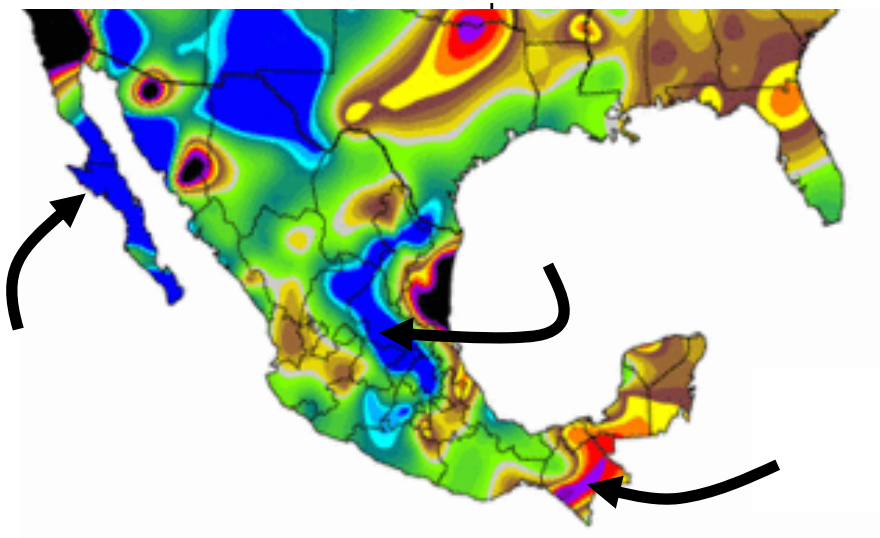
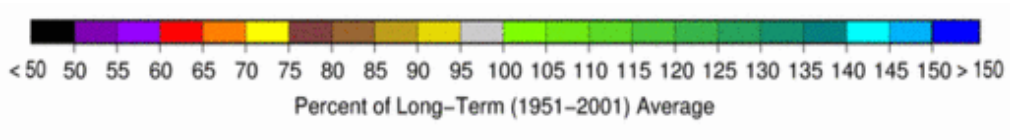
A Review of the Current NADM Grid in Mexico: Recommendations for Station Expansion Including Divisional Data Set Development for Long Term Climate Monitoring and Research

Art Douglas and Phil Englehart
Creighton University

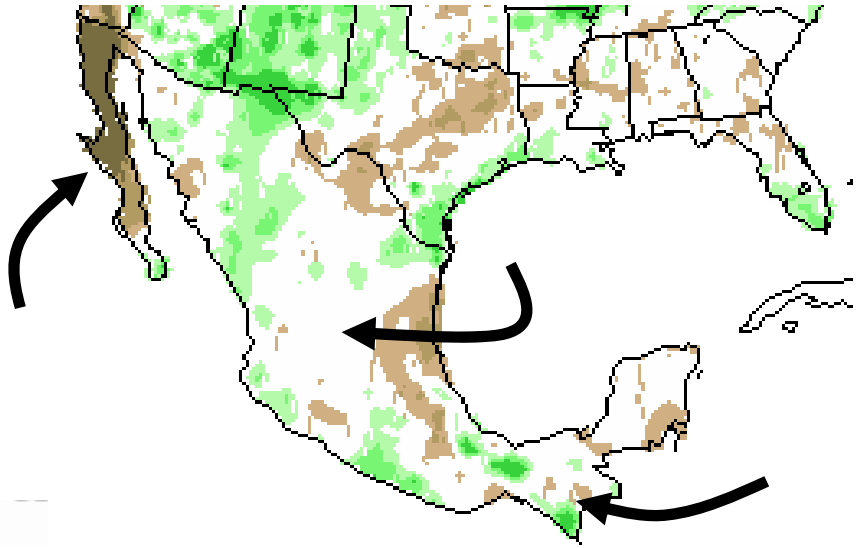
Comparison of NADM and CPC Current Month Analyses

