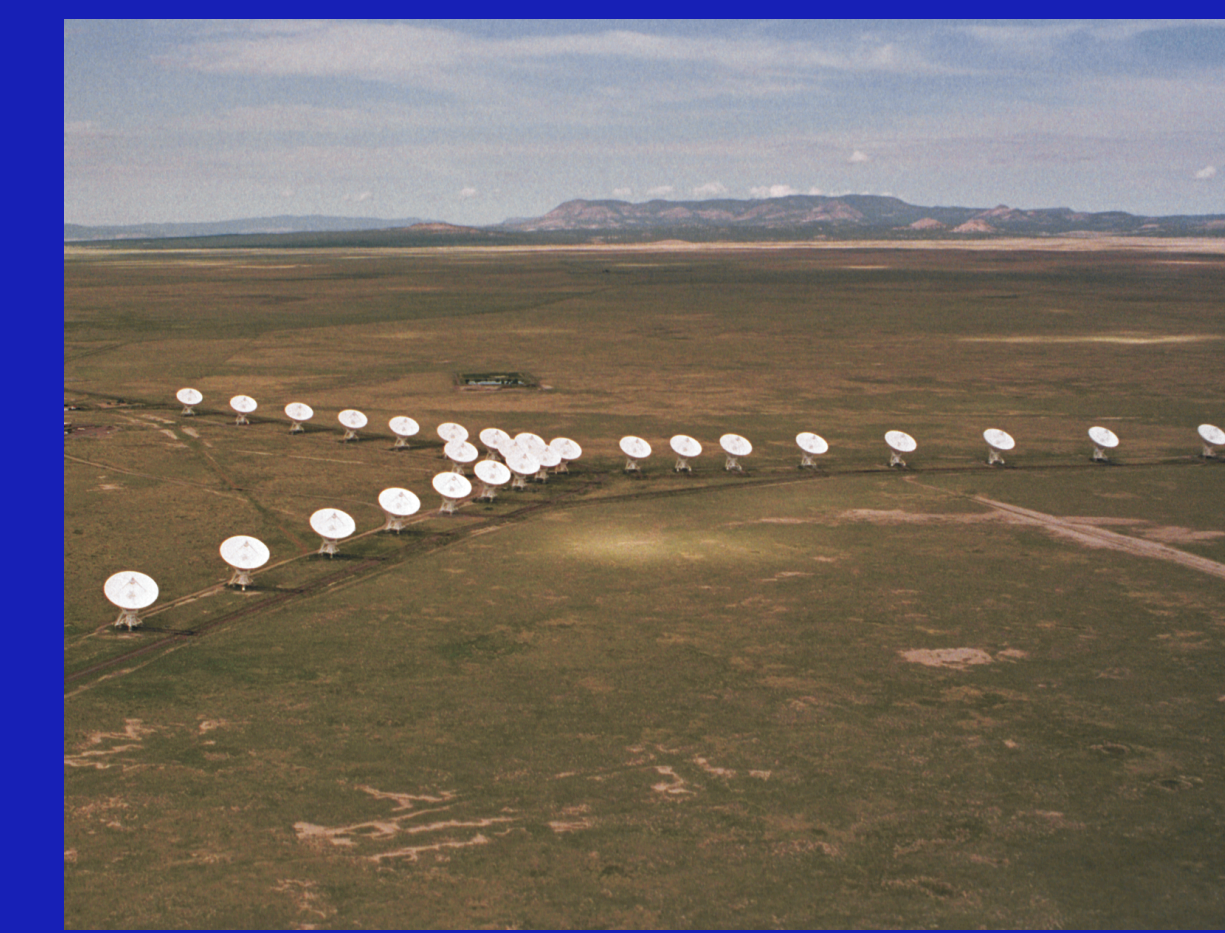




NRAO VLA Archive Survey (NVAS)

J. H. Crossley, L. O. Sjouwerman, E. B. Fomalont, N. M. Radziwill
National Radio Astronomy Observatory (NRAO)



<http://archive.nrao.edu/>

Abstract

The Very Large Array (VLA) radio telescope has been collecting interferometric visibility data since the late 1970's. The VLA raw data archive is a huge resource for radio images of astronomical sources. However, an in-depth knowledge of radio astronomy techniques (including data calibration, FFT processing, and deconvolution methods) is needed to obtain images from the visibility data. To make the VLA data archive useful for all astronomers, NRAO has started the NRAO VLA Archive Survey (NVAS). NVAS is a collection of images, calibrated data, diagnostic plots, and log files produced by automated processing of raw ("visibility") data from the VLA raw data archive. NVAS is accessible through the archive interface at the web address above. NVAS data enhance the VLA archive by providing images, calibrated data, and diagnostics for every purpose from quick data inspection to scientific analysis and publication.

How are NVAS images made?

