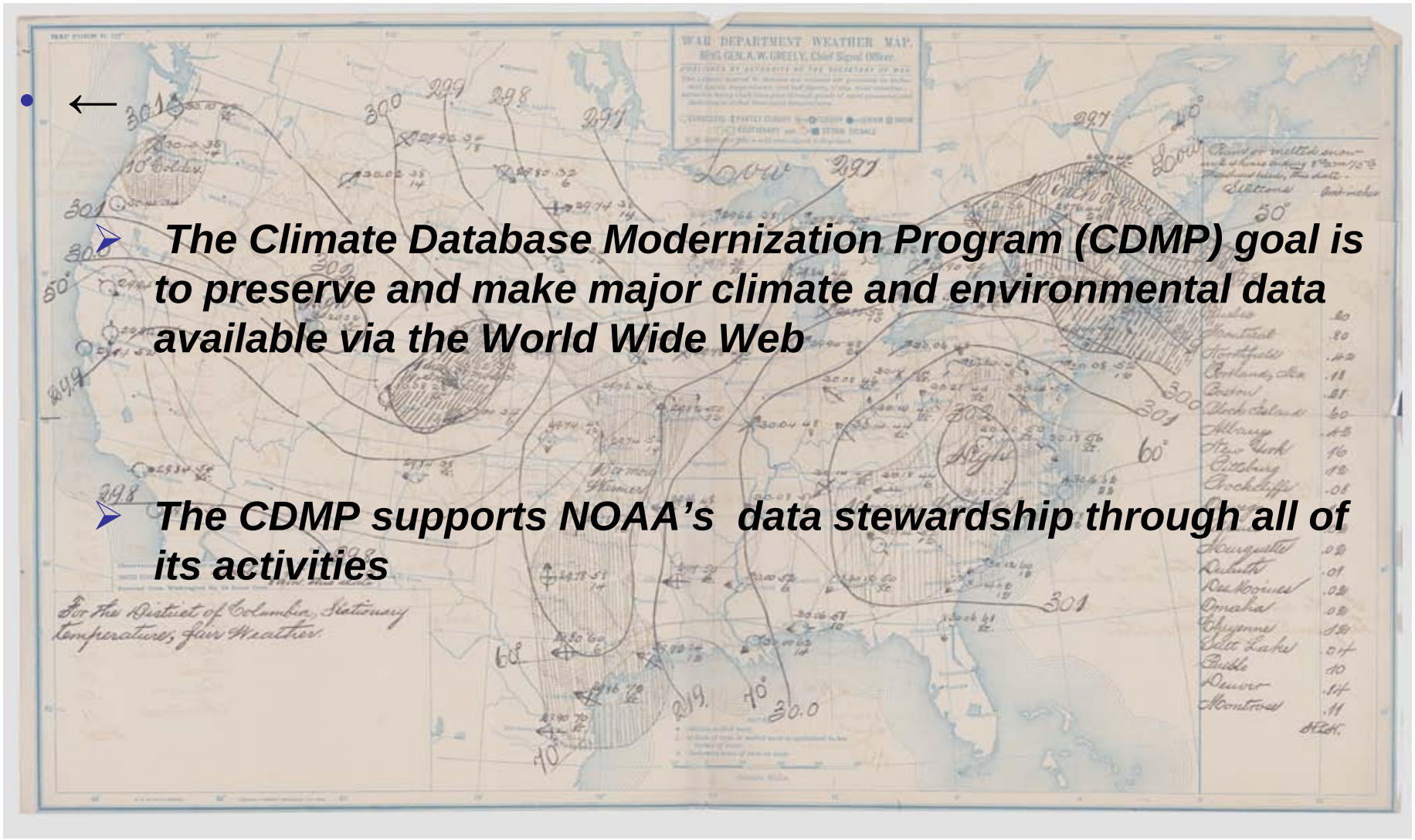
NOAA's Climate Database Modernization Program- Data Rescue Activities

Program Manager- Tom Ross- ECIP Federation Talk

Climate Database Modernization Program



- ←

- ***The Climate Database Modernization Program (CDMP) goal is to preserve and make major climate and environmental data available via the World Wide Web***

- ***The CDMP supports NOAA's data stewardship through all of its activities***

Climate Data Base Modernization
Outcomes & Benefits to the Nation

Outcomes

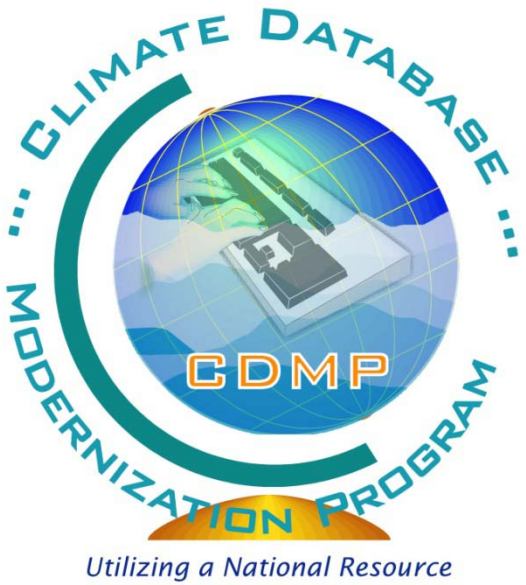
- **Improved access and digital conversion** of data stored on aging paper, film & obsolete digital media
- **Provides partnerships and jobs** through private sector companies in 4 states- 300 + jobs