NADM (July - Sept 2006)
% normal rainfall



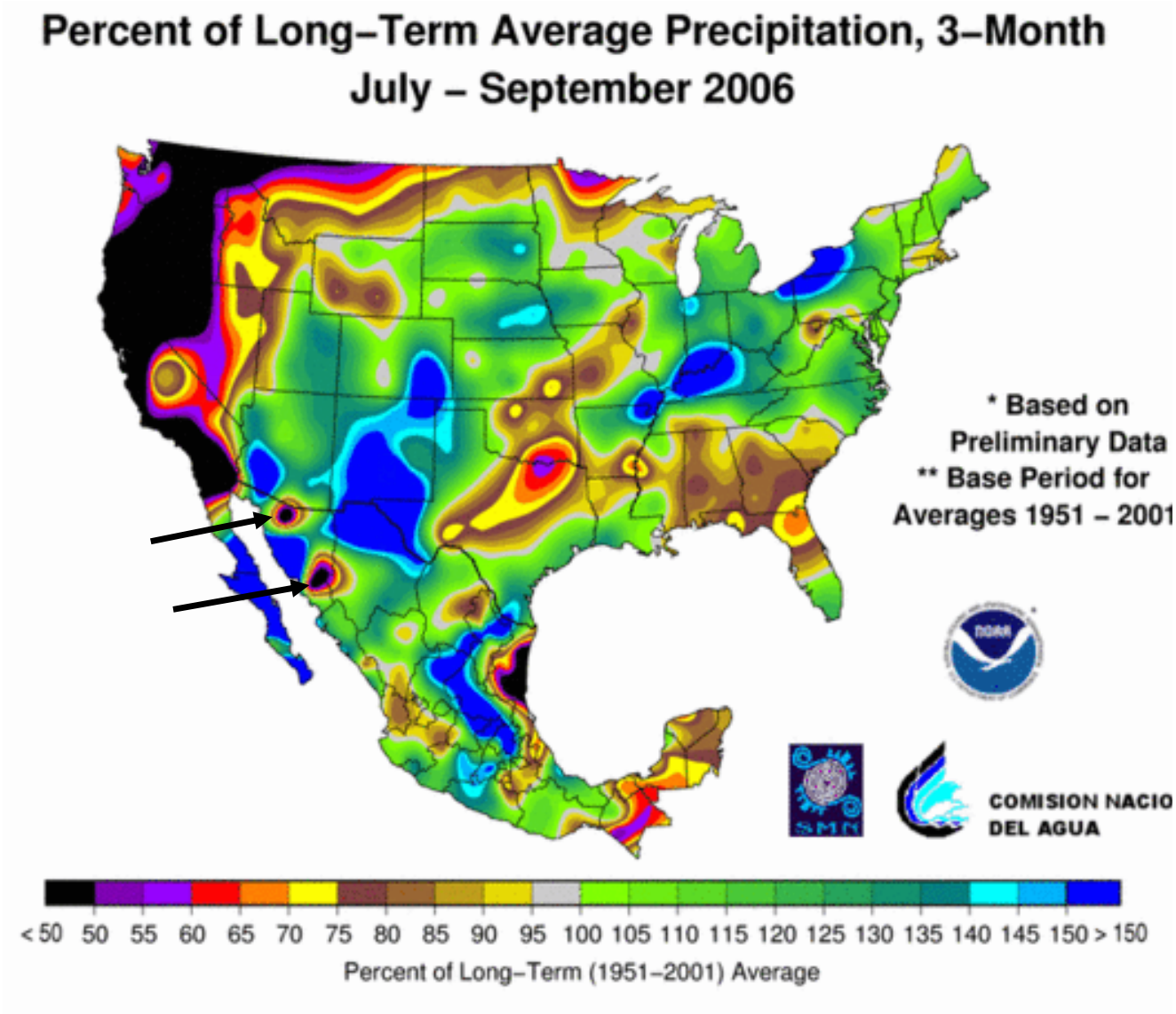


CPC (July – Sept 2006)
% normal rainfall

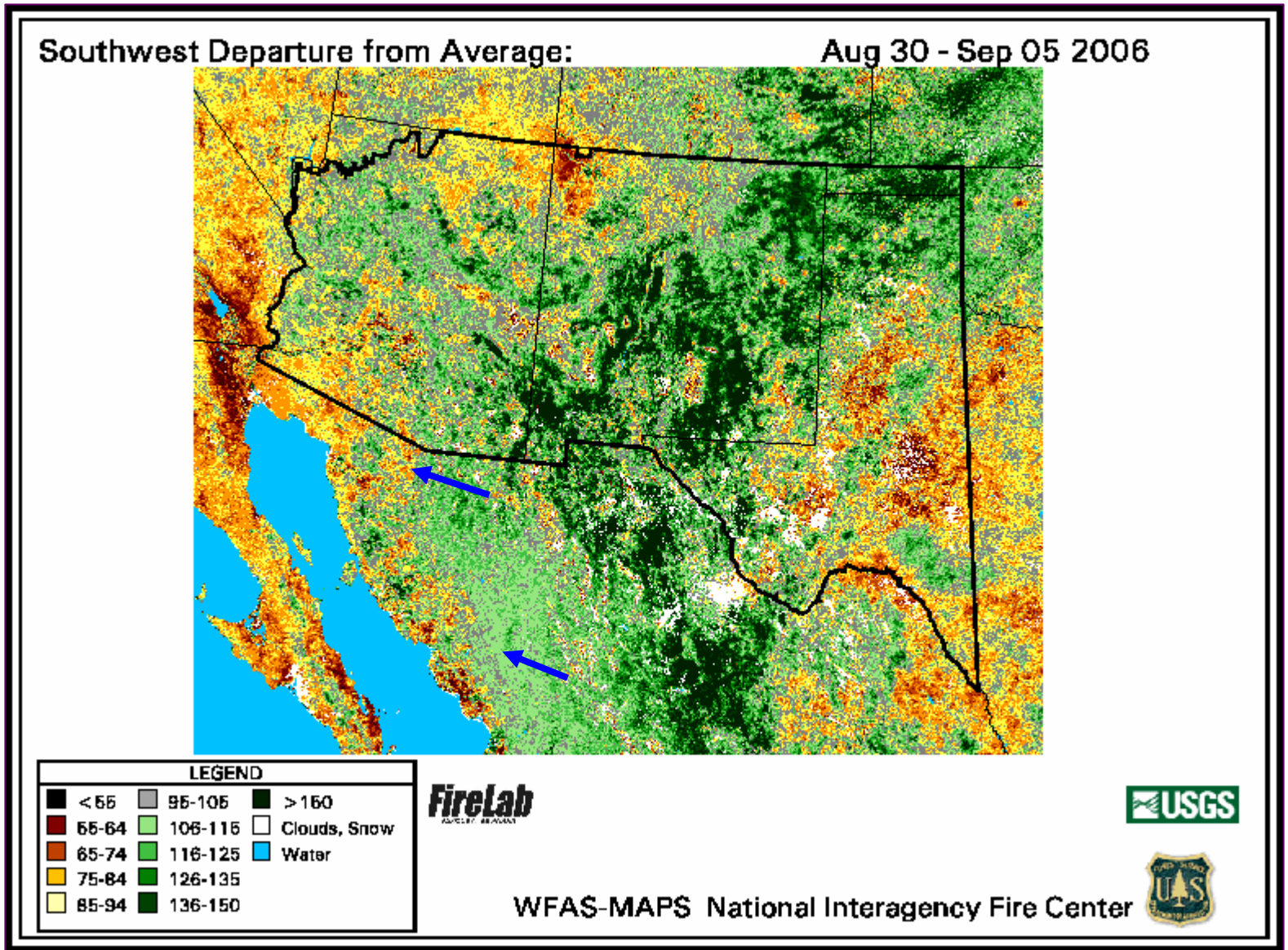


Recommendation: We need to monitor these differences more closely and determine causes for the differences in NADM and NCEP/CPC Analyses

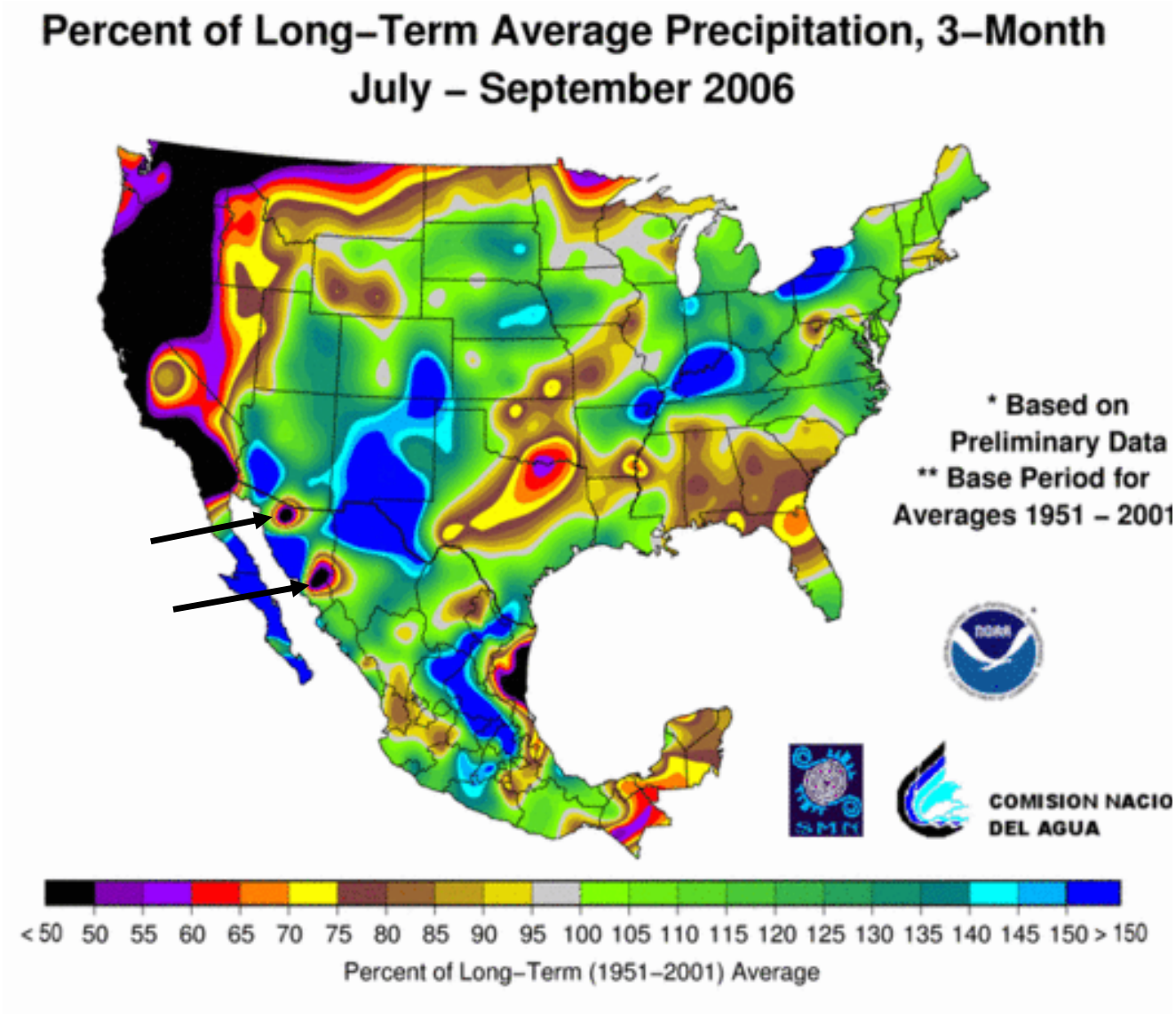
Drought Islands



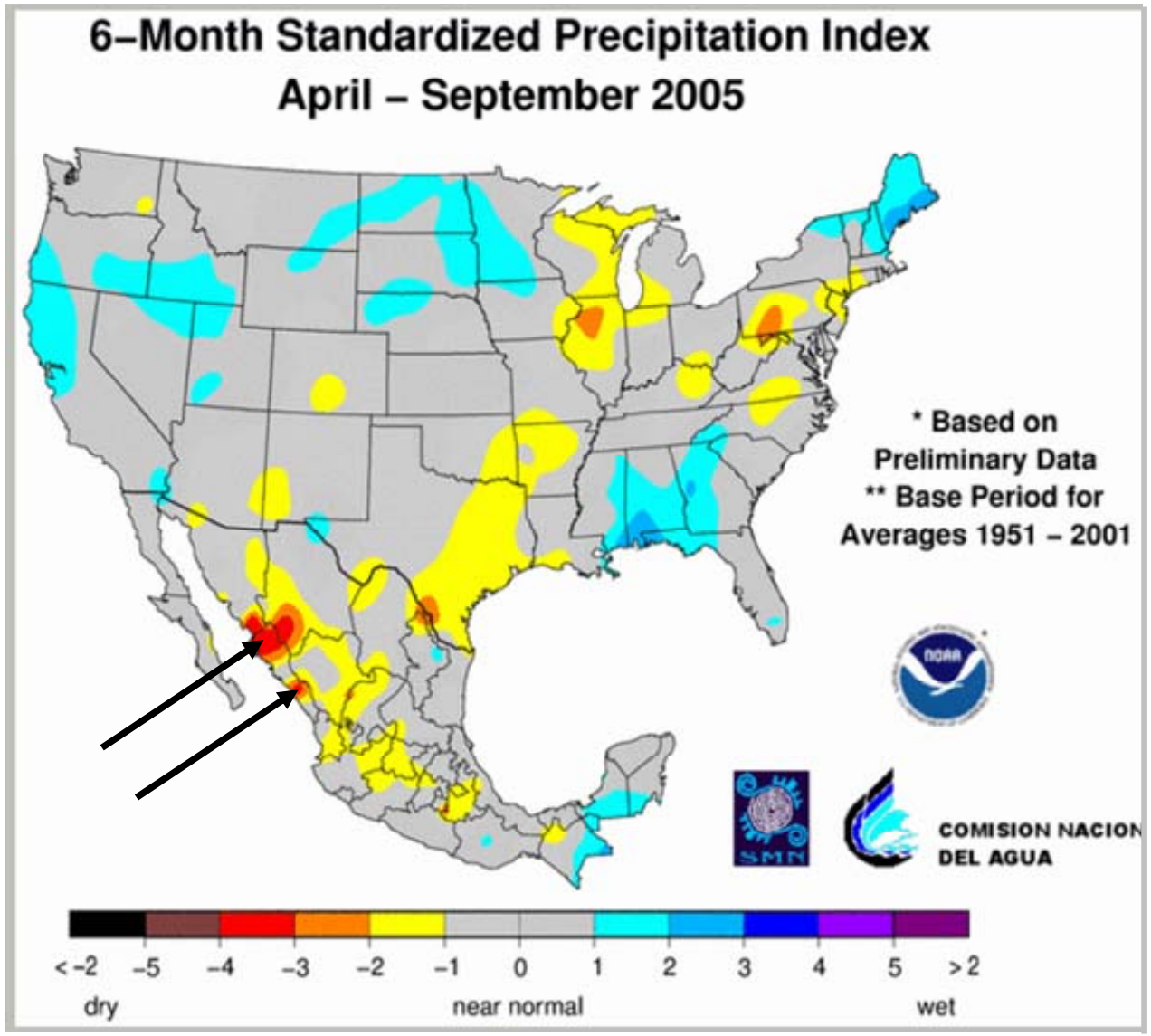
NDVI Departure from Average
5 September 2006



