Expanding the Mexican Global Historical Climatology Network (GHCN) and Operational Division Data Base in Mexico

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OVERVIEW

PROJECT GOALS:

- **Update and expand the temporal and spatial coverage of the GHCN data base of rainfall and temperature for Mexico.**

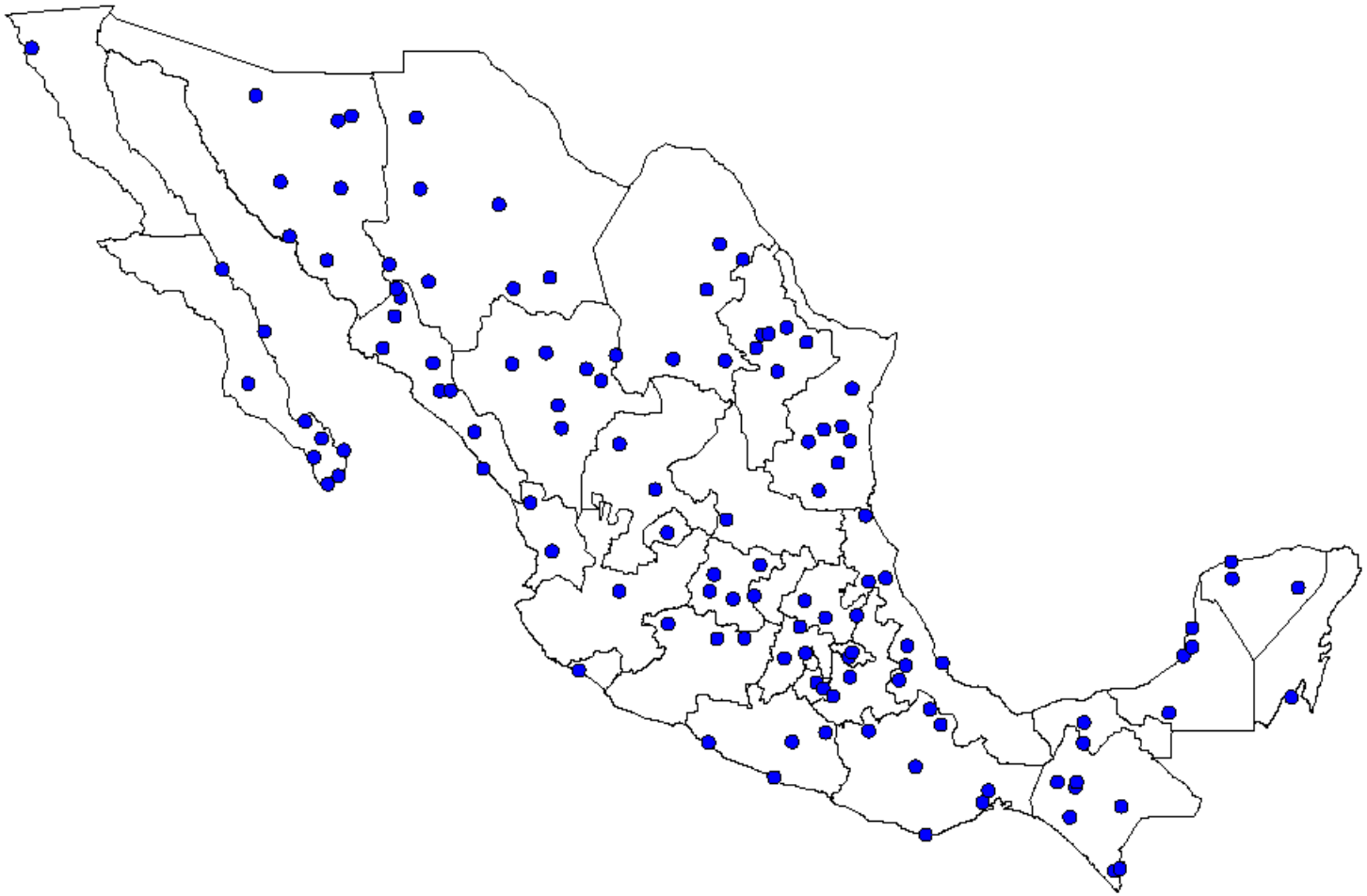
- **Define and implement a "near real-time" operational data base of monthly precipitation referenced to the climate division space scale.**