Benefits to the Nation

Human Dimension: Reduced loss of life & impacts due to environmental events

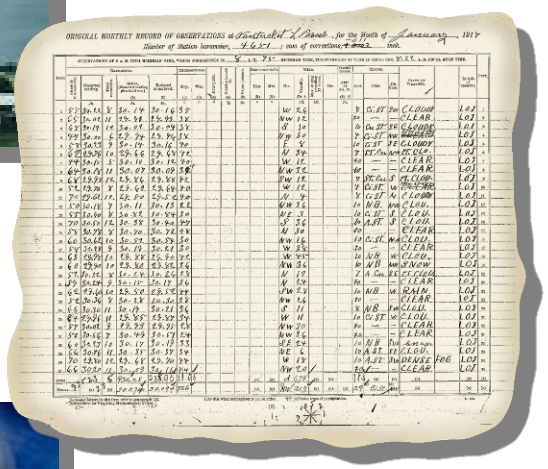
Business Dimension: Enhanced opportunities and socio-economic gains by considering climate information in decisions

Policy Dimension: More effective government policy by appropriately using climate information in decisions



Tenth anniversary of the program (began 2000)

Data Received From Many Sources

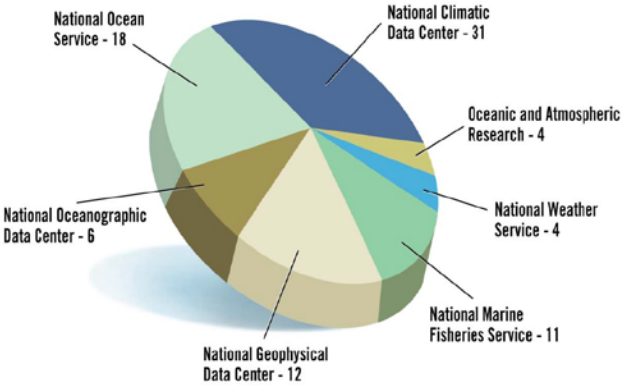


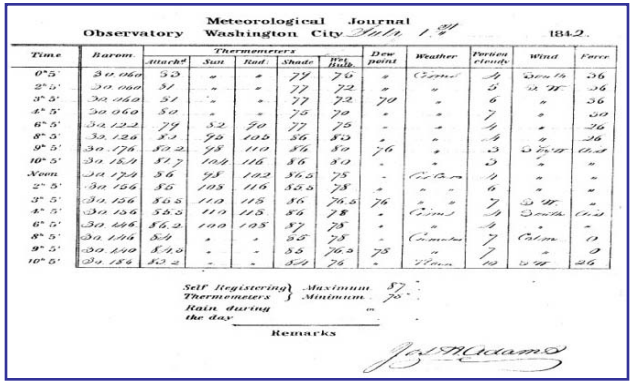
- Forecast Warning Analysis
- NWS Coop Observers
- Global Synoptic Reports
- NCEP Charts
- Ship, Buoy Reports
- Rocketsonde
- Radiosonde
- Storm Data
- Doppler Radar
- (GOES, POES, NPOESS, many other) Satellites
- Aircraft
- Profiler
- ASOS
- USCRN

Climate Database Modernization Program: 2000-2009

Over 11 terabytes of climate data now digitized

- 53 million weather and environmental images online
- Hundreds of millions of records digitized now online
- International data access and rescue activities
- 86 current NOAA climate/environmental rescue projects




Meteorological Journal
Observatory Washington City July 1st 1842.

Time	Barom.	Thermometers Attached	Sun	Rad.	Shade	Wet Bulb.	Dew point	Weather	Direction of wind	Force
0h 5'	30.060	53	"	"	77	76	"	Clear	4	36
2h 5'	30.060	51	"	"	77	72	"	"	6	36
3h 5'	30.060	51	"	"	77	72	70	"	6	36
4h 5'	30.060	50	"	"	75	70	"	"	7	50
6h 5'	30.122	79	52	70	77	75	"	"	4	36
8h 5'	30.120	80	75	105	86	85	"	"	4	36
9h 5'	30.120	82	95	110	96	80	76	"	5	Calm
10h 5'	30.120	87	109	115	88	80	"	"	5	"
Noon	30.120	86	95	102	86.5	75	"	Cloudy	4	"
2h 5'	30.156	86	105	116	85.5	78	"	"	6	"
3h 5'	30.156	86.5	110	115	86	76.5	76	"	7	"
4h 5'	30.156	85.5	110	115	86	78	"	Clear	4	Calm
6h 5'	30.446	86.2	100	105	87	78	"	"	4	"
8h 5'	30.146	84	"	"	85	78	"	Cloudy	7	Calm
9h 5'	30.240	84.2	"	"	85	76.5	75	"	7	"
10h 5'	30.186	83.2	"	"	82	76	"	Rain	10	26

Self Registering Thermometers { Maximum 87 / Minimum 75
Rain during the day
Remarks

July 1st, 1842 hourly weather data from Washington, DC, imaged and digitized through the CDMP Program

Keying and Imaging the data increases data accessibility and data integration- Work must be done by CDMP contractors in KY, MD, WV

