declaration of the Data User

The undersigned declares that he/she is cognisant of the GRDC Policy Guidelines for the Dissemination of Data and Costing of Services and is responsible for the use of the data provided by the GRDC. The undersigned agrees to use the data under the following conditions:

1. The GRDC data are not transferred either in part or total to third parties or to the general public (e.g. by electronic media), without the written consent of the GRDC.

2. The data will not be used for commercial purposes without the written consent of the GRDC. The GRDC itself will obtain clearance from the respective Members or other data providers prior to the release of data for commercial purposes.

3. The data set will be not accessible to unauthorised persons and, after completion of the specified studies, the data set will be kept separate from the general data processing facilities on diskette, tape or CD.

4. After completion of the studies and parts thereof, two copies of the results will be made available for the GRDC, as well as publications arising from the use of the data set or parts thereof.

5. In all publications, the source of the data will be fully cited as: "The Global Runoff Data Centre, D - 56002 Koblenz, Germany".

6. The GRDC operates on a non-profit basis. In certain cases, however, the GRDC may charge the data user a nominal amount for data queries and handling or an amount which has been agreed upon between the requesting agency and the GRDC prior to data delivery. The undersigned confirms his/her capacity to pay bills presented by the GRDC for services.

7. Disclaimer

While the GRDC makes every effort to eliminate errors from the data base, there may be errors in the data unknown to the GRDC. Neither the GRDC nor its sponsors can be held responsible for the consequences of the use of GRDC data.

I, as principal researcher/representative of the requesting organization, agree to the conditions stated above.

Place and date :_____

Signature :_____

Annex 3
Standard Services of GRDC

The following standard services are rendered on a routine basis and are distinguished from specialised services to data users:

Production and dissemination of catalogues and yearly status reports

Database queries and response to data requests including advisory services with regard to the use of the database

Compilation of project/programme related sub-databases

Production of tables and graphs to illustrate and enhance the understanding of the content of the database

Production of reports in the GRDC Report Series for example on global/regional hydrological issues, in the interest of projects/programmes of, inter alia, WMO, UNEP and UNESCO

The GRDC holds the right to change the extent and scope of standard services without notice

Examples of specialised services would be: detailed statistical analyses of regional time-series for specific studies; assessment reports; production of graphical displays; monitoring of global/regional runoff on a comparative basis; production of reports on special request; etc.

Annex 4
Cost of GRDC Services

1. Staff time is based on a per hour rate which in July 2002 was set at € 40,--. This includes all overheads and mail services.

2. To give an indication of the approximate costs of databank services, the following can serve as a guideline:

a) Simple queries, such as a search for all stations of three major rivers and the extraction of mean daily discharge data:
Estimated time for completion: 1.5 hours
Approximate cost (July 2002) : € 60,--

b) Complex queries, such as the selection of daily discharge time series of at least 20 years for 20 stations from three major rivers, with maximum overlap of time series:
Estimated time for completion: 5 hours
Approximate cost (July 2002) : € 200,--

3. For complex tasks where data products (statistical evaluations, graphics, etc.) are also requested, a cost estimate is made and agreed upon in advance.

4. Services for projects which require extensive work at the GRDC or the establishment of an own database are agreed upon in a Memorandum of Understanding (MoU) between the project partners. In these cases, the financial contribution for the services of the GRDC are prized and incorporated in the MoU.

5. Payment for services is by bank transfer to the credit of the GRDC:
BUNDESKASSE TRIER, DEUTSCHE BUNDESBANK, FILIALE TRIER
SWIFT CODE: **ZBRS DE 51585**, BLZ: **585 000 00**, ACCOUNT: **585 010 05**,
CREDIT: **03007997 / GRDC**

Cheques sent by registered mail and made payable to "GRDC" are also acceptable.

Annex 9 Information note on GRDC station selection criteria, data format and data transfer

I. Which information the GRDC is interested in?

The GRDC aims to maintain an up-to-date collection of world-wide data on discharge that comprehensively represents the runoff situation at a global scale. However, given the many conceivable scientific questions and applications of such data, it is not easy to define unambiguous, crisp criteria for what should go into the database and what should stay outside. On the contrary, some criteria may even be contradictory which results from different potential uses. For illustration imagine e.g. the following three examples:

- Trend analysis for climate change which relies on long-term records of preferably undisturbed catchments, which usually implies small catchments.
- On the other hand, the estimation of the annual freshwater flux into the oceans in the first place requires information of the large streams.
- Forecasting tasks require up-to-date, so-called Near-Real-Time (NRT) information.