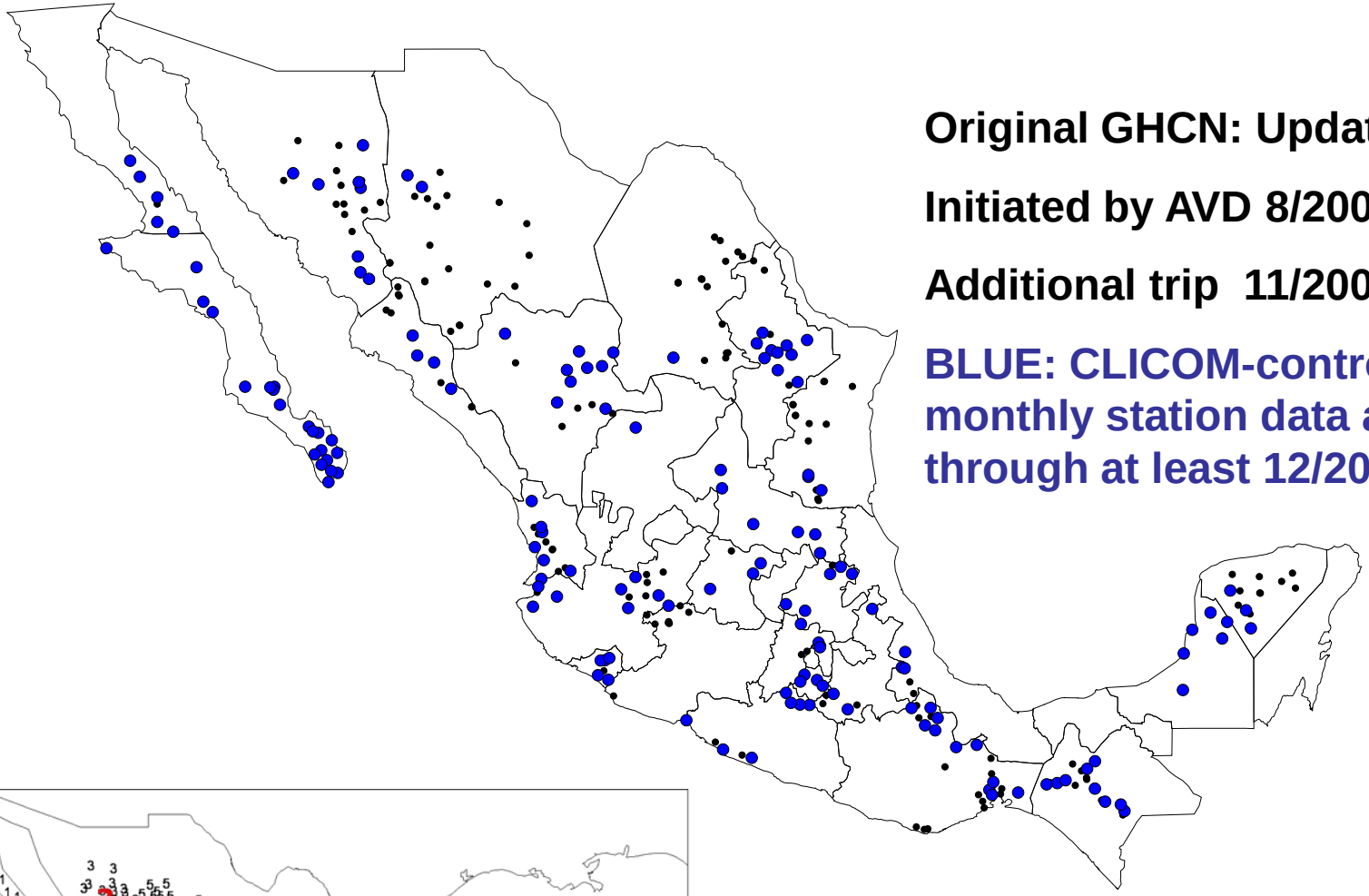
SOURCE DATA:

- **CLICOM: Mexican Meteorological Service (SMN) Archived surface climate observations (daily rainfall, max. and min. temperature) processed using WMO-compliant software**

GASIR: National Water Commission (CONAGUA) Daily operational climate observations (mainly precipitation) Surface Water Management and Engineering for Rivers