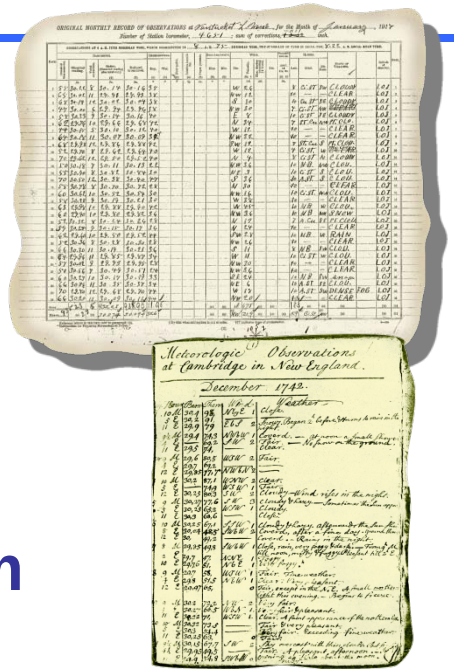
Imaged Records Example:
Glacial Pairs – Muir Glacier, Alaska

NCDC Non-Digital Data Archive

Manuscript / Autograph*

103 Million Pages stored in 120,000 boxes

* Located at Asheville; additional paper records located at the Federal Records Center in Georgia that will be inventoried and prioritized for digitization

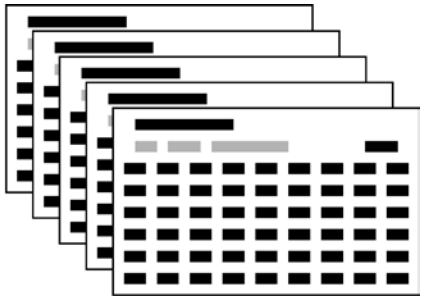


35mm & 16mm Film

125,129 Rolls

Microfiche

860K fiche containing 51 million pages



Percent digitized
(Keyed or imaged)

72%
(78 million)

1.7%
(2,105 reels)

10.0%
(86,000 fiche)

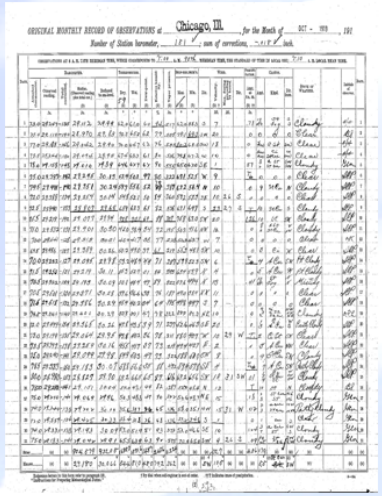
Climate Database Modernization Program

Climate Database Modernization Program (CDMP) Surface Airways Observations

SAO observations keyed through CDMP and added to NCDC's Integrated Surface Hourly (ISH) database:

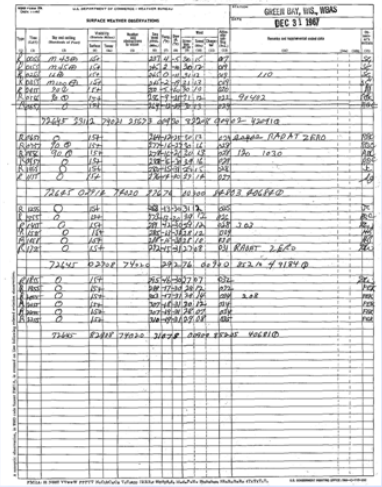
405.6 Million New Observations Keyed and Archived by the end of 2010

Surface airways meteorological data are being used for: engineering design (ice loads for towers, cables wires, wind loads for buildings, heating/cooling requirements, drainage/runoff extremes) aircraft operations (runway design), ship routing and oil rig placement, global re-analyses for climate trends assessment, HAZMAT operations and studies (oil spills, toxic release), weather risk management industry, insurance investigations and verification, court cases and criminal investigations, aircraft accident investigations, wind energy studies, commercial innovation and design, and tourism support.



Data Period 1891-1948
211 New Quasi Hourly
Stations Added

Data Period 1928-1948
261 New Hourly
Stations Added



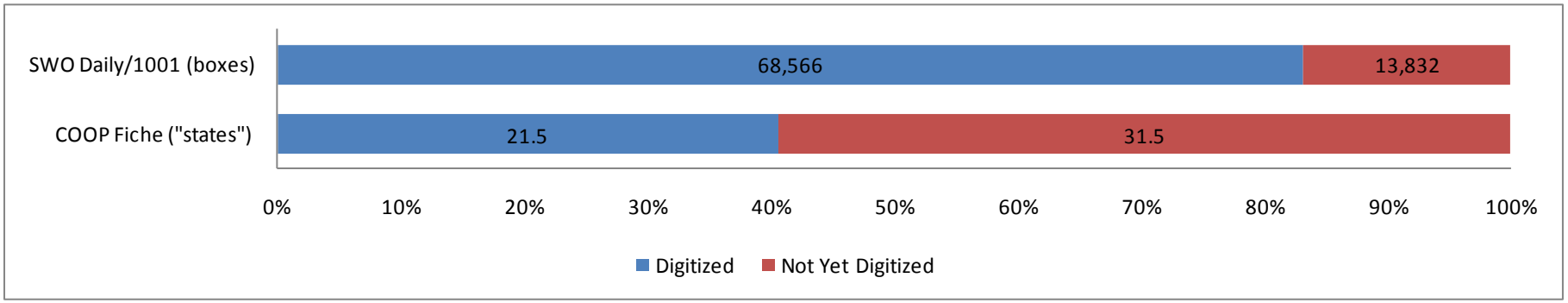
Data Period1965-1981
292 Hourly Stations
Updated

