

WORLD METEOROLOGICAL ORGANIZATION

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**CBS LEAD CENTRES FOR GCOS**

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## **REPORT OF THE CBS-LC-NOAA/NCDC FOR GCOS**

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### **SUMMARY AND PURPOSE OF DOCUMENT**

The document provides a summary of activities of the CBS Region IV Lead Centre-NOAA/NCDC.

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## DISCUSSION

### Background

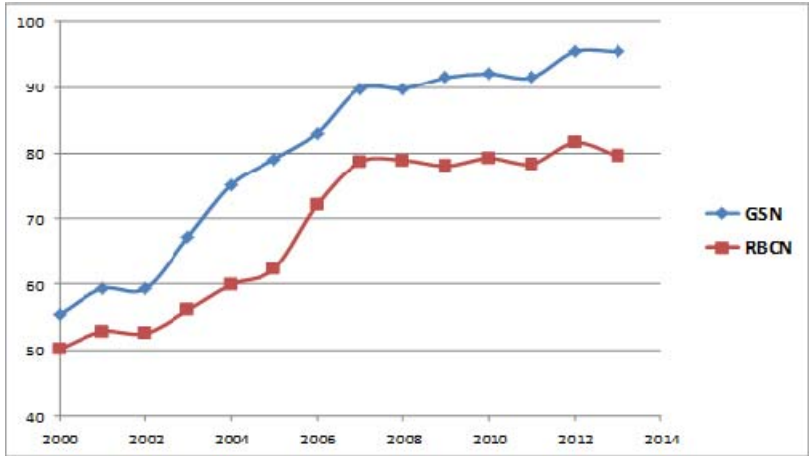
The National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Centre (NCDC) serves as the GCOS Lead Centre for Region IV and also as the Global Archive and Analysis Centre. Region IV stretches from the Canadian Arctic to the equator. It includes three large countries; USA, Canada and Mexico which contain more than 75% of the surface-based observing stations as well as many smaller countries and island nations that provide critical coverage for weather and climate observations throughout the region. The large number of small nations makes the continuing effort of coordination and support an essential part of ensuring the health of the region's observing network.

This report contains a summary of the state of the surface-based global observing system for GSN and GUAN networks with a specific focus on those provided by Region IV members. NCDC provides monthly updates of web accessible GSN and GUAN reports which provide information on the number of hourly, synoptic, and CLIMAT reports received at the Center. The reports are available at <ftp://ftp0.ncdc.noaa.gov/pub/data/gcos/>. Representatives from other Lead Centers are invited to review these reports and provide feedback on their usefulness and any recommendations for further changes. There are two basic types of reports; the first providing an annual total of the number of reports received by type and hour of the day and secondly files that provide month-year totals of the number of hourly and synoptic reports received and information on CLIMAT receipt.

### Performance of the GSN network in Region IV

There are 177 GSN stations in the 2014 inventory for Region IV. Canada and the U.S. have the greatest number of stations; 85 and 67 stations, respectively. Figure 1 shows a large improvement in the percentage of GSN stations providing CLIMAT observations in at least nine months each year. The GSN network increased to more than 95% in recent years. The performance of the full RBCN network of CLIMAT stations is included for comparison.

Figure 2 shows GSN stations providing at least nine CLIMAT reports in 2013. The greater than 95% coverage of stations in the GSN network with good reporting practices indicates the benefit that careful monitoring and attention to the performance of a subset of stations can provide to improving data collection. No GSN stations were silent in 2013, but system outages resulted in some stations providing less than complete annual coverage, most notably in remote areas for which unscheduled maintenance cannot be readily performed (Table 1).



**Figure 1. The percentage of Region IV RBCN stations providing CLIMAT reports (red line) and the subset of GSN stations (blue line) providing CLIMAT reports in at least nine months each year from 2000 through 2013.**



**Figure 2. The 177 Region IV stations in the GSN network with nine or more (red) and fewer than nine (blue) CLIMAT reports in 2013.**