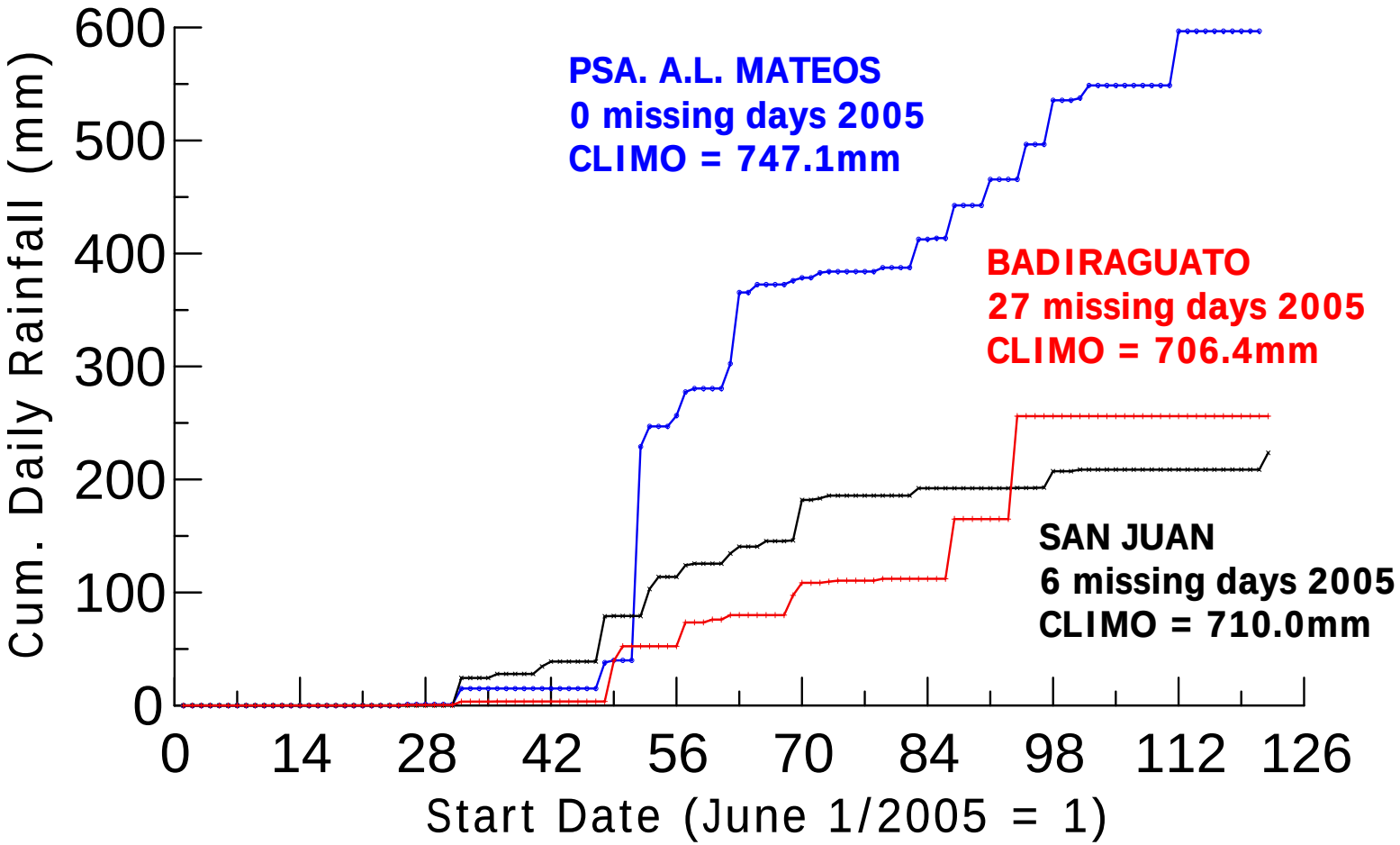
Drought Islands



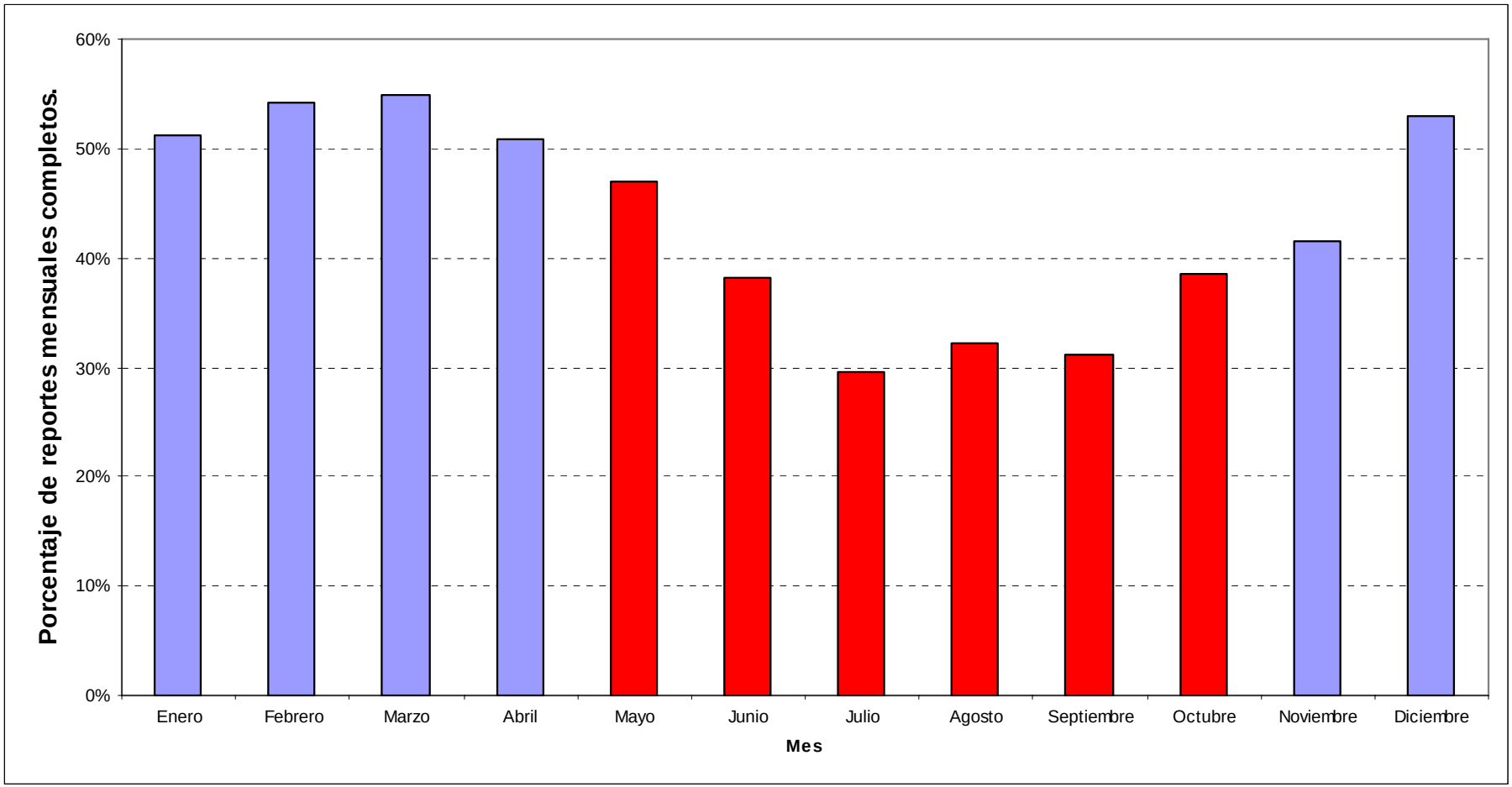
Sonora-Sinaloa Drought Islands in 2005



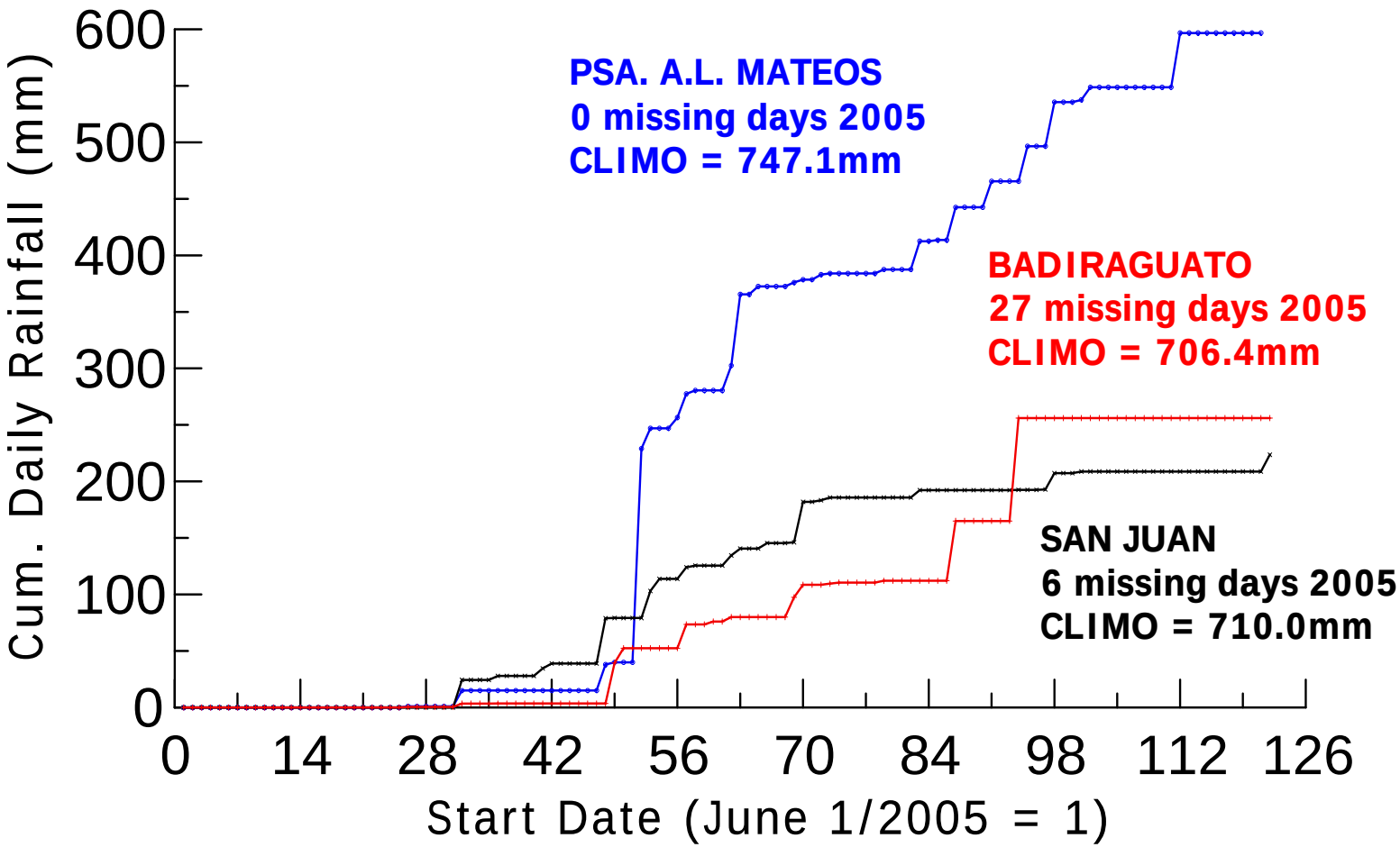
Comparative Daily Accumulated Rainfall Northern Sinaloa June-October 2005