Weather instruments on the roof of the Wold-Chamberlain Field Administration Building around 1945 (Courtesy of the Minnesota Historical Society, Photograph Collection). Left photo: Ms. Lucille Sjostrom checking temperature and dew point sensors in the white shelter and the rain gage at far right while planes are taking off. Right photo: Ms. Sjostrom calculating cloud heights by using the rooftop ceilometer. Before the celometer was installed in 1945, cloud heights had to be determined by launching weather balloons.

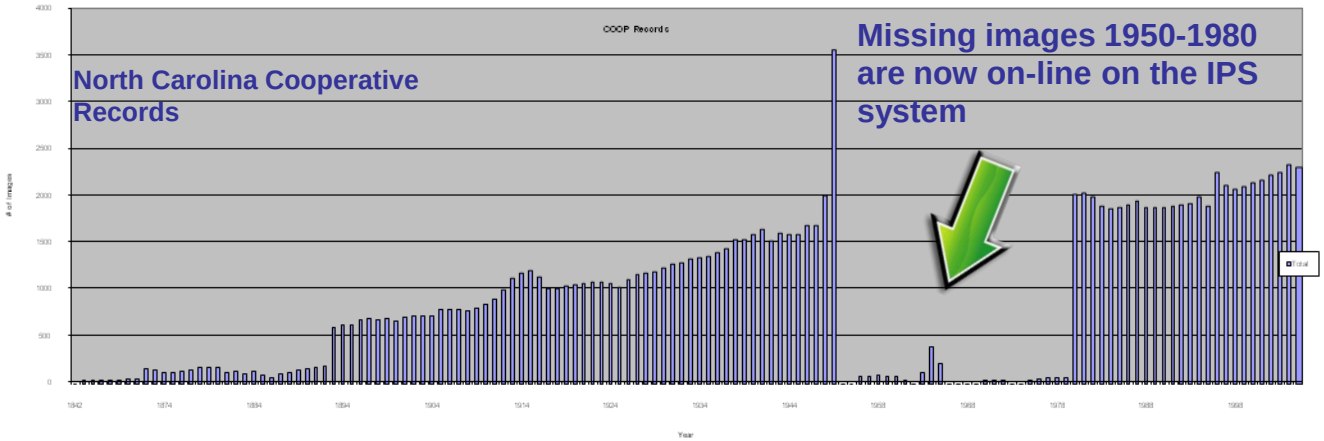
The National Weather Service in Lander, WY (1906)

National Weather Service at Greenville-Spartanburg AP

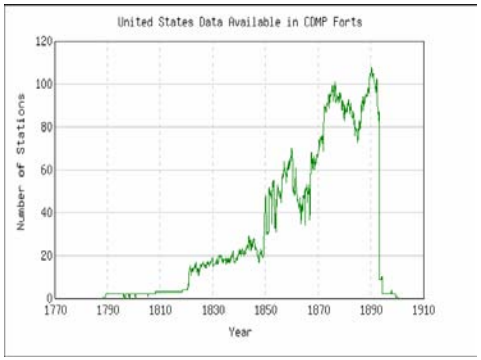
Climate Database Modernization Program



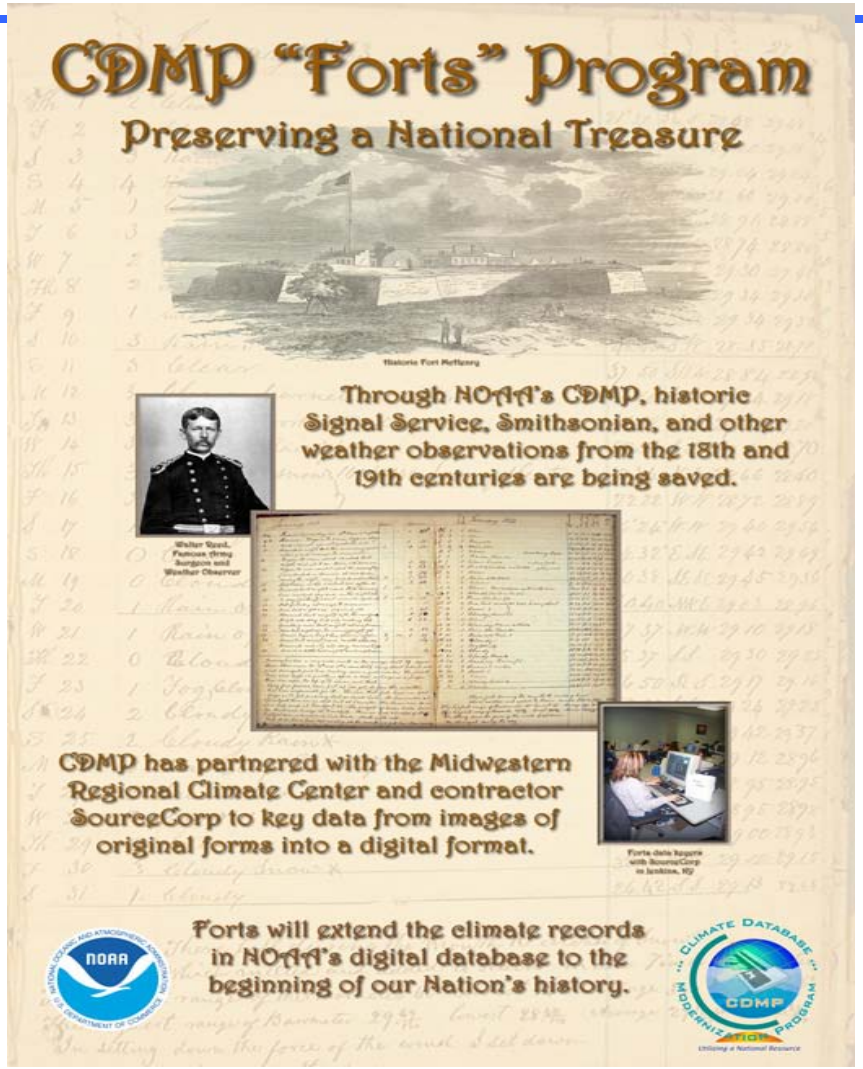
SWO estimated completion date: 2017
COOP Fiche estimated completion date: 2016