CURRENT NADM GRID: Derived by Merging CLICOM with Operational GASIR



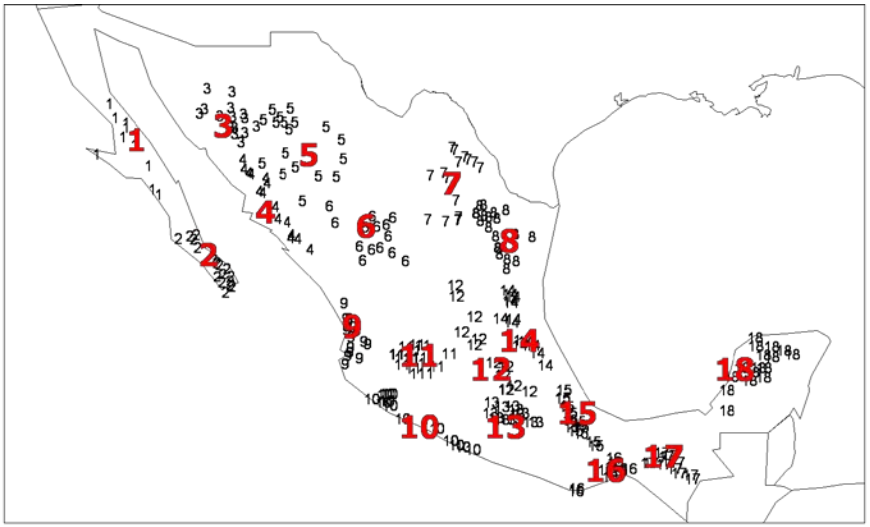


Original GHCN: Update Status

Initiated by AVD 8/2009

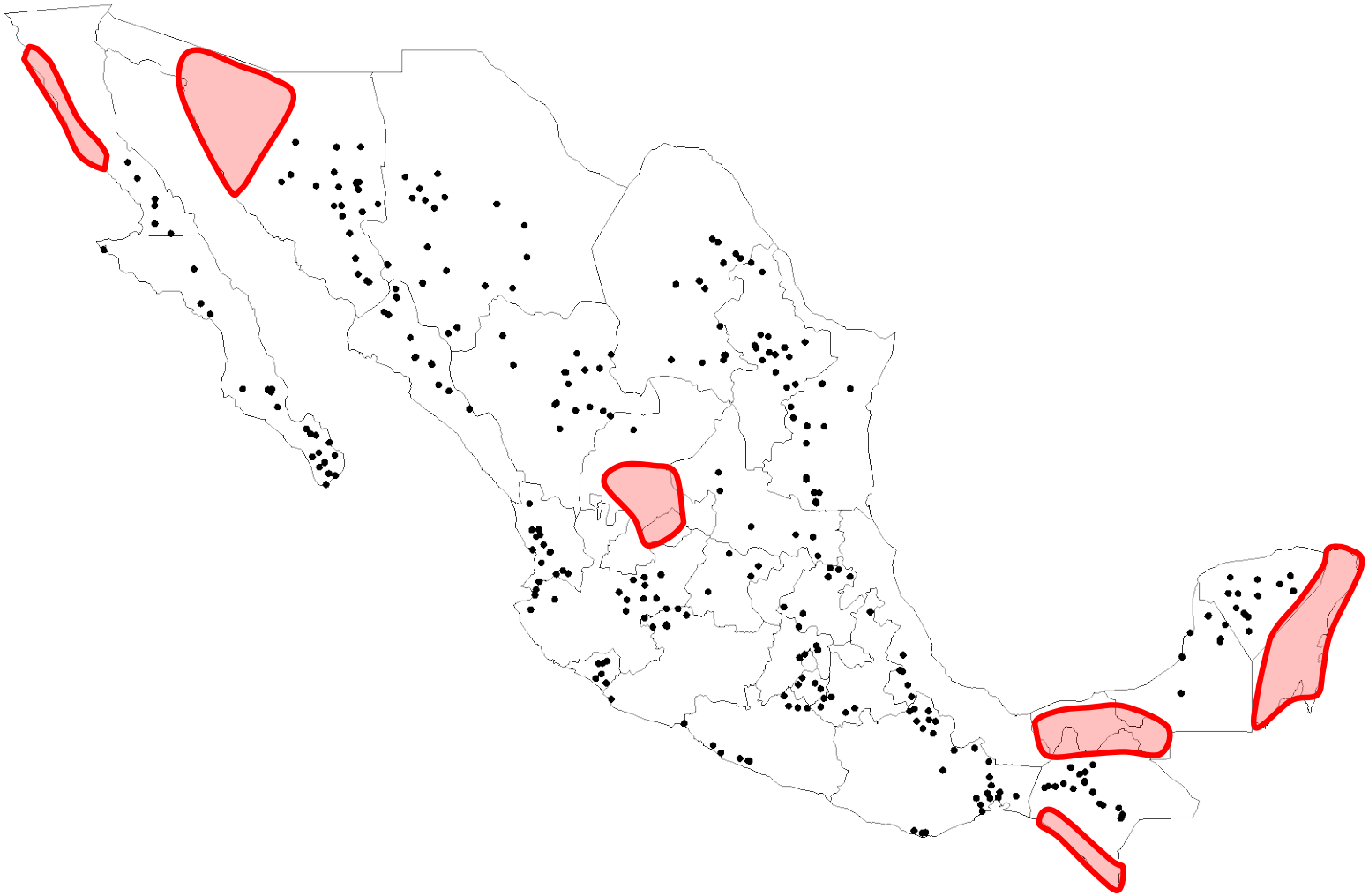
Additional trip 11/2009

BLUE: CLICOM-controlled monthly station data available through at least 12/2006.