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

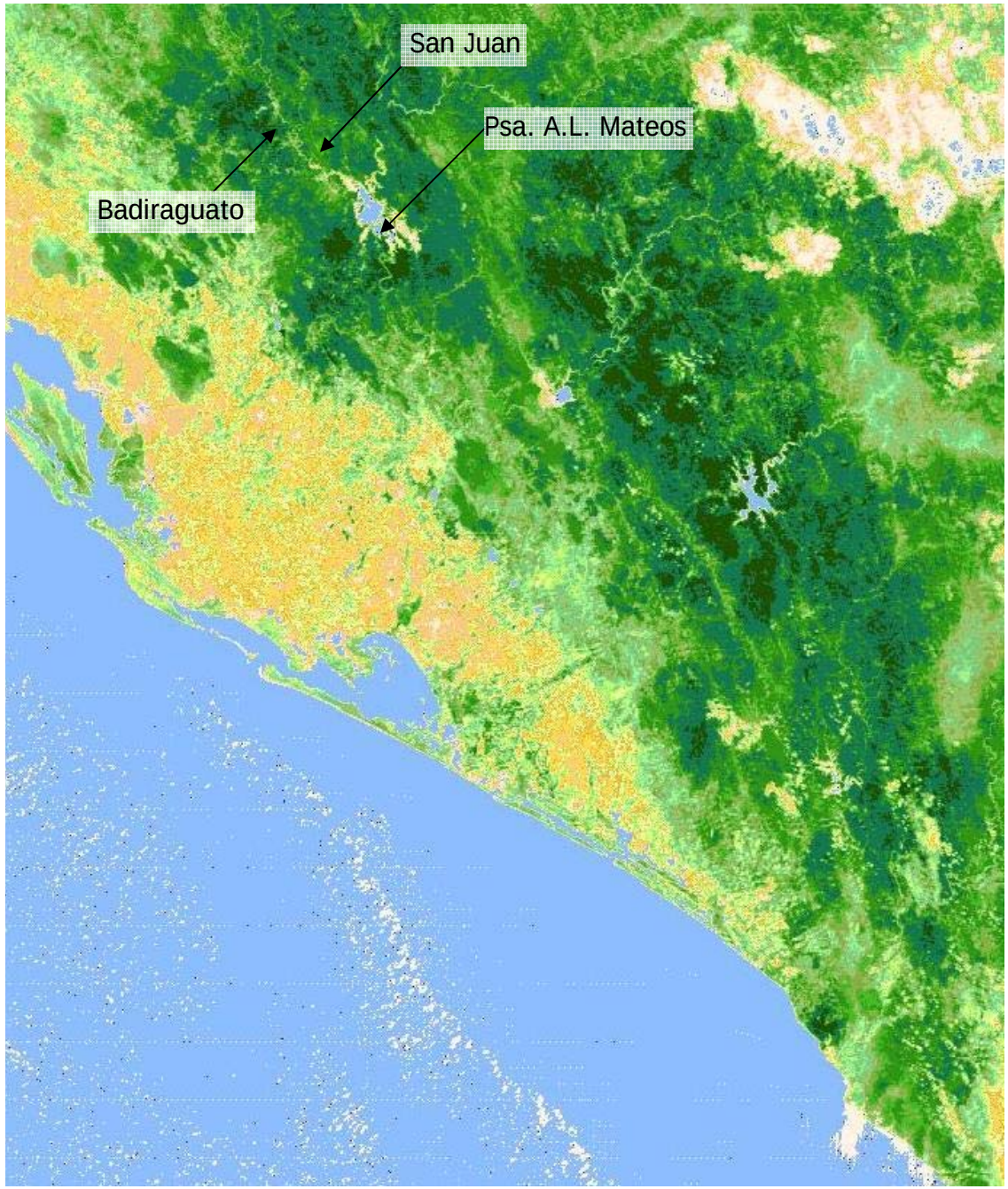


Presa Lopez Mateos: Fantastic Reporting
Badiraguato: Poor Reporting Documented
San Juan: Zeros for Fillers (OUCH!)