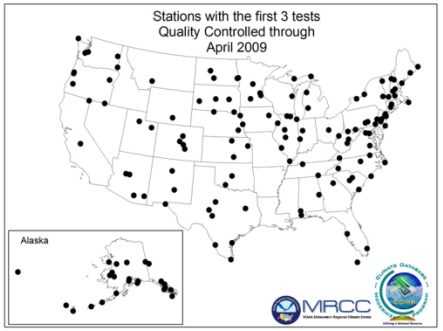


Climate Database Modernization Program



The CDMP “Forts” project is extending daily data records from the beginning of the Weather Bureau era (circa 1892) as far back as the 1780’s. Close to 350 stations’ data have already been keyed. CDMP’s Forts team will prepare approximately 75 more stations for keying in the upcoming year.

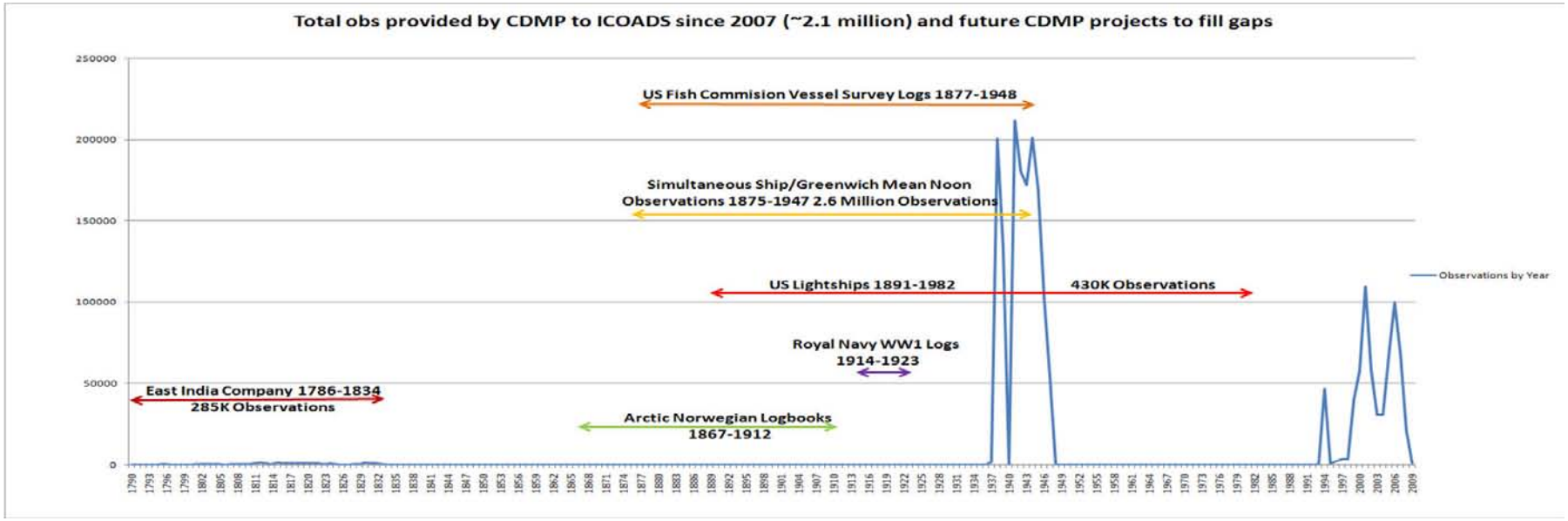




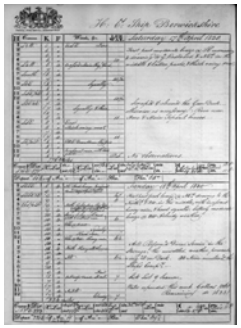
The keyed data for all the CDMP Forts stations are available online through the Midwestern Regional Climate Center (MRCC). In addition, close to 100 stations’ data have passed QC tests applied at MRCC. These data are available from NCDC via an FTP download.