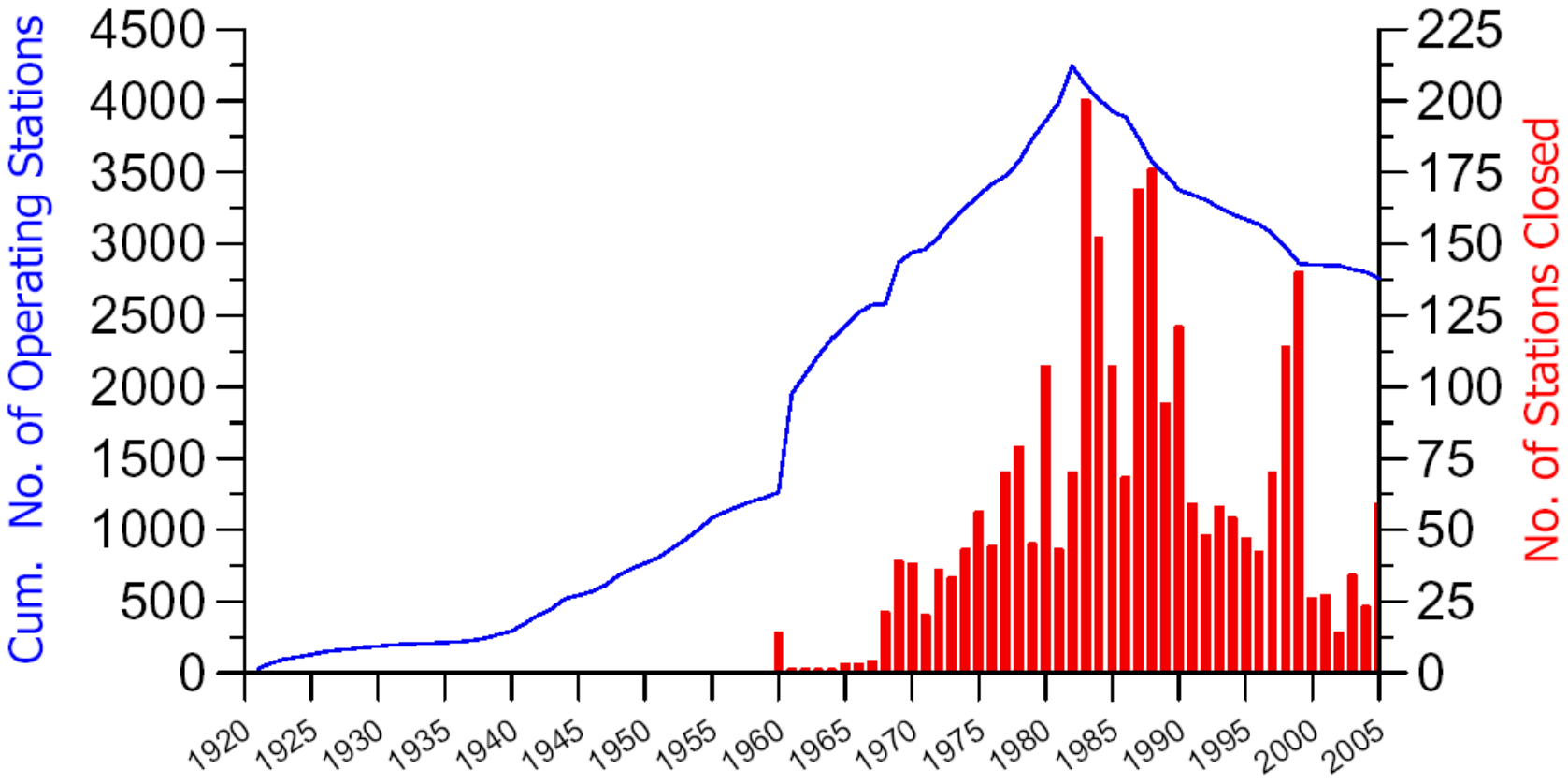


Original GHCN: Divisional Structure

APPROXIMATE LOCATIONS OF NEW DIVISIONS/STATIONS TO THE EXISTING GHCN



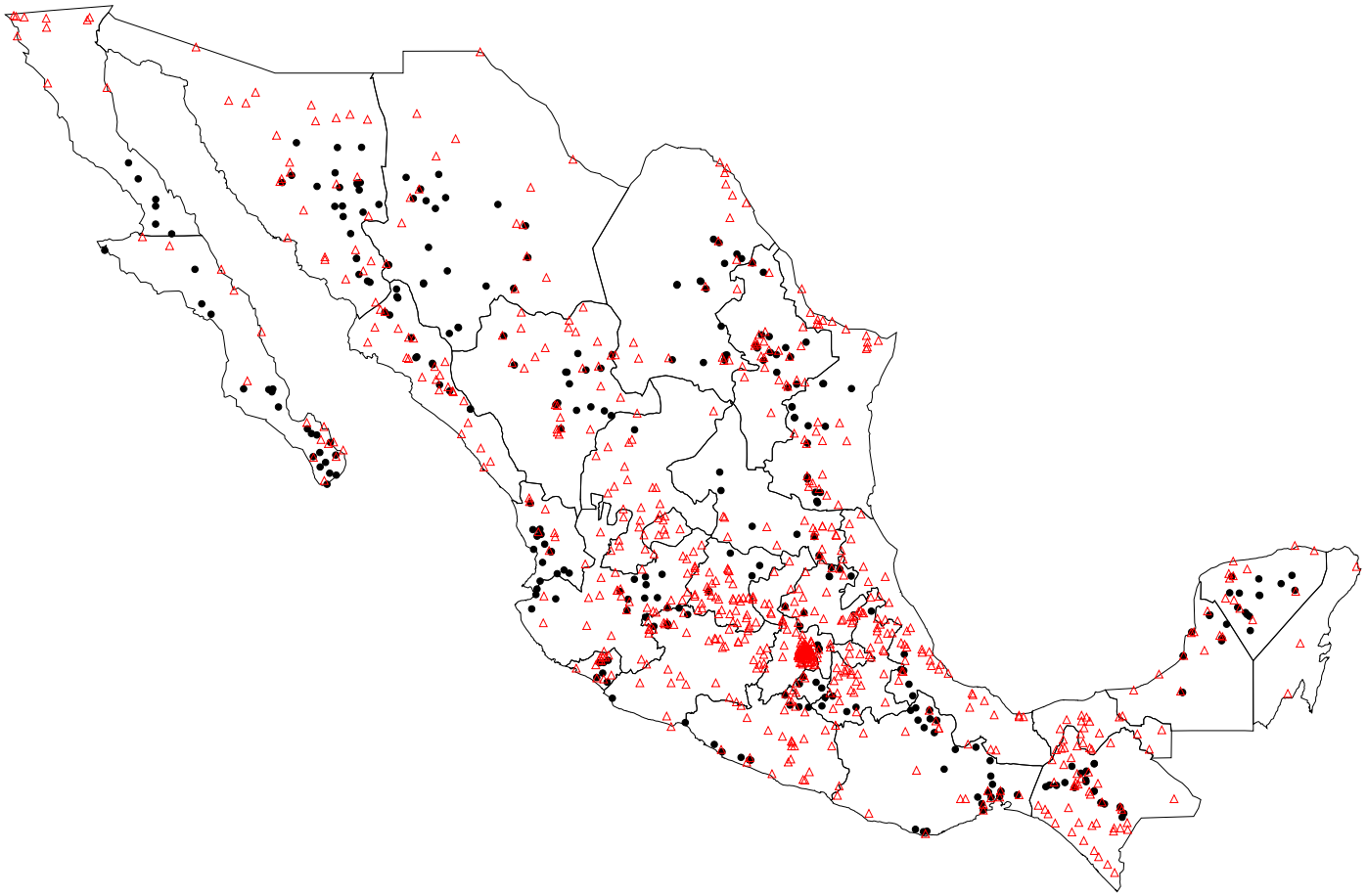
