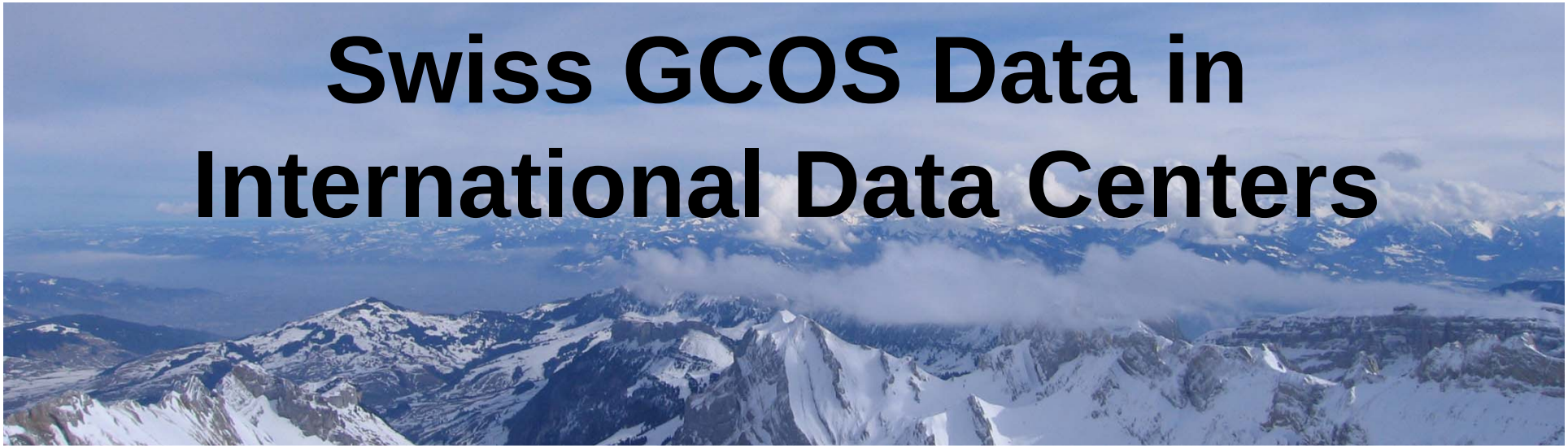
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Home Affairs FDHA
Federal Office of Meteorology and Climatology MeteoSwiss

Swiss GCOS Data in International Data Centers



***Gabriela Seiz**, Fabio Fontana, Sebastian Koenig, Andrea van der Elst*

Head of International Affairs Division, Swiss GCOS Office
Federal Office of Meteorology and Climatology MeteoSwiss
www.gcos.ch ¦ gcos@meteoswiss.ch

Outline

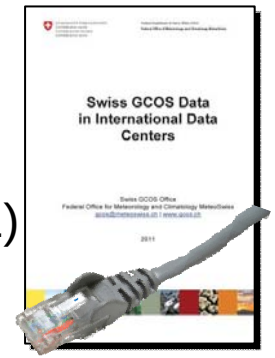
- Swiss GCOS Office
- Swiss GCOS Data in International Data Centers
- GCOS Cooperation Mechanism: Project CATCOS
- Conclusions and Outlook

Swiss GCOS Office

- **National Coordination** of climate relevant measurements from Federal Offices, Research Institutes and Universities
  → National GCOS roundtable (annually)
  → Reports, Brochure, Webpage, Movie
    → available at: www.gcos.ch

- **Inventory Report** (Seiz and Foppa, 2007)
  National Climate Observing System (GCOS Switzerland)
  - Atmospheric Domain (Surface, Upper Air, Composition)
  - Terrestrial Domain (Hydrosphere ,Cryosphere, Biosphere)
  - International Centers
  - Observations outside Switzerland

  - **International Data Center Report** (MeteoSwiss, 2011)
  - Swiss GCOS Data in International Data Centers



International Data Center Report

Motivation

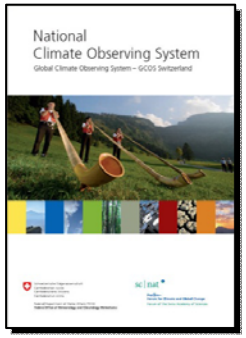
*"… ensure **regular and timely submission** of climate data to **International Data Centres for all ECVs**…"*
[Key Need 10, GCOS IP-10 (GCOS-138), p.9]