NVAS images are generated in a data reduction pipeline (the VLA Pipeline System). The pipeline consists of 4 stages (shown below) that automate all processes from raw data download to placement of images and calibrated data on the web server. The central engine of the pipeline is the Astronomical Image Processing System (AIPS), which performs all data reduction including editing, calibration, imaging, flat-fielding, and blanking. The final stage of the pipeline is human-interactive data validation.

1. Data Acquisition

- a) Download raw data from archive
- b) Prepare for processing

2. Processing (AIPS)

- a) Editing
- b) Calibration
- c) Imaging
- d) Finalize image

3. Export to archive

Send image, calibrated data, diagnostics, and logs to archive

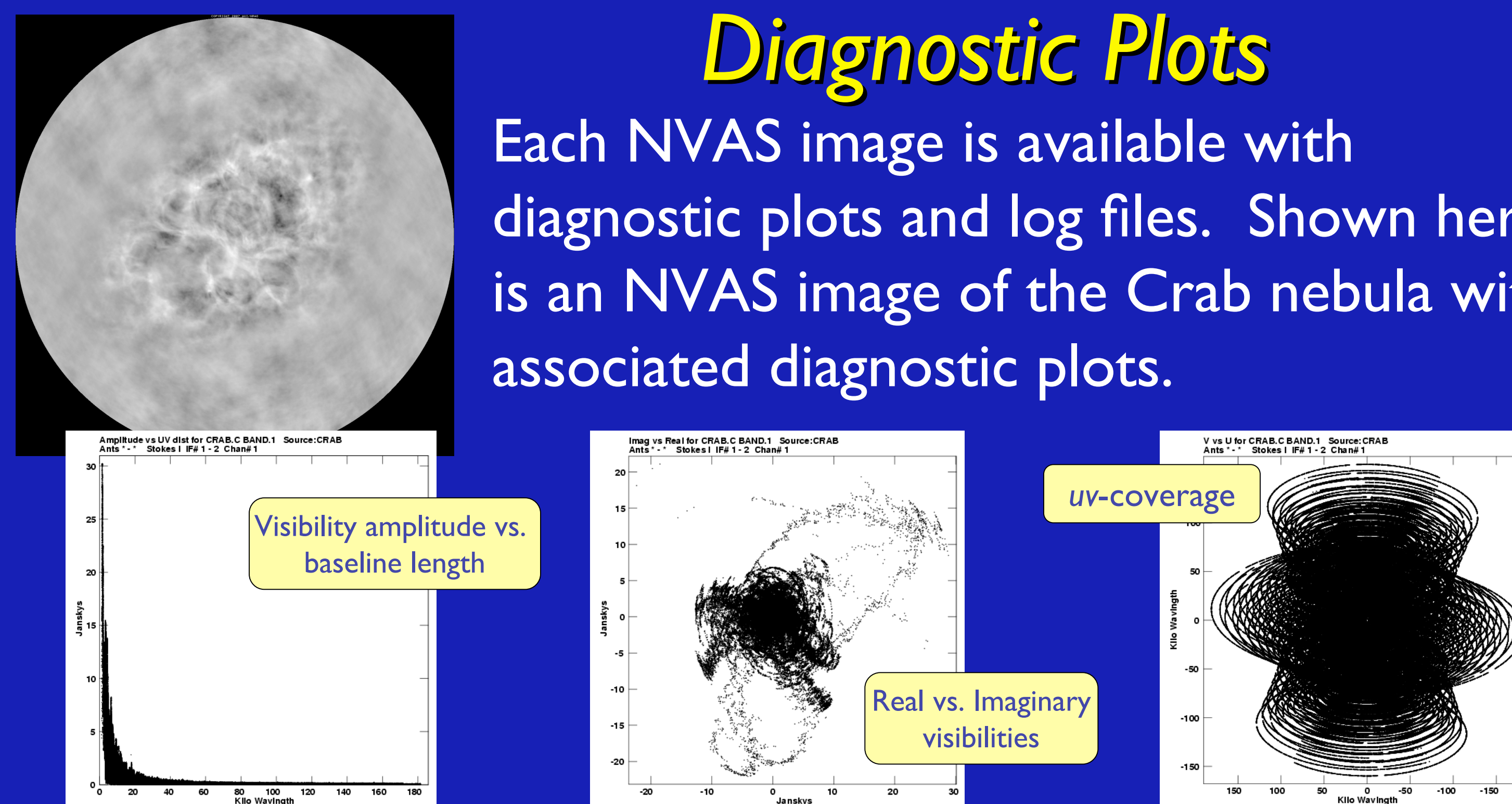
4. Validation

Look at image and diagnostics to ensure successful processing

	NVAS at Present
Number of Images	72,000+
Unique sky positions	15,000+
Dates	1991 to 2003
Frequencies	1 to 50 GHz
Observing Modes	Continuum
Array Configurations	D, C, B, and some A