ANALYSIS OF SMN DIGITAL ARCHIVES: Operational vs. Suspended Stations



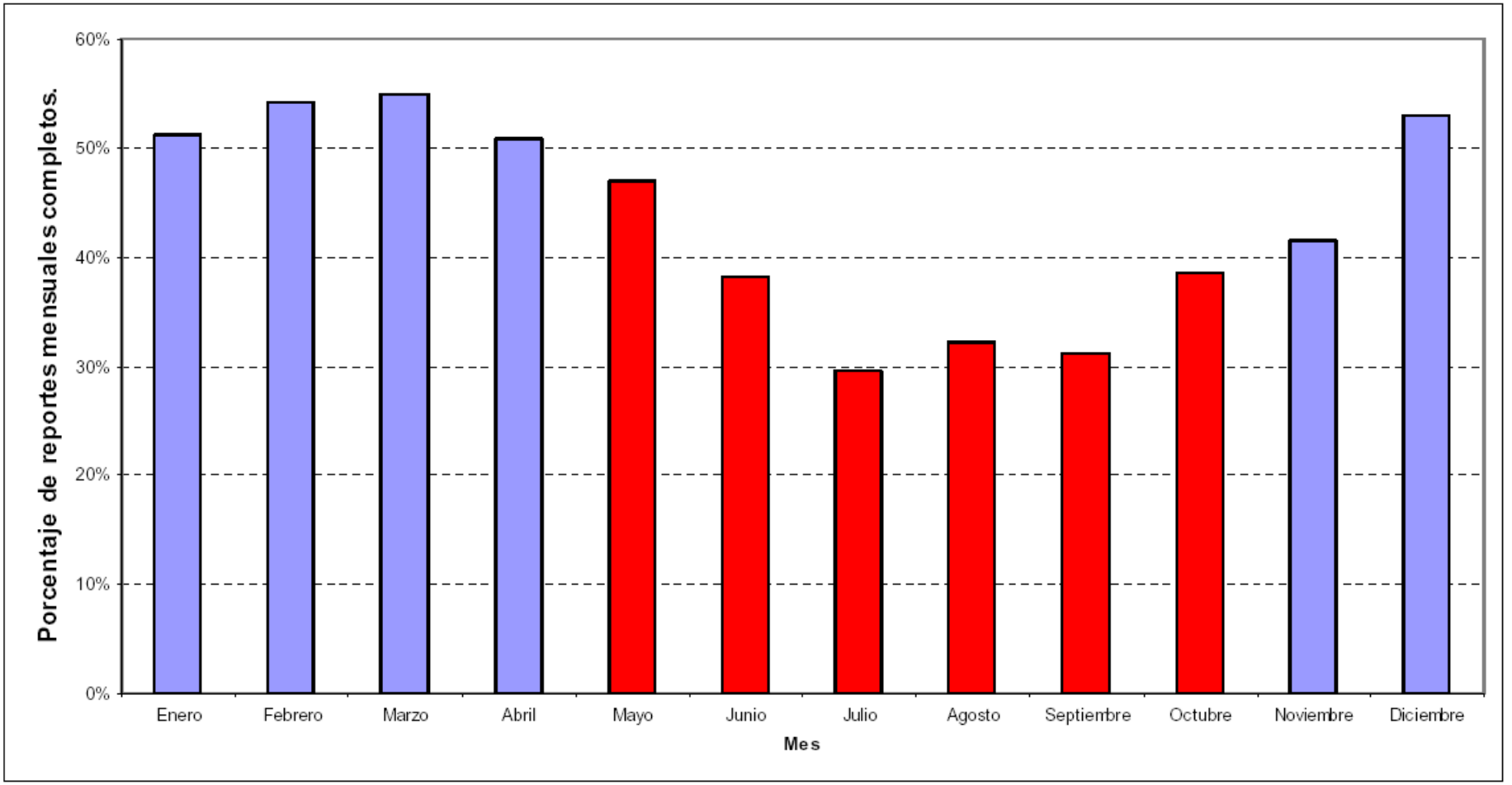
Long-term stations defined as operating pre-1965 with nominal operating period ≥ 40 years.