*"… **flow of data to the user community and to the IDCs is inadequate for many ECVs**, especially for those of the **terrestrial observing networks**…"*
[GCOS IP-10 (GCOS-138), p.9]

→ Kick off: Swiss GCOS Roundtable 2010 with emphasis on "Swiss GCOS data in International Data Centers"

International Data Center Report

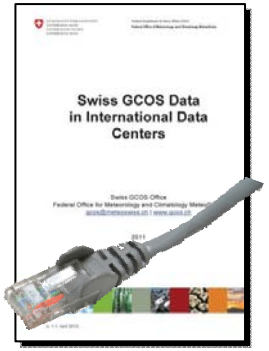
- **Approach**
  - Outline according to existing Inventory Report
  - Review by Swiss GCOS Partner Institutions
  - One table for each ECV



- **Publication**
  - First online publication in 2011:

www.gcos.ch > Publications > Reports

  - Periodical update by Swiss GCOS Office with input from Partner Institutions



→ Swiss GCOS Office: Coordination and improvement of data chains for Swiss GCOS data

International Data Center Report

[ECV]

Sub parameter	Specific sub-parameter of ECV ?
Network(s)	Relevant GCOS network ?
Stations	Swiss stations designated for this network ?
Data centers	Official international data center (DC) ? Are there several ?
Responsible institution for data submission	Who is responsible for data submission ?
Data submission	How are the data submitted (resolution, means of submission) ?
Data format	In what format are data available at DC ?
Data access	How to get data ?
Data quality	Who monitors data quality and how ?
Online Performance monitoring	Who monitors data availability and how ?
Publications	What pubications are issued by the DC, and how often ?
User statistics	Who uses the data ? How many downloads, etc. ?
Contact	Who is the contact, at the DC, in Switzerland ?
Notes	…