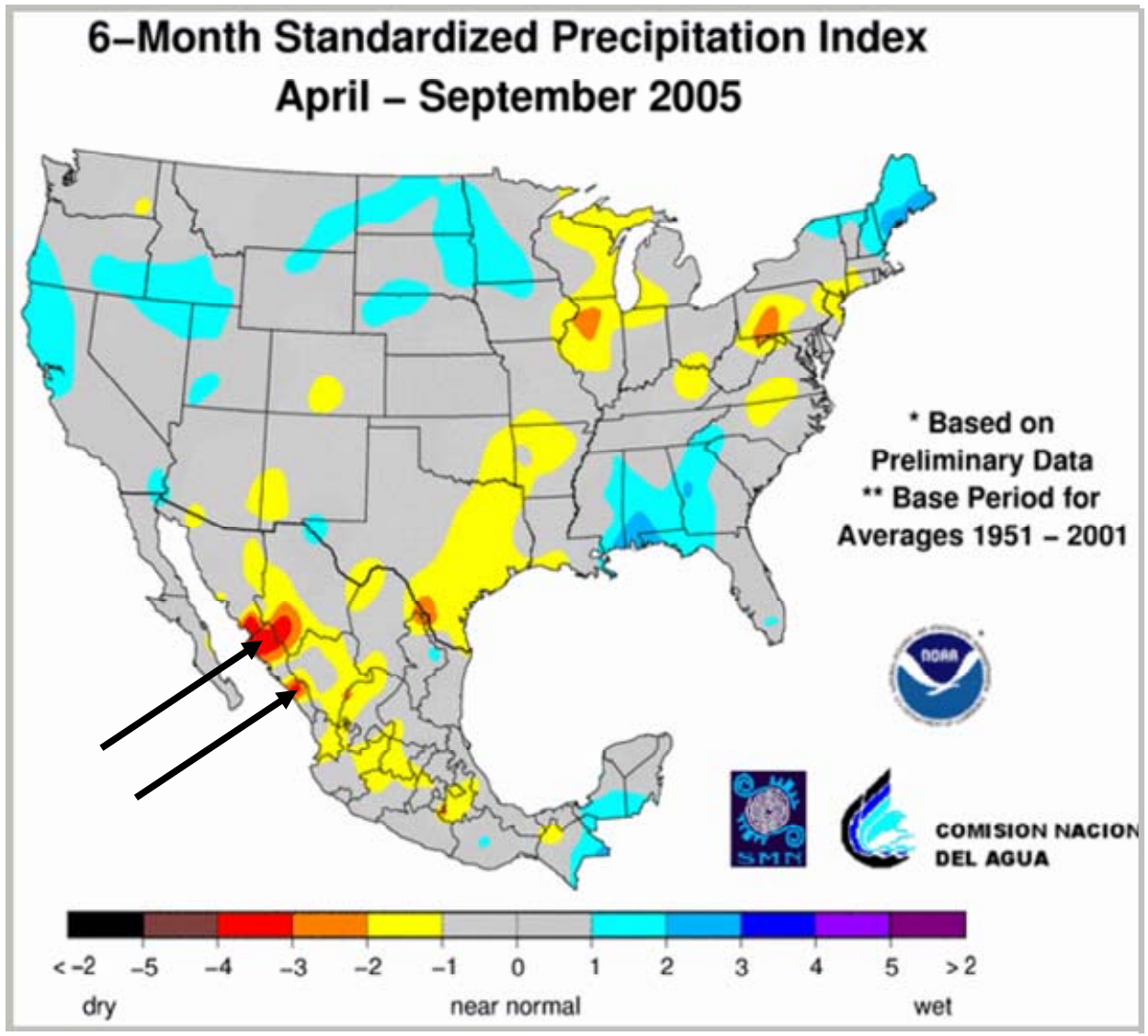


NASA
NDVI

September
2005

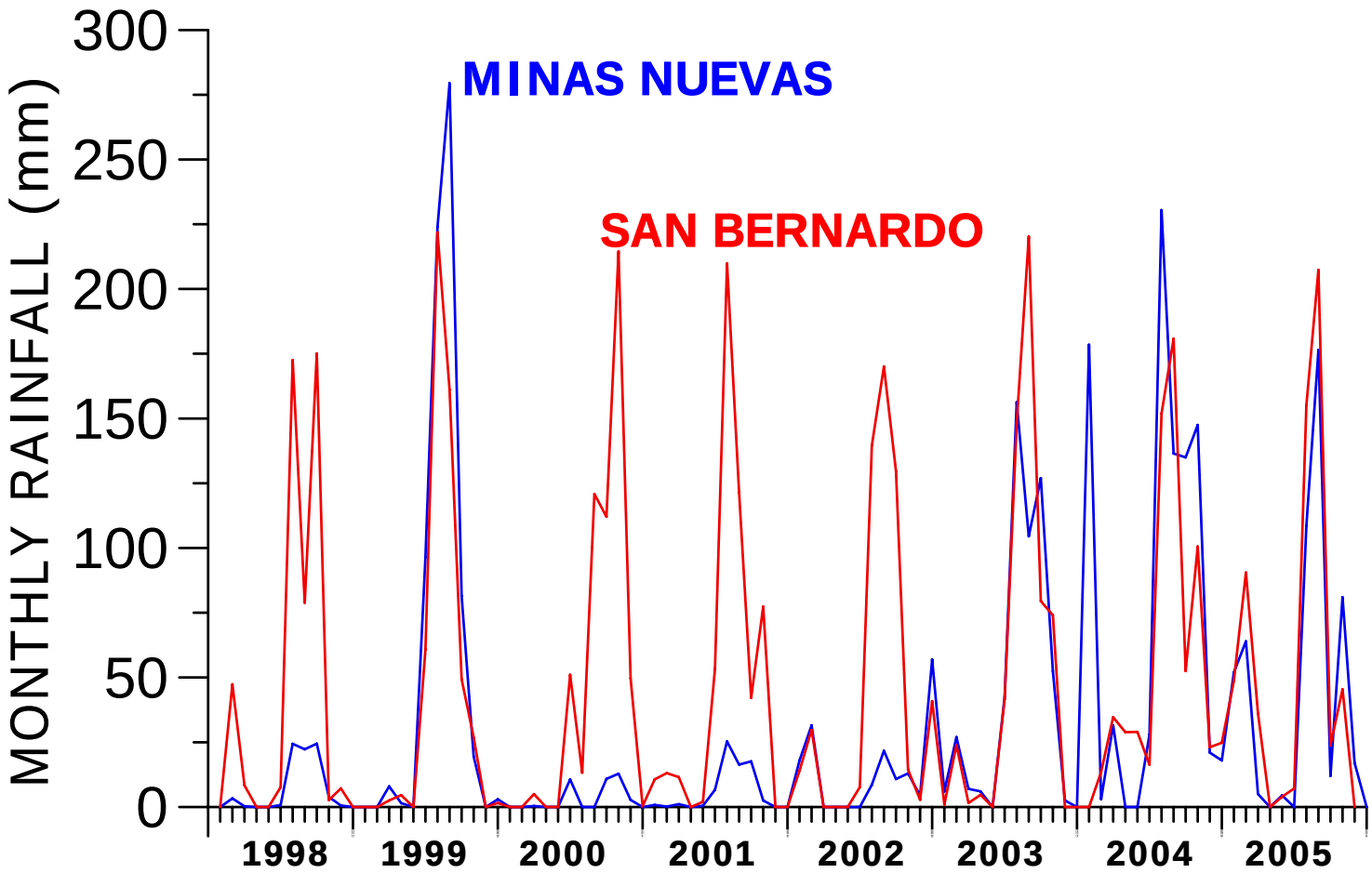


Islands of Drought…..Other Possible Reasons for their Unnatural Occurrence



The mm and cm Problem in Mexico

The MM to CM to MM Switch in Sonora

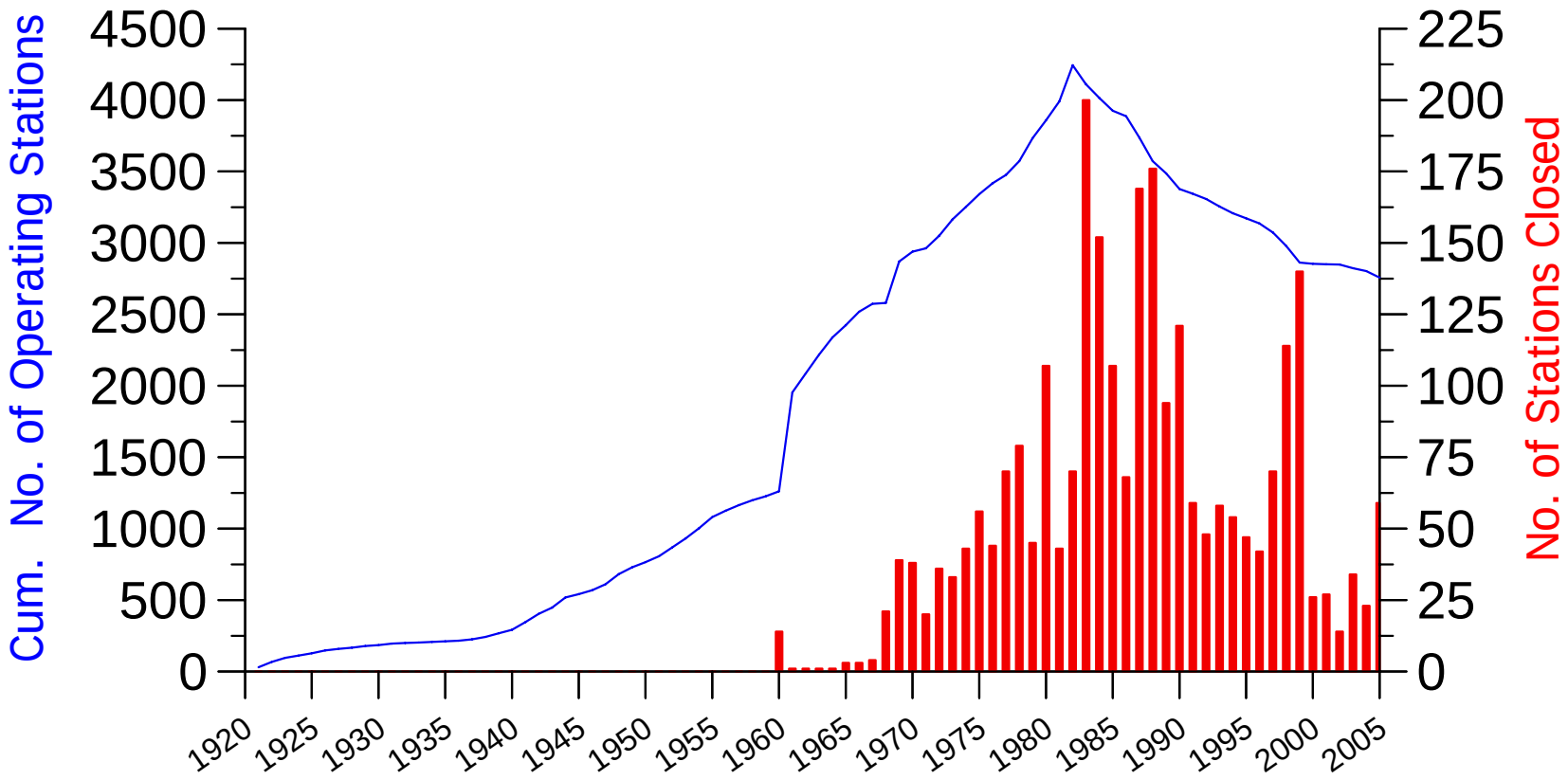


Recommendation: Drought Islands need to be watched closely for possible errors in data reporting. Increasing the NADM station grid could