In section III of this note we therefore list criteria, which should be regarded as guidelines rather than as strict rules. We consequently ask for the provision of data which meet a few of the criteria stated there, but not necessarily all, as such stations are hardly available.

II. Metadata

Apart from the actual data, in any case the GRDC appreciates to be provided with a complete METADATA list of ALL gauging stations in a country or region as to be able to oversee and analyse the situation itself. Furthermore, on request the GRDC could thus serve the data provider as a free-of-charge advertiser and directory for his data, e.g. by putting the metadata table on the GRDC-homepage and linking to the provider.
A metadata table features row-wise all interesting information about the stations, ideally providing information under the following column heads (of which the 5 most important ones are marked by **):

(1) Basic Station Information

- station no
- station name **
- river name **
- basin name
- country name
- latitude **
- longitude **
- altitude
- catchment size **
- daily data available from
- daily data available until
- percentage of missing values (daily data)
- monthly data available from
- monthly data available until
- percentage of missing values (monthly data)
- mean annual streamflow

For those stations whose data series' are delivered to the GRDC we ask to be provided with a few further metadata entries:

- main stream or main basin name
- date when measurement started (YYYY-MM-DD)
- date when measurement stopped (YYYY-MM-DD)
- name or ID of succeeding station
- date of station reactivation (YYYY-MM-DD)
- information on method of measurement
- information on data quality check
- additional parameters measured?
    - water level (y/n)
    - water temperature (y/n)
    - sediments (y/n)
    - water quality parameters (y/n)

(2) Information about the Data Supplier: To establish a closer collaboration and to give feedback about the data use the GRDC needs to know your co-ordinates. (This information is only needed once per consignment!)

- The full postal address of the organisation handling and delivering the data **
- The name and email address of a focal point in your country **

III. Guiding criteria

The guiding criteria for the selection of a station for provision to the GRDC (only a few are sufficient to select a station) are:

- stations at rivers which best reflect the hydrological regime of a region or part of a country
- stations at rivers which are economically important in terms of population density and/or agro-based or industrial production
- last downstream stations at rivers which drain into the oceans or have an internal drainage
- stations with annual average discharge
    - greater than around 100 cbm/s
    - among the 10-50 highest in a region or country
- stations with basin sizes
    - greater than around 25.000 sqkm, if next station to the sea
    - greater than around 50.000 - 100.000 sqkm
    - among the 10-50 largest in a region or country
- stations at rivers where the basin population is greater than 1.000.000 inhabitants
- stations of rivers in pristine basin (often very small ones)
- stations with long records, i.e. longer than 30-40 years, ideally covering the WMO periods 1931-60 and 1961-90.
- stations with up-to-date information (1990-now)
- stations which provide Near-Real-Time (NRT) access to current data, preferably via internet

IV. Method of data transfer

The favourable way of transferring data to the GRDC is email. Please note: When sending us the data by email there is a limitation of size (5 MB) for attachments in our institute. When the file size exceeds this limitation it will be possible to use FTP instead. Of course CDs, diskettes or even printed media sent by postal mail are welcome, too.

V. GRDC's preferred data file format

Below we describe our preferred data and file format that will facilitate our data processing largely. However, if there are problems in generating this format, the GRDC accepts different formats, too. In this case, of course, we need a comprehensive file description.

Preferred File Format
- The file should be delivered in standard text (DOS ASCII) or MS-Excel format (*.xls).
- It is recommended to use spaces instead of tabs as column separator.
- Ideally there should be one file per station for either daily and for monthly data.
- The discharge values should be given in cbm/s.

Preferred Data Format
- Line 1: International river name in uppercase letters.
- Line 2: Station name in uppercase letters
- Line 3 to end: YYYY-MM-DD, Value (10 digits)

- Missing discharge values should be marked as –999.000.
- For monthly values please use 00 for DD.
- For daily data, please expand each month to 31 days using –10.000 or –999.000 as non-available value.

Example for a daily data file:

```
CONGO
BRAZZAVILLE
1978-01-01  1860.000
1978-01-02  1865.000
1978-01-03  –999.000
:
1978-02-30  -10.000
:
```