poor

medium

good

‚Traffic lights' to assess completeness / quality of information

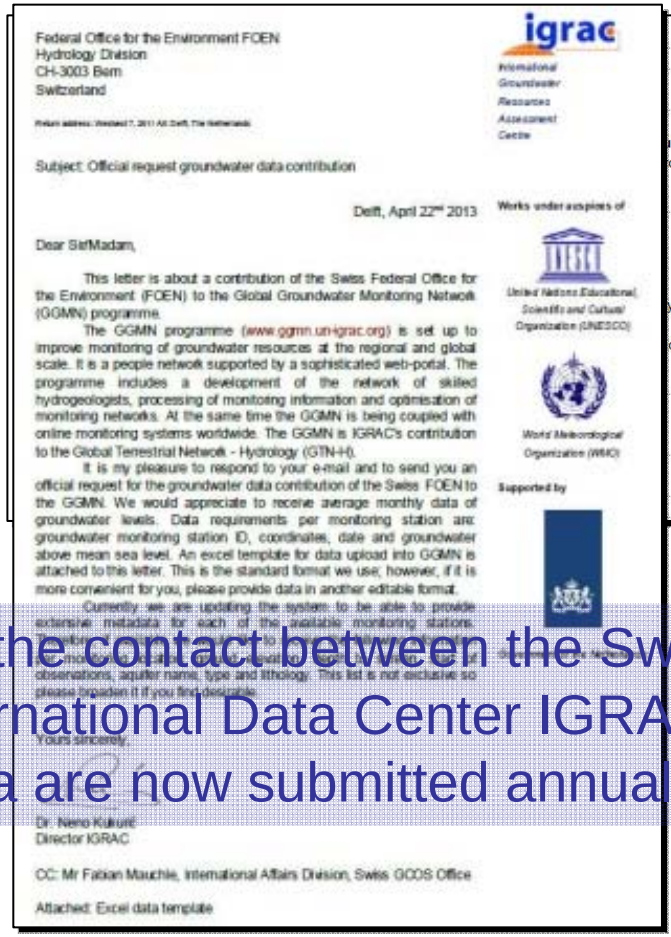
Example I: Groundwater

2012

3.1.3 Groundwater

Sub parameters	Groundwater level, groundwater recharge and discharge, well groundwater level and water quality
Network(s)	**Global Terrestrial Network – Groundwater (GTN-GW, under GTN-H)** **NAQUA**
Stations	**GTN-GW** Swiss stations are not apparent **National Groundwater Observation NAQUA, Module QUANT (Groundwater quality)** as part of the Federal Office for the Environment (FOEN) (59 monitoring stations from the federal government, 30 monitoring stations from the cantonal government) Additional 400 cantonal stations for level and spring discharge observations.
Data centers	Water Information System for Europe (**WISE**) of the European Environment Agency EEA http://www.eea.europa.eu/themes/water/dc The data of 50 NAQUA monitoring stations are submitted to the EEA annually, although the EEA is not an official international GCOS data center. **International Groundwater Resources Assessment Centre (IGRAC)** WMO / UNESCO http://www.igrac.net/
Responsible institution for data submission	Swiss Federal Office for the Environment (FOEN), Hydrology Division
Data submission	E-mail
Data format	ASCII

2013



Federal Office for the Environment FOEN
Hydrology Division
CH-3003 Bern
Switzerland

igrac
International Groundwater Resources Assessment Centre

Subject: Official request groundwater data contribution

Delft, April 22nd 2013

Works under auspices of

United Nations Educational, Scientific and Cultural Organization (UNESCO)

World Meteorological Organization (WMO)

Supported by

Dear Sir/Madam,

This letter is about a contribution of the Swiss Federal Office for the Environment (FOEN) to the Global Groundwater Monitoring Network (GGMN) programme.

The GGMN programme (www.ggmn.un-igrac.org) is set up to improve monitoring of groundwater resources at the regional and global scale. It is a people network supported by a sophisticated web-portal. The programme includes a development of the network of skilled hydrogeologists, processing of monitoring information and optimisation of monitoring networks. At the same time the GGMN is being coupled with online monitoring systems worldwide. The GGMN is IGRAC's contribution to the Global Terrestrial Network - Hydrology (GTN-H).

It is my pleasure to respond to your e-mail and to send you an official request for the groundwater data contribution of the Swiss FOEN to the GGMN. We would appreciate to receive average monthly data of groundwater levels. Data requirements per monitoring station are: groundwater monitoring station ID, coordinates, date and groundwater above mean sea level. An excel template for data upload into GGMN is attached to this letter. This is the standard format we use; however, if it is more convenient for you, please provide data in another editable format.

Currently we are updating the system to be able to provide extensive metadata for each of the available monitoring stations. [illegible] observations, aquifer name, type and lithology. This list is not exclusive so please broaden it if you find desirable.

Yours sincerely,

Dr. Neno Kukuric
Director IGRAC

CC: Mr Fabian Mauchle, International Affairs Division, Swiss GCOS Office

Attached: Excel data template

→ Swiss GCOS Office facilitated the contact between the Swiss Partner Institution and the International Data Center IGRAC (quality-controlled monthly data are now submitted annually)

Example II: Greenhouse Gases, Glaciers

Greenhouse Gases ✓

Sub parameters	CH_4, CFCs, HCFCs, HFCs, PFCs, N_2O, SF_6
Network(s)	**WMO/GAW Global Greenhouse Gas Observation Network** **AGAGE/SOGE/NIES**
Stations	Jungfraujoch
Data centers	**WDCGG** See chapter 2.3.2 **AGAGE Data Base** Georgia Institute of Technology, Atlanta, Georgia, US http://agage.eas.gatech.edu/data_archive/
Responsible institution for data	Swiss Federal Laboratories for Materials Science and Technology (Empa) (with financial support of FOEN)
	AGAGE/SOGE/NIES Two years after the monitoring, the dataset is freely available via FTP
Data quality	**WDCGG** See chapter 2.3.2 **AGAGE** has earned an outstanding reputation among the research community. Statements on data quality can be found in the literature.
Online Performance Monitoring	**WDCGG** See chapter 2.3.2 **AGAGE** The performance of the monitoring network is discussed in regular meetings.
Publications	**WDCGG** See chapter 2.3.2 **AGAGE** literature, list available at http://agage.eas.gatech.edu/data_archive/agage/Publications.pdf
User statistics	Not evident
Contact	**WDCGG** See chapter 2.3.2 **AGAGE** Ronald G. Prinn (rprinn@mit.edu) **AGAGE Archive** Hsiang J. (Ray) Wang (raywang@eas.gatech.edu) **Empa** Stefan Reimann (Stefan.reimann@empa.ch), Martin Vollmer (martin.vollmer@empa.ch)
Notes	Alternative access via GAWSIS.