GASIR: CNA Surface Water Management and Engineering for Rivers

- Operational (mainly precipitation) observing/reporting network (late 1990s - present)



Analysis of Percentage of GASIR Stations with Complete Monthly Reports 1998-2005 (per Dra. Valentina Davydova)



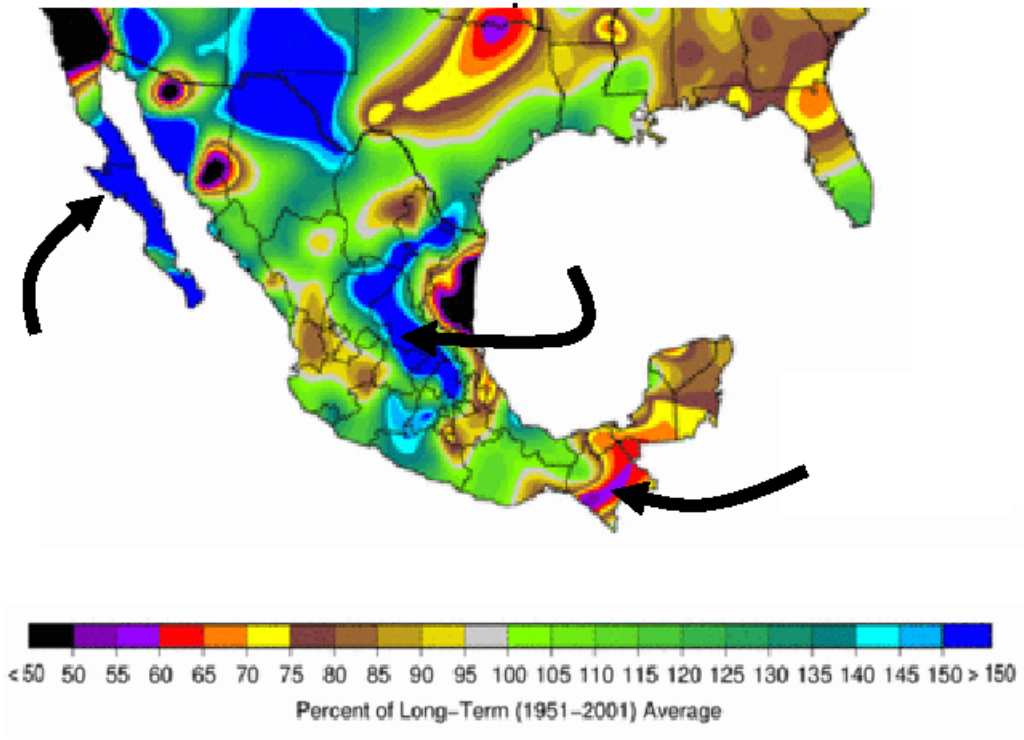
OPERATIONAL GOAL: A “near real-time” data base of monthly precipitation suitable for a range of operational seasonal forecasting, climate assessment and monitoring objectives.