help confirm these areas as real drought regions or regions with inherent reporting problems.

Recommendation for Expanding the NADM Station Grid in Mexico and Developing Divisional Data Sets for Long Term Drought Monitoring and Research

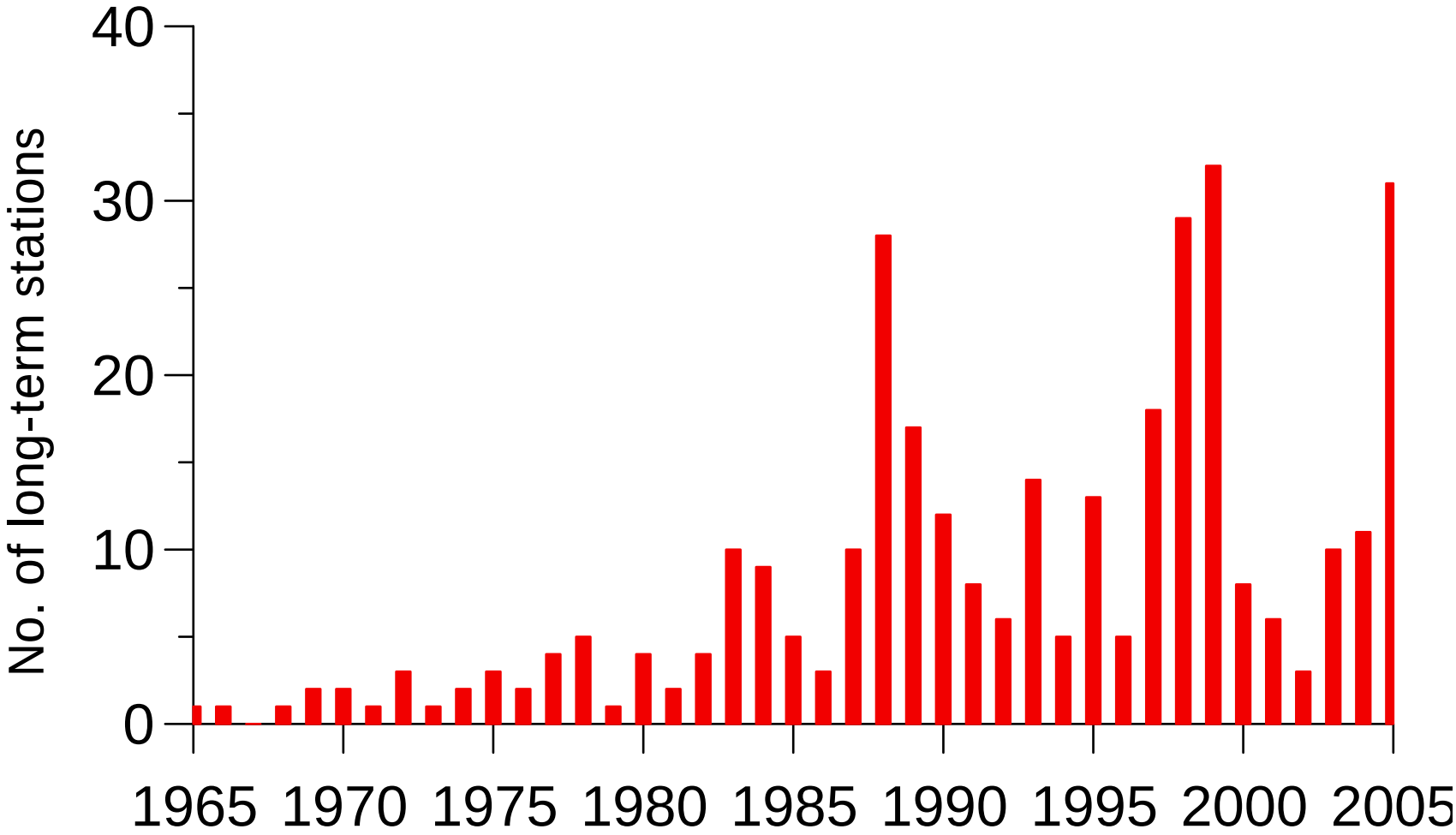
Where do we go now with the NADM in Mexico?

An Analysis of the Long Term Rainfall Station Grid in Mexico: Stations in Operation in Blue and Stations Closed in Red.