Glaciers ✓

Sub parameters	Inventory (area, length, elevation at a time) & fluctuations (changes in length, area, volume, mass, and flow velocity (only in Switzerland))
Network(s)	**GCOS/GTOS Baseline Global Terrestrial Network for Glaciers** (GTN-G)
Stations	http://www.wgms.ch/fog/fog9.pdf. **WGI-inventory** Assessment of total glaciation; detailed information for approx. 100'000 glaciers (Switzerland: all 2057 for 1973) **GLIMS-inventory** Digital glacier outlines for approx. 93'000 glaciers (Switzerland: 1124 for 1998/99) **Length change** Approximately 1800 glaciers in total, at the moment determined for approx. 700 glaciers (Switzerland: currently approx. 110) **Mass balance** Approximately 250 glaciers in total, at the moment determined for approx. 110 glaciers (Switzerland: currently 8)
Data centers	**World Glacier Monitoring Service (WGMS)** Dept. of Geography, University of Zurich, Switzerland http://www.wgms.ch CIRES, University of Colorado, Boulder (CO), US http://nsidc.org/data/glacier_photo/index.html **Swiss Glacier Monitoring Network (GLAMOS)** VAW, ETH Zurich, Switzerland http://glaciology.ethz.ch/swiss-glaciers/
Responsible institution for data submission	**NSIDC** WGI inventories **GLIMS** GLIMS inventories **WGMS** via **GLAMOS** Fluctuations, through National Correspondent
Data submission	**WGMS** Active, annual „calls for data" via National Correspondents; format defined by WGMS **NSIDC** Passive, on request **GLIMS** Passive, on request **GLAMOS** Active, annual calls
Data format	**WGMS**, **NSIDC** XLS, ASCII **GLIMS** Different formats available (ESRI, MapInfo, GML, KML, GMT) **GLAMOS** XLS, ASCII, XML, KML
Data access	**WGMS** Access to data for most of the glaciers until 2009, order by e-mail. **NSIDC** http://nsidc.org/data/glacier_inventory/browse.html (direct access) **GLIMS** Direct access via search mask, for Switzerland 1124 records were found → www.gtn-g.org as „one-stop-portal" for WGMS, NSIDC and GLIMS **GLAMOS** Instant access to data for every Swiss glacier http://glaciology.ethz.ch/swiss-

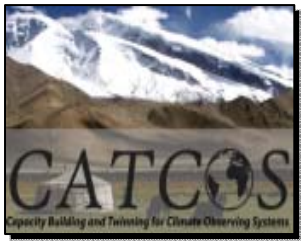
"A high priority should be given to additional observations in **data-poor regions and regions sensitive to change**."
[GCOS Monitoring Principles #7, 2003]

From National to Global Monitoring

- **GCOS Cooperation Mechanism**
  established in 2002 (UNFCCC Decision 5/CP.5)

- **Reactivation of GUAN stations**
  - Dar es Salaam (Tanzania), Harare (Zimbabwe), Khartoum (Sudan)