- Construct with reference to the **new** spatially-averaged Divisional structure (i.e., 24 divisions)

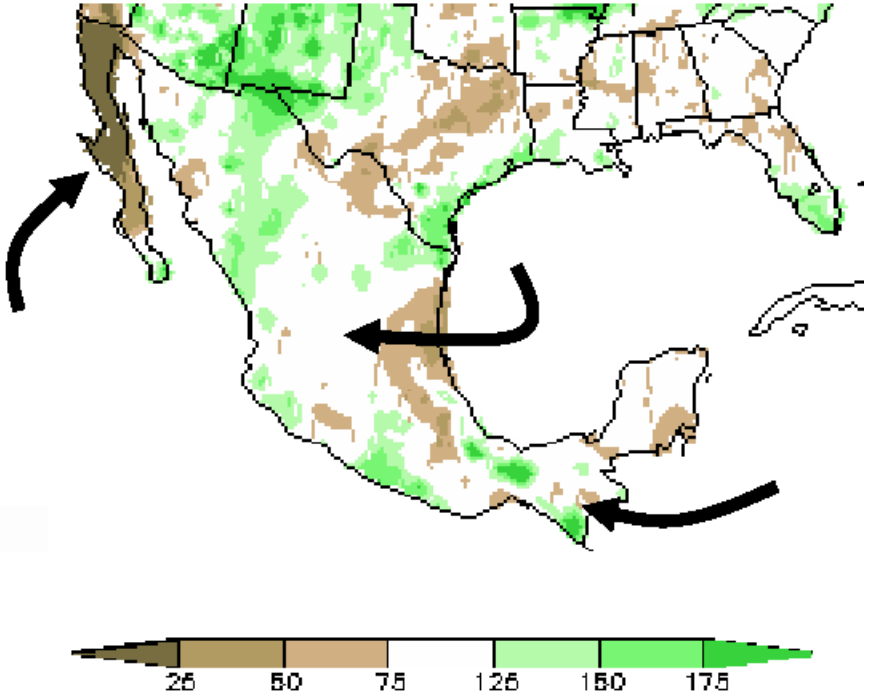
- Merge the **updated** GHCN (i.e., CLICOM) with selected GASIR reporting stations

