Agência Nacional de Águas
SGI – Superintendência de Gestão da Informação

THE HYDROLOGICAL MONITORING NETWORK SERVICES AND GAPS

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NATIONAL WATER AGENCY

- Created in July 2000
- Implement the National Politics of Water Resources
- Organize the National System of Water Resources Management

Department of Hydrological Information

- Main task: Support the National Hydrological Monitoring Network
- Develop the National Information System for Water Resources
Uses for the collected information

- A GOOD MONITORING NETWORK IS VITAL

Water Resources Management aims at multiple water uses
Earth Observation projects

- Basic Hydrological Network
  - Quantity
  - Water Quality

- Telemetric Network
  - Automatic stations

- Alternatives for monitoring
  - Cell phones
  - Regular phone line

Information Systems

- Hidro and the Hidroweb
- Real time telemetric system
- New National Information System for Water Resources
Basic Hydrological Network (operated by ANA)

Características:
969 monitored Rivers
Manual collect and analysis of data (analogical equipments)
4 measuring campaigns per year
This causes a delay of about 3 to 5 months for the information
Basic measurements

• Off Stream Stations
  – Rain
  – Continuous Rain
  – Evaporation

• On Stream Stations
  – Water level (manual and data loggers)
  – Liquid discharge (regular measurement and ADCP)
  – Water quality
  – Sedimentometry
Big Numbers

- 2601 monitoring points
- 151 operation routes
- 1,620,000 km (approx 1,000,000 miles) – that corresponds to 44 turns around the Globe
- 320 airplane hours
- 16,300 boat hours
- 26 operations bases
- 3,600 involved people
Hidro Database

- All the information collected through the Basic Monitoring Network is available on the Internet (hidroweb.ana.gov.br)
Hidro Database

- Downloadable program for the management of hydrological information (Hidro 1.09)
  - Stations Inventory
  - Static data - Rivers/Basins/Cities/States/…
  - Historical Series
    - Water Level
    - Rain
    - Liquid Discharge Measurement
    - Generated Discharge
    - Water Level X Discharge – Curve
    - Water Quality
    - River Section
    - Sedimentometry
    - Climate data
  - Reports, graphics and other hydrological information
Basic Hydrological Monitoring Network Summary

ADVANTAGES

• Very dense network
• Long series of data (good for hydrological studies)
• Covers all the country

GAPS

• Big delay between the collecting and publishing of the data
• Huge amount of money and people involved
• Some stations in very difficult to reach location (Amazon Basin)
Telemetric Stations

- 313 installed stations
- Covering all the main river basins
- Rain gauge and pressure sensor (water level) at every station
- Data collected hourly
- Transmission using SCD and CBERS satellite (through INPE – National Institute for Spatial Research)
- System for alert and hydrological situation
Real Time Telemetric System

- Hidrological view
- Alert System
- Data analysis in real time (i.e. Detects sensor problems)
## Código | Estação          | Data e Hora | Último | 4h  | 8h  | 12h | 24h | 96h |
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**Total de registros encontrados:** 9

**TIPO DE INFORMAÇÃO**

- Chuva
- Nível
- Vazão

**SITUAÇÃO DO NÍVEL**

- Sem Informação Atualizada
- Sem dado de referência
- Abaixo da cota com permanência de 95%
- Nível normal (entre 5% e 95%)
- Acima da cota com permanência de 5%
- Acima da Cota de Alerta
Telemetric Monitoring Network Summary

ADVANTAGES

• Data collected hourly
• No need for human observers
• Almost realtime data available
• Support for the alert system

GAPS

• Acquiring and maintenance cost of automatic equipments
• Vandalism
• Difficult maintenance in distant areas (sometimes it takes months to change a defective equipment)
TWO ALTERNATIVES FOR MONITORING

CELL PHONES

• Low transmit cost
• Bi-directional
• Problem: no signal coverage in remote places (Amazon)

REGULAR PHONE LINE

• Low transmit cost
• No maintenance cost (public phone)
• Need for a human observer
Alert System for Water Quality

- Paraiba do Sul basin
- High demographic density - 3 most populated states (São Paulo, Rio de Janeiro and Minas Gerais)
- 10 monitoring points using portable water quality sensors (kit)
- Cell phone transmissions (very expensive to maintain automatic stations for water quality)
Em caso de ocorrência de anormalidades, alerta para a ANA e demais parceiros.
0800 Transmission (already tested)

- Regular phone line (toll free service)
- 2 information a day with no delay
- Low cost for received information

1- Bem vindo você ligou para o 0800 708 5055 da ANA, a Agência Nacional de Águas.

2- Digite seu Código de acesso.
Ex: | 1 | 2 | 3 | 4 | 5 | 6 |

3- Se você deseja informar uma nova “Cota” tecle 1 se não quiser digitar cota e quiser digitar a chuva tecle 2 e sega para cartilha PLU no item nº 10

4- Quando você quiser digitar uma cota negativa comece com: 
( * JOGO DA VELHA) para iniciar uma conta NEGATIVA
e o: ( * ASTERISCO) para finalizar.
The National Information System for Water Resources

- Improve the effectiveness of observations, centralizing the many monitoring networks around the country, from the Federal Government and the States
- (snirh.ana.gov.br)
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