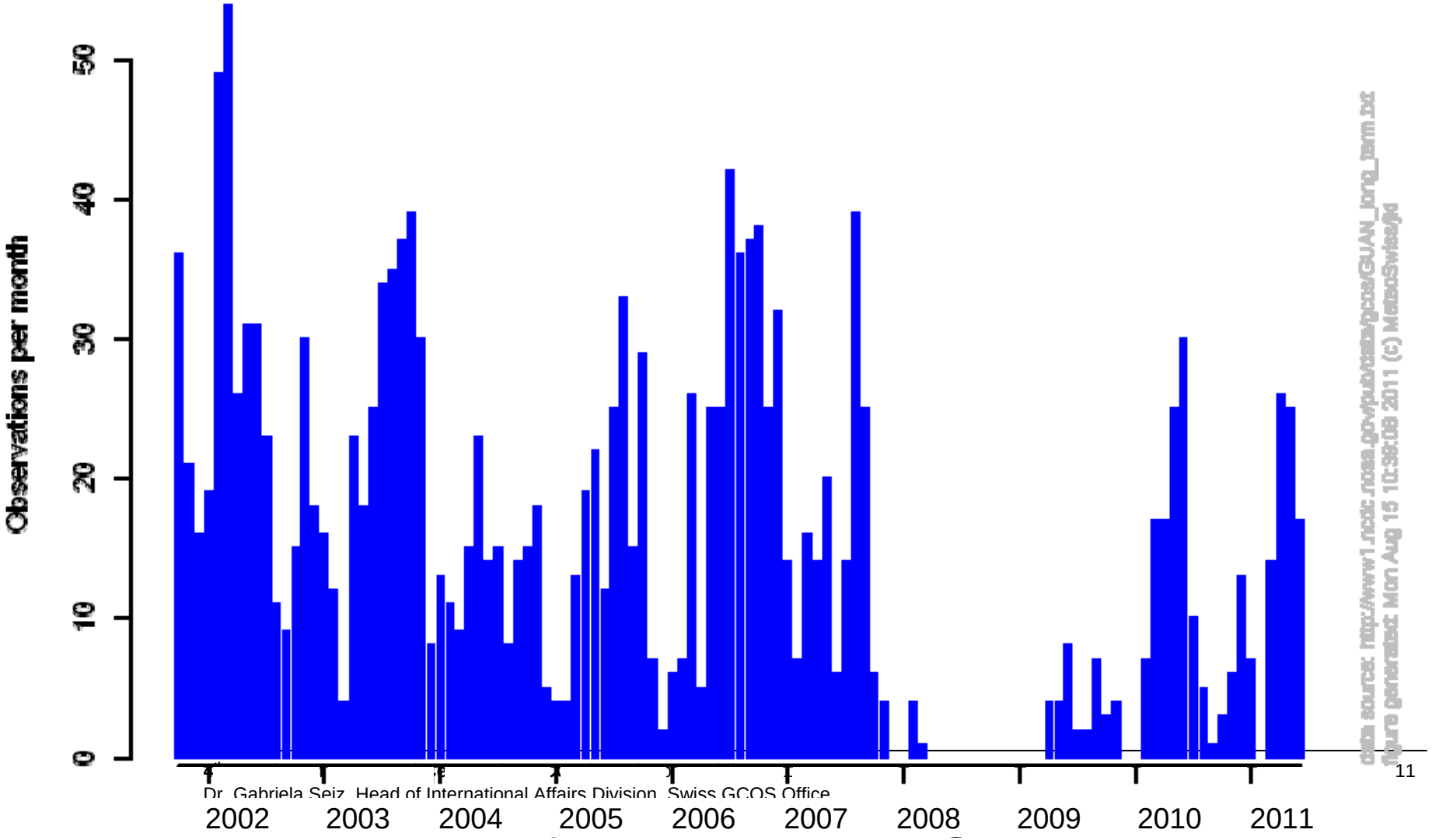
- **Project CATCOS**
  - Improvement of Climate Observing Systems in 7 countries



→ Establish or resume important long-term measurement series of ECVs and their data submission to International Data Centers