Comparison of NADM and CPC Current Month Analyses

NADM (July - Sept 2006)
% normal rainfall

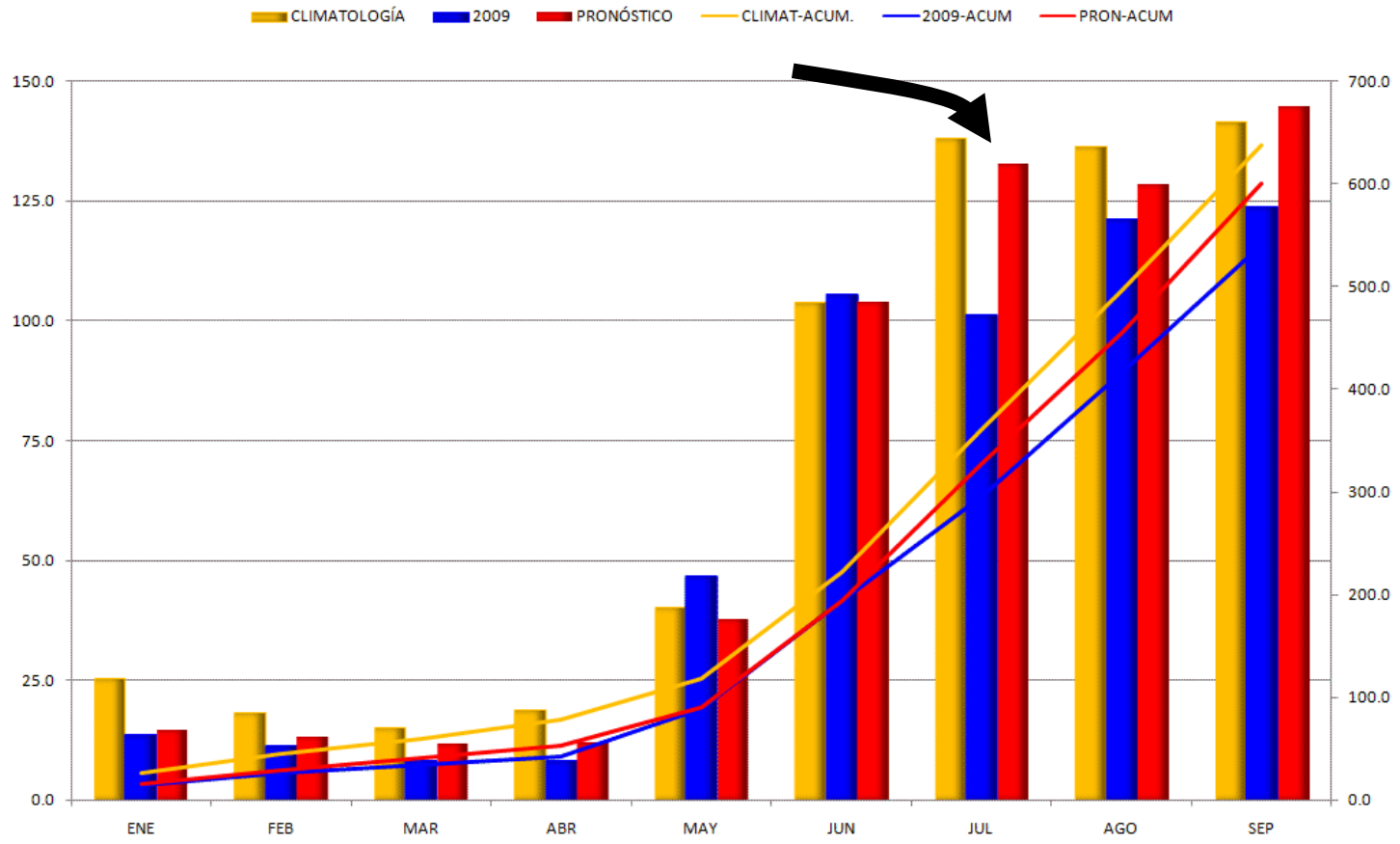


CPC (July – Sept 2006)
% normal rainfall



CONAGUA
Comisión Nacional del Agua

CLIMATOLOGÍA, PRECIPITACIÓN MENSUAL 2009 Y PRONÓSTICO CLIMATOLÓGICO



DATOS AL 25//09/2009

PRONÓSTICO EN BASE A LA ANALOGÍA DE LOS AÑOS 1957, 1997, 2002 y 2004

VALIDATION STRATEGY:

- Comparison of monthly divisional precipitation totals CLICOM-based vs. GASIR-based for “recent” overlapping data periods
- Tentative benchmark: ± 5% with no systematic bias
- Validation time period and benchmarks likely will be both division-dependent and seasonally-dependent

Example of Monthly Divisional Data Set Development from Daily GASIR Data

CAZANATE	SON	2001	8	4	0.00	0.00	0.00	17.50	0.00	0.00	0.00	0.00	0.01	0.00	4.00	5.00	0.00	53.20	0.01	41.50	2.00	
CHOIX, ESTACION	SIN	2001	8	4	0.00	0.00	0.01	18.00	0.00	27.00	0.00	17.50	0.00	0.00		2.70	0.00	12.80	12.80	37.50	12.50	
CULIACAN	SIN	2001	8	4	20.00	56.00	0.00			8.70	0.00	0.00	5.60	0.00	0.00	0.01	0.00	5.00	6.00	6.20	19.80	
EL FUERTE	SIN	2001	8	4	4.70	0.00	0.00	24.50	0.00	45.30	0.00	9.80	0.60	0.00	0.00	0.00	0.00	27.20	0.00	29.20	1.50	
PERICOS	SIN	2001	8	4	0.01	20.00	44.00	0.00	43.00	17.00	0.00		5.00	0.00	0.00	0.00		40.00	5.00	20.00	12.00	
PRESA SANALONA	SIN	2001	8	4	38.80	2.80	24.70	0.00	45.30	0.40	0.30	0.00	21.40	0.30	2.50	35.60	0.01	0.01	2.30	21.10	85.90	
SAN BERNARDO	SON	2001	8	4	0.00	0.01	3.50	25.90	0.00	0.00	0.01	0.01	0.00	14.70	0.00	0.00	0.00	21.30	1.01	31.50	0.01	
TESOCOMA	SON	2001	8	4	0.00	3.30	12.20	21.00	0.00	0.00	2.00	0.01	0.00	11.20	0.00	0.00	0.00	57.50	0.00	28.80	0.00	
		2001	8	4	7.94	10.26	10.55	15.27	12.61	12.30	0.29	3.90	4.08	3.28	0.93	5.41	0.00	27.13	3.39	26.98	16.71	**175.5**

A four year overlap period of GASIR and CLICOM indicates that on average, GASIR divisional monthly precipitation is within 5% of the official CLICOM divisional value.

DELIVERABLE	SCHEDULE
1) Updated Monthly GHCN station data for the existing 18 divisions	Nov-Dec 2009
2) Daily GHCN station for the existing 18 divisions (Precipitation, Max and Min Temp)	Spring 2010
3) Monthly and Daily data for NEW GHCN divisions	Early Fall 2010
4) Merged GHCN/GASIR monthly precipitation data	Winter 2011
5) Operational Monitoring/Assessment Products	Summer 2011

OPERATIONAL PRODUCTS:

Divisional-scale PDSI and SPI

Appropriate input for the NADM

Appropriate reference for monthly and seasonal rainfall forecasts

KEY COLLABORATING PERSONNEL:

Dr. Michel Rosengaus (SMN)
Ing. Javier Espinosa (SMN)
Ing. Alejandro Gonzalez (SMN)

NOAA POINTS OF CONTACT:

Jay Lawrimore (NCDC): GHCN update
Richard Heim (NCDC): NADM