**Table 1. Region IV GSN stations with reporting issues in 2013.**

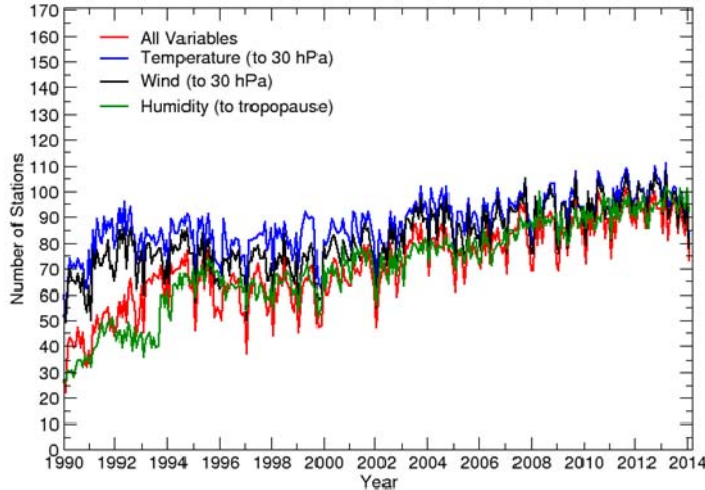
<b>Data-Months</b>	<b>WMO #</b>	<b>Station Name</b>	<b>Country</b>	<b>Issue</b>
9/2013-Present	70086	Barter Island	United States	Sensor issue at the site during the affected data-months.
9/2013-Present	91701	Kanton Island	Kiribati	Awaiting details from point of contact regarding station status.
9/2013-Present	71907	Inukjuak	Canada	Transmission problems.
8/2013-11/2013	71665	Nain	Canada	Transmission problems beginning Sep 13, resolved Dec 13
6/2013-9/2013	78384	Owen Roberts	Cayman Islands	Data transmission problem resolved in Oct 13
6/2013-9/2013	78767	Puerto Limon	Costa Rica	Data transmission problem resolved in Oct 13
2/2014-Present	71074	Isachsen	Canada	Station has a power issue and station's generator will be replaced during the annual station visit.
12/2013-Present	71844	Big Trout La	Canada	Was decommissioned as of early December 2013 and the GENOT (General Notice) will be issued to the global community.
12/2013-Present	71049	Wager Bay	Canada	Station has communication issues, the GOES transmitter may be misaligned. The technicians will not be able to service the station until late Summer 2014.
11/2013-Present	71017	Stefansson Island	Canada	Station has experienced a power failure (faulty wind generator leading to low voltage). This high Arctic station will be repaired during the summer months (2014).
1/2014-Present	71989	Mould Bay CS	Canada	Observations missing since early January 2014 due to icing on the solar panel and/or drained batteries. When there is sufficient sunshine, the batteries will be recharged. Station visit will occur in June 2014.
1/2013-9/2013	71773	Whitehorse	Canada	Observations from 71964 were to have been transferred to this station. Resolved in Oct 13.

## Upper Air Observations

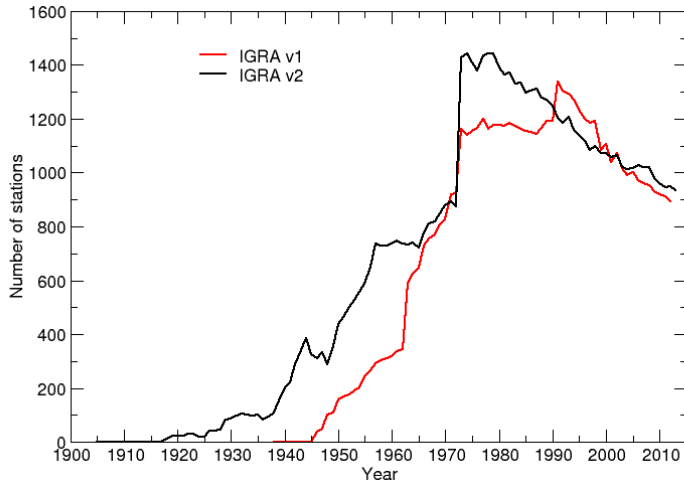
Ongoing rehabilitation and system improvement efforts have led to increases in the collection and reporting of data from the GUAN network over the past three decades with steady to slightly increasing reporting during the past few years (Figure 3). For the globe as a whole, more than 160 GUAN stations were operating at some point in 2013, and approximately 90 met minimum performance requirements for all variables. Region IV GUAN stations with lengthy operational problems are listed in Table 2.

NCDC's Integrated Global Radiosonde Archive (IGRA) serves as the database for the GUAN. IGRA version 2 is in the latter stages of development at NCDC, and a beta release is planned for September 2014. The construction of IGRA-2 involves reconciling radiosonde records from 33 different sources representing approximately 20,000 "non unique" station records. In many cases, records for one location are available from multiple sources that sometimes contain data for overlapping periods of record and/or for complementary years.

IGRA version 2 will have between 43 and 44 million soundings. A few hundred thousand soundings from the ERA-CLIM historical upper-air data still need to be incorporated into the IGRA merge algorithm. The number of unique soundings in version 2 will be approximately one third larger than in IGRA version 1. As shown in Figure 4, most of the additional soundings in version 2 are for earlier years in the period of record.



**Figure 3. Time series of the number of GUAN stations meeting the minimum performance requirements. Perfect receipt = 171.**



**Figure 4. Estimated number of stations by year in IGRA v1 versus IGRA v2.**

**Table 2. Region IV GUAN stations with recent reporting issues.**

WMO#	Station Name	Country	Issue
78762	Juan Santa Maria	Costa Rica	Stopped reporting on 5 Dec 13
78397	Kingston	Jamaica	Problem with tracking system since mid-July 2012. Contract awarded in early March 2014 for replacement of Hydrogen Generator).
78583	Belize	Belize	Intermittent launch success since June 2013. Only 28 GUAN observations in February 2014.
78988	Curacao	Netherlands Antilles	Antenna problems beginning April 2013. Currently transmitting 12Z soundings.