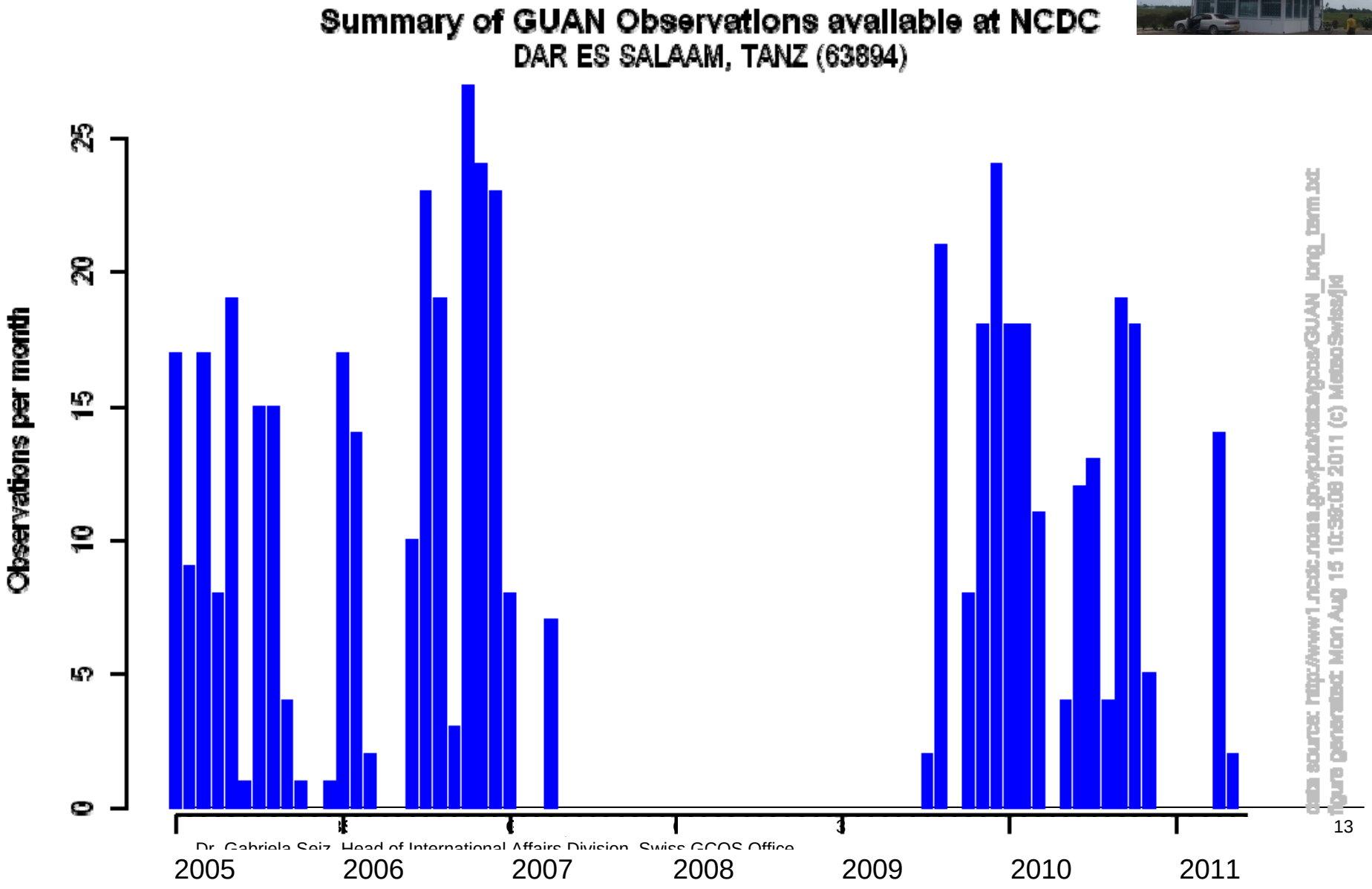
GUAN stations Africa: Harare

GUAN stations Africa: Harare



GUAN stations Africa: Dar es Salaam

GUAN station: Dar es Salaam



Project CATCOS: Overview

CATCOS

Capacity Building and Twinning for Climate Observing Systems

→ **www.gcos.ch > GCOS Cooperation Mechanism > CATCOS**

- **Coordination:** MeteoSwiss
- **Implementation Partners:** Empa, PSI, Univ. Zurich, Univ. Fribourg
- **Duration:** Sep 2011 – Mar 2014
- **Budget:** 2.3 Mio CHF
- Financed by **Swiss Agency for Development and Cooperation (SDC)**

Project CATCOS: Outcomes

- **Outcome 1 – Atmospheric Domain**
  Increase public availability and quality of observations of **aerosols and greenhouse gases**

- **Outcome 2 – Terrestrial Domain**
  Increase public availability and quality of **glacier monitoring** data

- **Outcome 3 – Cross-Cutting**
  Increase the capacity in **each of these countries** to produce, manage and analyze climate data

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Home Affairs FDHA
Federal Office of Meteorology and Climatology MeteoSwiss