Diagnostic Plots

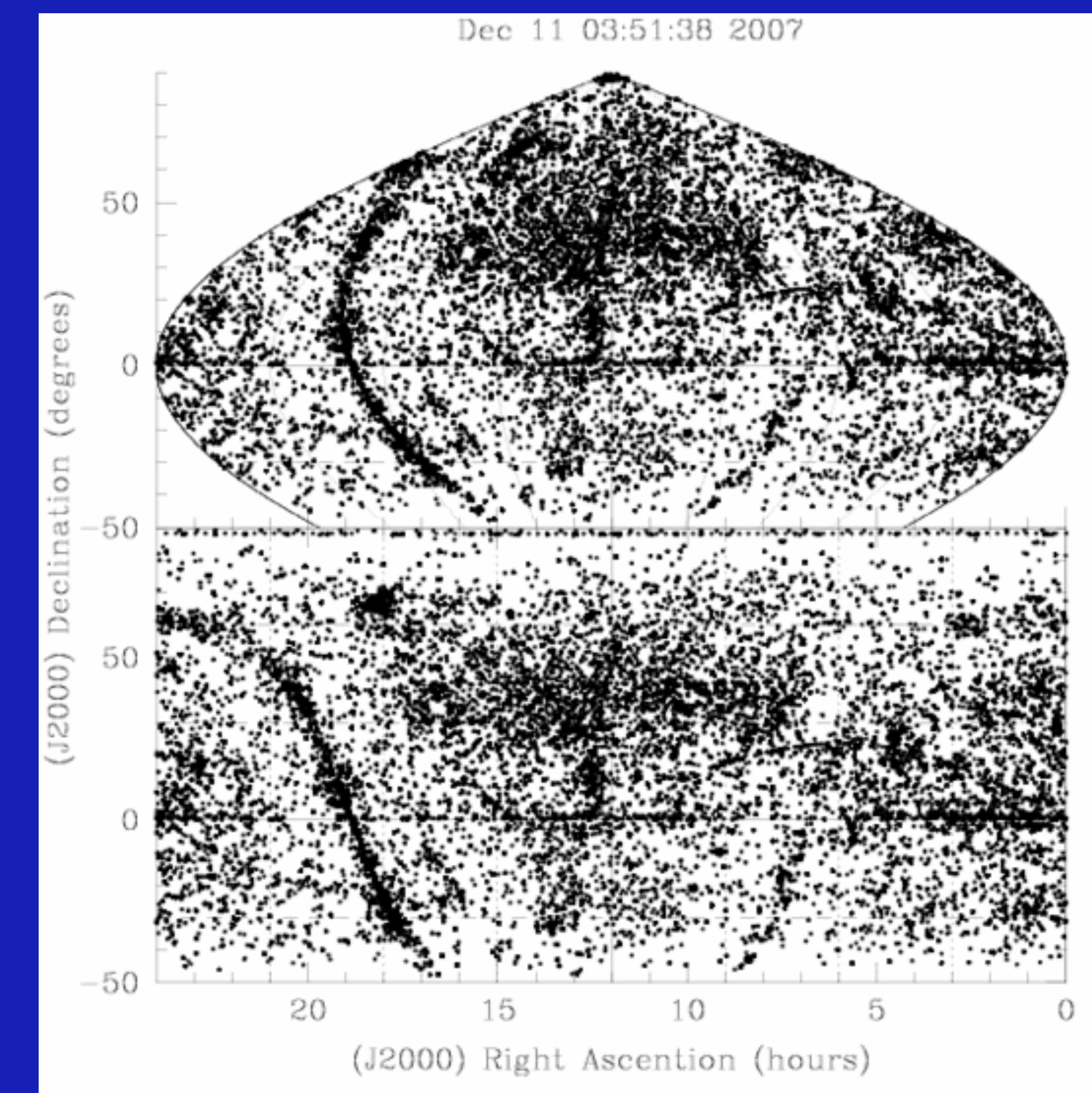
Each NVAS image is available with diagnostic plots and log files. Shown here is an NVAS image of the Crab nebula with associated diagnostic plots.



NVAS Future plans?

Three phases are currently planned for NVAS.

1. Complete imaging of all continuum VLA data: 1979 to present (*in progress*).
2. Improve data flagging and incorporate self calibration into the data reduction process.
3. Extend the survey to include spectral line observations.



Current NVAS Sky Coverage

How good are NVAS images?

- The automated NVAS pipeline is designed to make good images most of the time. NVAS images are produced on a best effort basis, and image quality varies depending on the exact nature of the observation.
- To make image quality assessment easier for the end user, NVAS contains, in addition to images, diagnostic plots, log files, and calibrated visibility data.
- All images and diagnostics are reviewed by a human. Low quality images are removed from the survey.

From the NRAO archive, NVAS images can be browsed in a web page table.