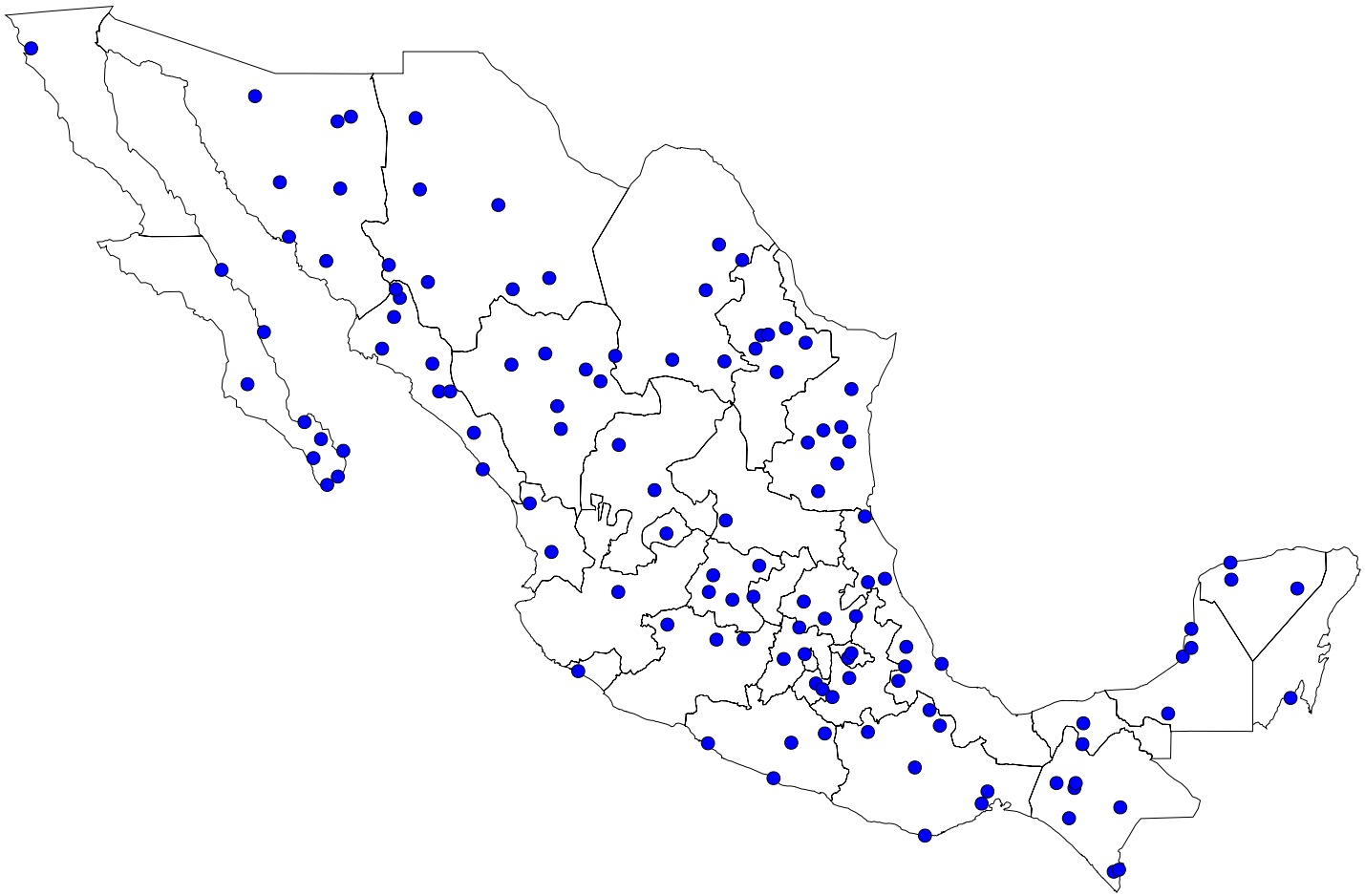


Stations with more than 40 years of record and beginning before 1965

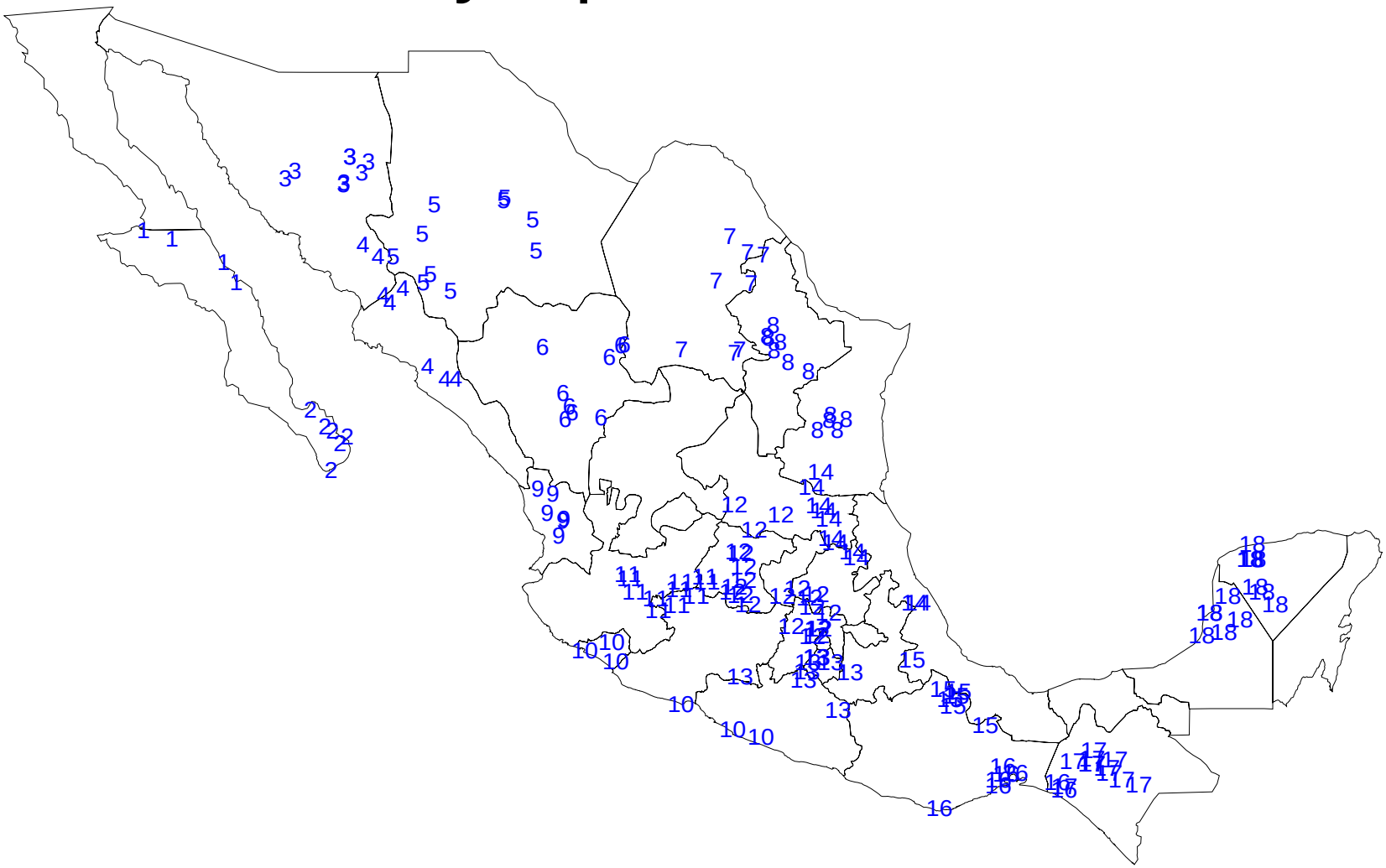
Year of Closing for Long Term Stations (>40 Years Record)



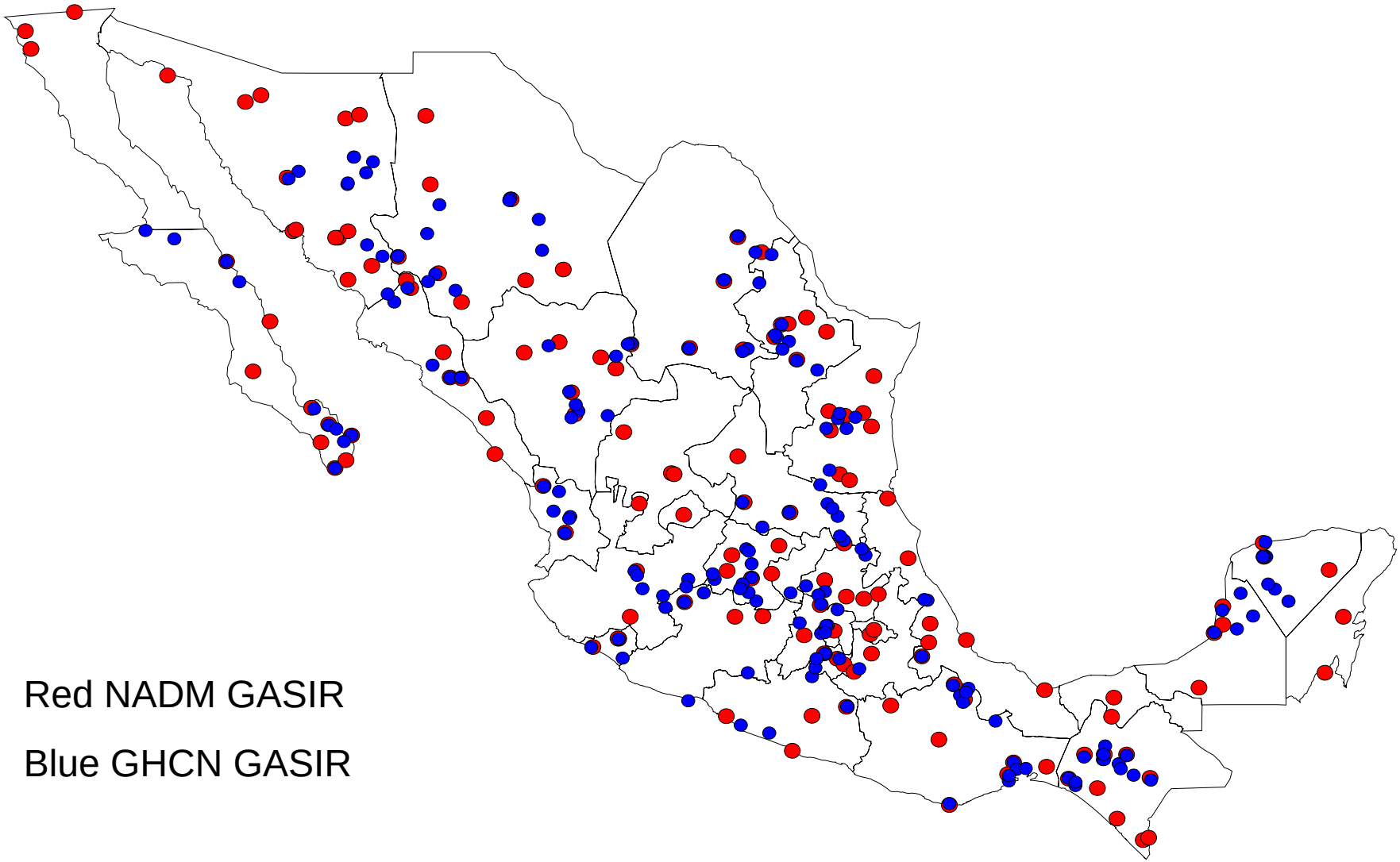
Current NADM Grid
Derived From GASIR Daily Operational Grid