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

EMPA

PAUL SCHERRER INSTITUT
PSI

Atmospheric Domain

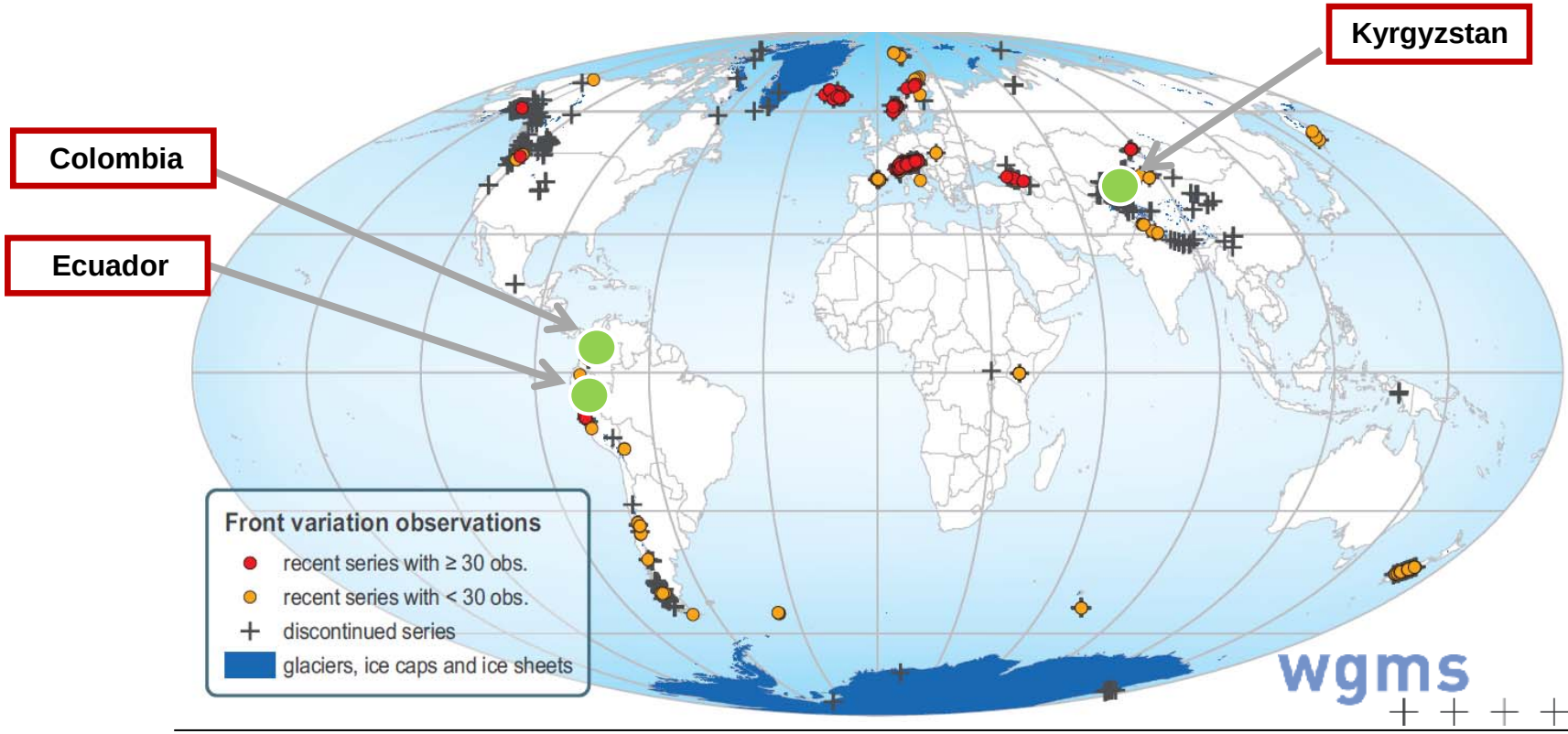
Universität Zürich[UZH]

UNIVERSITÉ DE FRIBOURG SUISSE
UNIVERSITÄT FREIBURG SCHWEIZ

Terrestrial Domain

International Contribution – Global Atmosphere Watch (GAW)

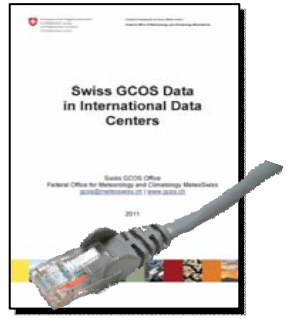
International Contribution – World Glacier Monitoring Service (WGMS)



Conclusions and Outlook

- Importance of well-established **national coordination** in as many countries as possible worldwide
  - 26 National GCOS Coordinators
  - ~130 National GCOS Focal Points

- Submission of national GCOS data to International Data Centers is essential
  → Dialogue between National GCOS Focal Points and International Data Centers



- International projects, eg. CATCOS, help to improve climate observing systems in developing and emerging countries
  → UNFCCC Fast-Start Finance

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Home Affairs FDHA
Federal Office of Meteorology and Climatology MeteoSwiss

Thank you for your attention!

Gabriela Seiz, Fabio Fontana, Sebastian Koenig, Andrea van der Elst

International Affairs Division, Swiss GCOS Office
Federal Office of Meteorology and Climatology MeteoSwiss
www.gcos.ch ¦ gcos@meteoswiss.ch