Climate Database Modernization Program (CDMP)

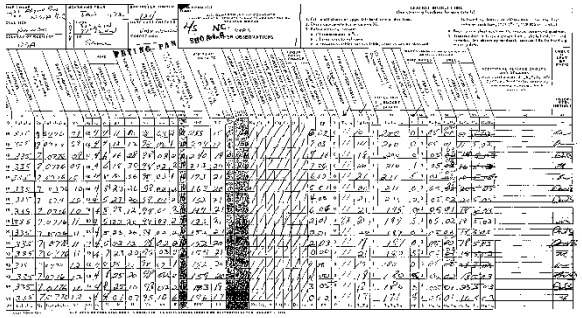
Sailing Ahead with Historical Marine Observations

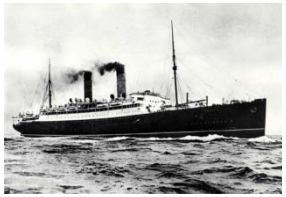


Current Rescue Projects:

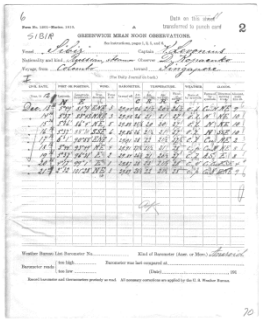


The East Indiaman *Warley* (1795), as depicted by Robert Salmon . Courtesy of the National Maritime Museum, London.





R.M.S. Laconia (1912) , courtesy of the Steamship Historical Society of America, Inc.



English East India Company Logbooks
- Period of Record: 1790-1834
- 285K Observations
- Digitization goal: 2009

Diamond Shoals Lightship LV 71, US Coast Guard

US Lightship Observations
- Period of Record: 1891-1982
- 430K Observations
- Digitization goal: 2009

Pollock Rip Lightship LV 114, US Coast Guard

Greenwich Mean Noon / Simultaneous Ship Observations
- Period of Record: 1874-1947
- 2.6 Million Observations
- Digitization goal: 2011

Climate Database Modernization Program

34 of 95 Observatories keyed (29 different formats)
-35 coop stations yet to be keyed. Total keying of 13.1 million daily observations (430,000 forms) should be completed by 2012
- approximately 1/3 of the data has been keyed. Data will used in international North American Drought monitoring activities with Canada and Mexico.

Daily data keyed for 30 stations covering 1890's -1920's. - total of 6092 station months. Data will be incorporated into GHCN

Hourly data for 16 stations in the 1950-1954 period. Data will be incorporated into ISD

The Foreign Data Library (FDL)

The best index we have for our "vast unknown" of foreign data:

Table 16
Detailed Listing of Unfilmed Foreign Data Publications Archived in ASB for Published Dates Prior to Mid-1975 and Costs for Producing Archival Quality Film from These Publications

Main Geographic Area Covered by Publications	Period	Pages	Volume	Cost BSHR & PC	Cost TDC
World	1841-1973	219,000	24.3	10,950	6,570
Tropic	1937-1970	14,400	1.6	720	432
Hemisphere	1743-1974	172,800	19.2	8,640	5,184
Oceans & Water Bodies	1648-1974	563,400	62.6	28,170	16,902
Europe Aisa	1797-1973	159,600	17.7	7,980	4,788
British Isles	1845-1975	939,300	101.0	46,965	28,179
Germany	1750-1975	1,382,700	153.6	69,135	41,481
Philippines	1348-1975	924,900	102.8	46,245	27,747
Sunda islands	1866-1974	117,600	13.1	5,880	3,528
General Australasia	1900-1969	7,200	0.8	360	216
New Zealand	1853-1975	400,200	44.5	20,010	12,006
Australia	1770-1974	351,000	39.0	17,550	10,530
New Guinea	1914-1964	5,700	0.6	285	171
Polynesia/Micronesia	1911-1975	223,500	24.8	11,175	6,705
Polar Regions	1873-1972	194,400	21.6	9,720	5,832
Unprocessed/Noncatalogued	Varies	750,000	83.3	37,500	22,500
TOTALS	1348-1975	25,216,000	2796.7	$1,260,800	$756,480

Appendix E - 10/75

2071 number of boxes of data in the FDL

CDMP multi-year project to inventory data suitable for keying in GHCN daily and monthly, IGRA upper air and ISD surface