The GHCN Historic Station Grid Originally Developed As Synoptic Climate Divisions Currently Updated via GASIR



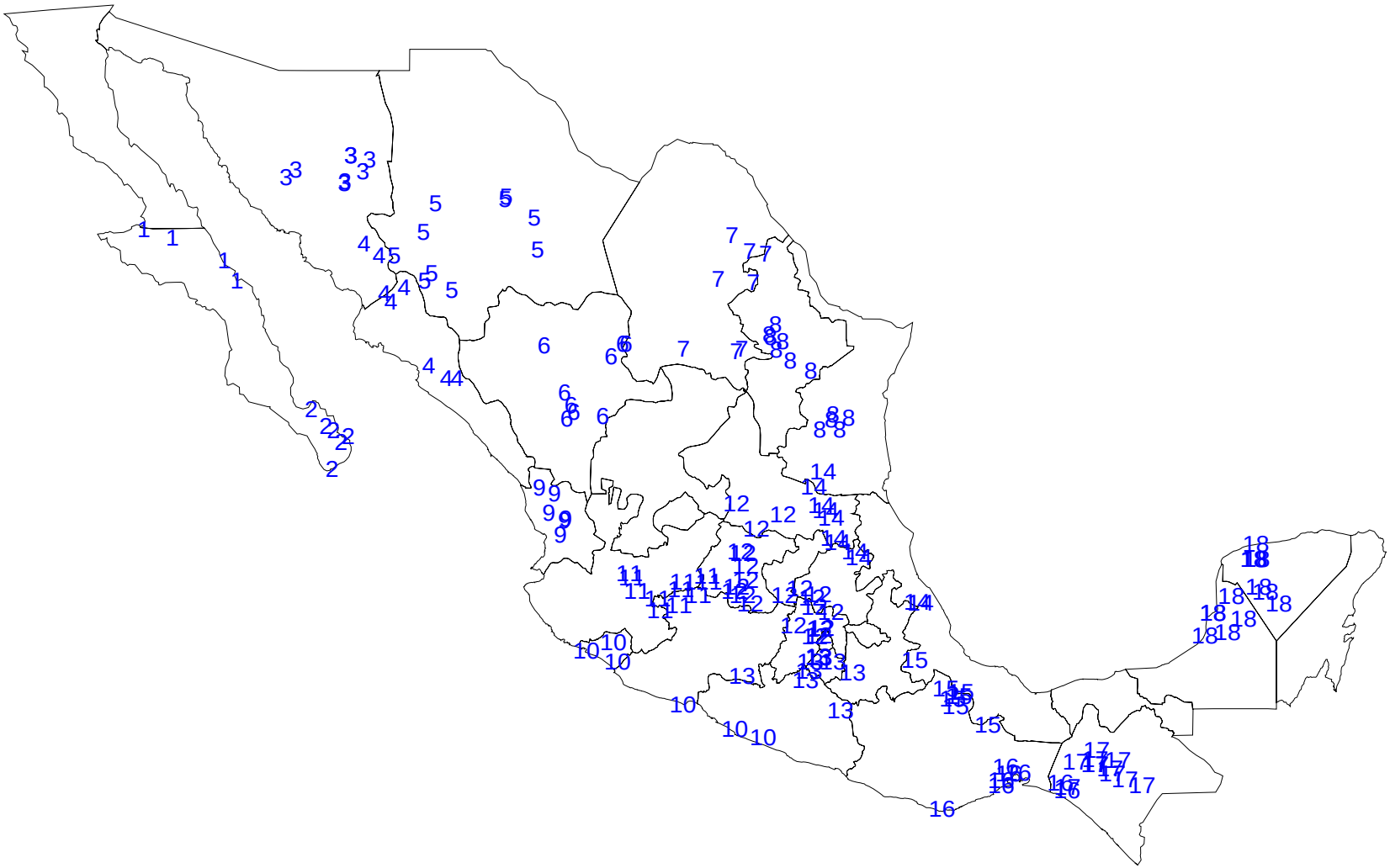
Net Effect of Combining the NADM and GHCN GASIR Grids



Red NADM GASIR

Blue GHCN GASIR

Proposal to Develop Climate Division Drought Indices for Mexico Comparable to the Original GHCN Data Sets Developed for Scientific Research and Climate Monitoring



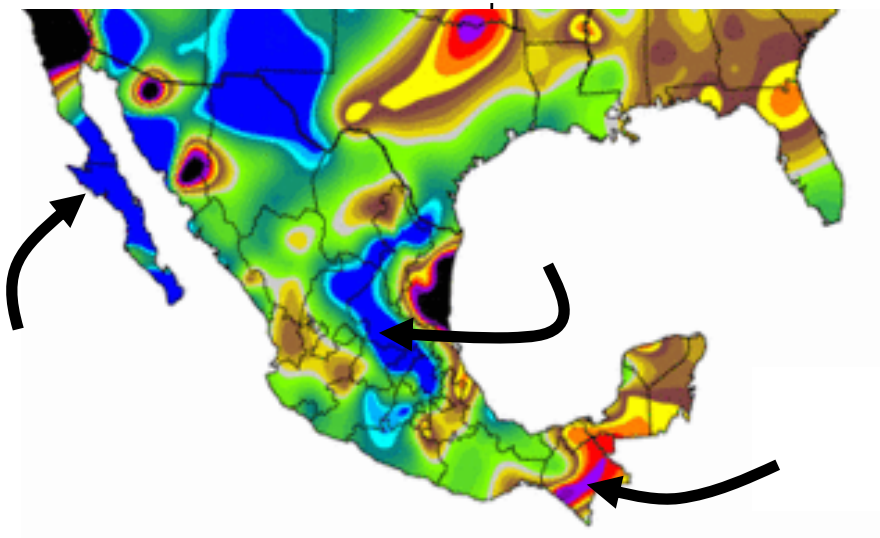
Example of Monthly Divisional Data Set Development from Daily GASIR Data

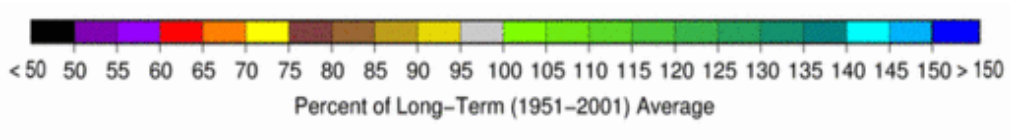
CAZANATE	SON	2001	8	4	0.00	0.00	0.00	17.50	0.00	0.00	0.00	0.00	0.01	0.00	4.00	5.00	0.00	53.20	0.01	41.50	2.00	
CHOIX, ESTACION	SIN	2001	8	4	0.00	0.00	0.01	18.00	0.00	27.00	0.00	17.50	0.00	0.00		2.70	0.00	12.80	12.80	37.50	12.50	
CULIACAN	SIN	2001	8	4	20.00	56.00	0.00			8.70	0.00	0.00	5.60	0.00	0.00	0.01	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	**175.53**

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.

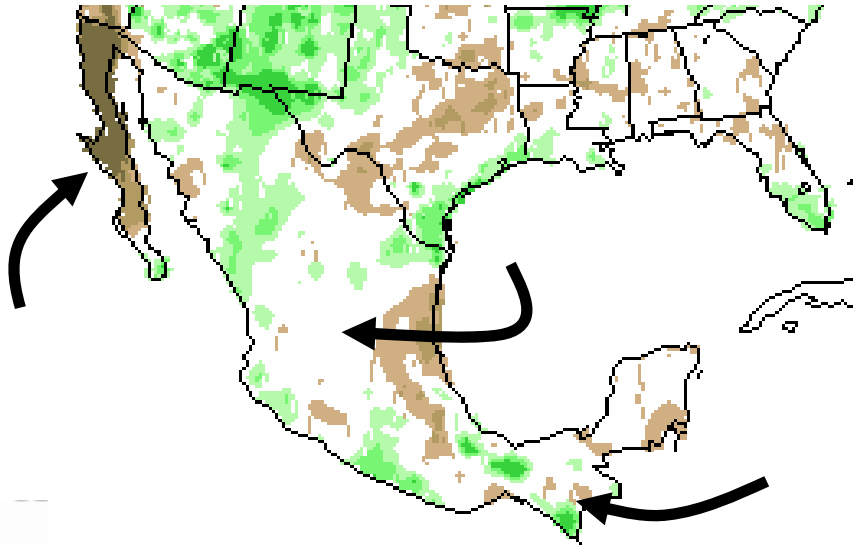
Comparison of NADM and CPC Current Month Analyses

NADM (July - Sept 2006)
% normal rainfall





CPC (July – Sept 2006)
% normal rainfall



Summary of Recommendations

1. Investigate vast differences in the CPC and NADM Precipitation analyses.
2. Expand the grid of stations used in the NADM to include stations from the GHCN network.
3. Develop climate region drought indices that focus on large scale drought trends with less emphasis on single station analysis. This data set will be aimed at the research community as well as the operational community.