Web interface inventory will be developed after inventory Is complete

Short-term Priorities, next few years

Climate Service Publications

Radar Summary

(from 1956)-40,304 reels

24-hour Precipitation

Snow Cover

Surface/Upper Air

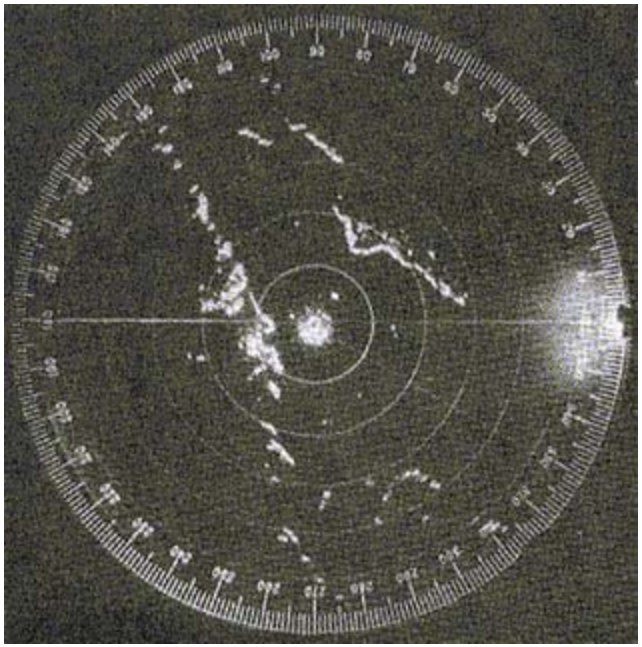
Hemispheric Constant Pressure

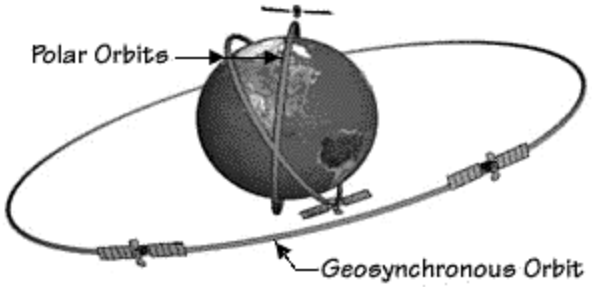
Thermographs

Barograms

Wind Gust Recorder Charts

Satellite Imagery-1300 boxes of raw images 1964-1990





Climate Database Modernization Program

4 NWS International Activities

Typical Camera and Imaging Setup for International Projects

A technical leader responsible for each step in the process at each international location is critical !

High tech digital cameras and camera stands are set up in a well lit environment- sponsored by NOAA/NWS

Technicians are trained to image the records using the camera equipment they check for quality, exposure and completeness

Digital jpeg images are stored in the camera's hard drive then transferred to the computer

Images on the computer are then written to CD-ROM or DVD and sent to NCDC for storage and keying

Keying format developed at NCDC based on data captured from host country

Data must be keyed in U.S. by CDMP contractors

End to end process can take 1-3 years depending on complexity and amount of data to be imaged/keyed

CDMP African Projects

- Over 150,000 images of pibal (upper air wind) records from the 1940's to 2003 received to date from 7 African countries (Kenya, Malawi, Mozambique, Niger, Senegal, Tanzania and Zambia)
- Most data has been keyed and after passing quality control checks will be entered into NOAA's global upper air database (IGRA)
- Digital data files were provided to the host countries that imaged the data. Keyed data files also hyperlinked to the actual images providing an easy access to the original record
- A small amount of pibal data remains to be keyed for Zambia and Mozambique- finished by mid 2009
- Ongoing tasks with Tanzania and Mozambique – may expand to surface data in 2009
- Martin Munkhondya in Malawi is the technical leader responsible for training and follow through visits at these international locations
- NWS and IEDRO (non profit) provides some technical, administrative and logistical support
- Possible Namibia and ACMAD Microfiche Recovery Project

Kenya – 5 sites

Senegal – 3 sites

Malawi – 7 sites

Mozambique – 2 sites

Tanzania – 2 sites

Zambia – 2 sites

Niger – 2 sites

Making Data User Friendly and Accessible

The index on the CD-ROM will be the main point for searching for related data.

The index page provides links to all available data types (both images of recorded data and actual keyed data) associated with the CD-ROM

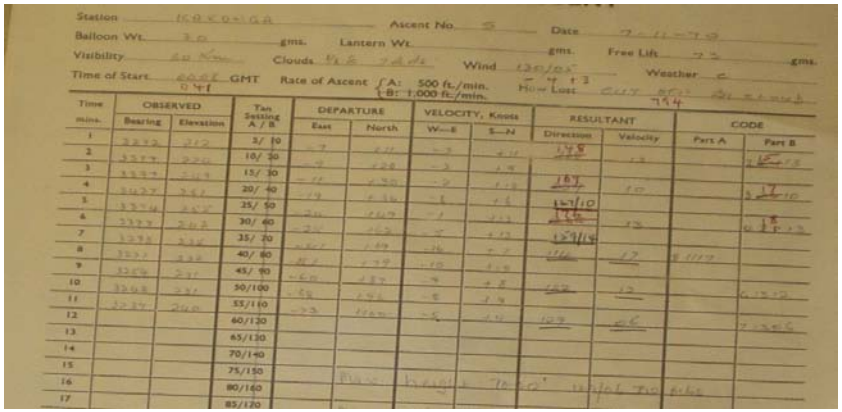
Station Number	Date	Time	Table	Dir/Spd	Raw Data	Image
67423	11/07/1970	0400	Table	Dir/Spd	Raw Data	Image
67423	12/21/1979	0400	Table	Dir/Spd	Raw Data	Image
67423	12/22/1979	0400	Table	Dir/Spd	Raw Data	Image
67423	12/24/1979	0400	Table	Dir/Spd	Raw Data	Image
67423	12/27/1979	0400	Table	Dir/Spd	Raw Data	Image
67423	12/29/1979	0400	Table	Dir/Spd	Raw Data	Image
67423	12/30/1979	0400	Table	Dir/Spd	Raw Data	Image

Station:67423 Day/Mo/Year Time:07/11/1970 04Z
Keyed Image ID: CDMP06MA\MA0001**0009.jpg**
Source Image ID: .\MA0001\1\P6160006.jpg

	TIME MINS	HGHT FEET	Azimuth DEG	Elev DEG	COMPUTED DIR DEG	COMPUTED SPD KTS	OBSERVED DIR DEG	OBSERVED SPD KTS
>	0	0					130.0	5.0
	1	500	327.2	21.2	147	13	0	0
	2	1000	337.9	22.4	170	12	0	0
	3	1500	239.7	24.9	165	8	0	0
	4	2000	342.7	26.1	174	9	0	0
	5	2500	337.4	25.5	140	12	0	0

Note: > Marks the Beginning of each Record in the Launch

The highlighted .jpg has a link connecting it to the original image from which the data was keyed



The data above is an upper air pibal, due to the limited wind data available a keying format was developed to key the azimuth/elevation data along with the surface wind data, found in the header section. The wind data, to the middle right of the image, we found, was often determined by the average of multiple levels of wind data.

Climate Database Modernization Program

International Activities

- WWII Royal Navy Ship logs from 1938-1947 were microfilmed and scanned at the British National Archives. The records have been keyed by CDMP and will be QA/QC'd then merged into the International Comprehensive Ocean Atmosphere Data Set (ICOADS).

•Expanded to East India Company Logbooks in 2008- Joint UK Met Office Project

Major NOAA Projects Sponsored by CDMP

National Climatic Data Center

Hourly Surface Observations: imaging and keying

Daily Cooperative Observations: imaging and keying

Upper-Air Observations: imaging and keying
Signal Service/Smithsonian Obs ("Forts"): keying

Hourly Precipitation Data: imaging and keying
Integrated inventory system development

Marine observations: keying

Mexican Daily/Hourly Data: imaging and keying
Vietnamese Daily/Hourly Data: keying

Monthly Weather Review: searchable indexing
Snotel Data: keying
East India Company Data: keying

Station History & Metadata development

Subscription Services

National Geophysical Data Center

Defense Meteorological Satellite Program film: imaging

Glacier Photos: imaging

Marine Geophysical Records: imaging and keying

Ionospheric Observations – keying

Historical Solar and Spectral Observations: imaging

Tsunami Event Gauge Records: imaging and keying
Historic International Polar Year: imaging
Marine/Lacustrine Record of Climate Change:
Heat Mapping Mission Data:
Historic Cosmic Ray Ionization Chamber Data
Historical International Polar Year: imaging

National Oceanographic Data Center

NOAA Library Rare Climate Publications: imaging

Lightship data: Sweden & Finland
NOAA 200th Anniversary Film Transfer: imaging
California Marine Ecosystems Survey: imaging

National Marine Fisheries Service

Lightship Observations: imaging and keying

Data Recovery on Cetaceans: imaging and keying

Fish egg & larvae: keying: REEF: optical scanning

Magnetic Tape recovery ;Historical plankton: keying

Historical Fish Landing Data: keying
Historic Bering Sea Crab Data: imaging and keying
Oral History Interviews: transcription and digitizing
Turtle Exclusion Data: imaging and keying

National Ocean Service

Shoreline Charts: vectorizing

Nautical Charts: imaging

Thunder Bay Historical Collections: imaging and keying

California Marine Ecosystem Survey: imaging and keying

Historical Maps and Nautical Charts: geolocation
Historic Environmental Sensitivity Maps: imaging
Fish Commission Historical Papers/Logbooks: imaging, keying
High/Low Water Level at NOS Sites: imaging, indexing, keying
Special Reports for Geographic Names: imaging
Historical Aerial Photography: imaging

National Weather Service

African Upper-Air Observations (Seven Nations): keying

Surface data from Tanzania, Mozambique: imaging and keying

Atlantic/Pacific tropical cyclone "storm wallets": imaging

Office of Oceanic and Atmospheric Research

U.S. Navy Weather Station Index Books – keying
Hurricane Reconnaissance: imaging & streaming video

European historical ship logbooks: imaging and keying

U.S. Regional Climate Centers

Database Conversion and Quality Control

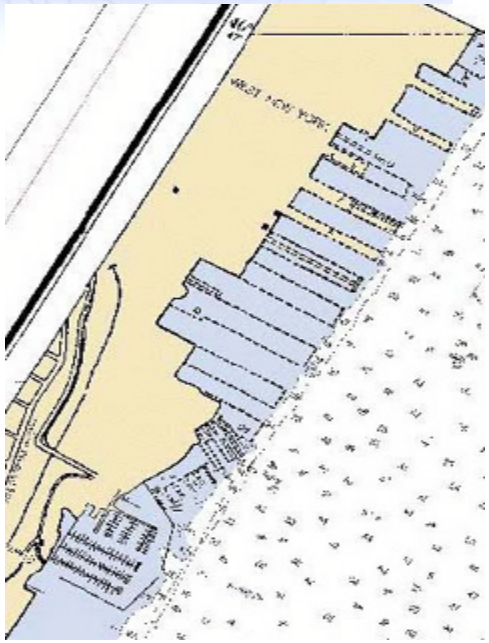
Climate Database Modernization Program

Highlights/Past Successes

2009 Major NOAA CDMP Data Recovery Tasks

18 NOS tasks

High-altitude aerial photography, Hudson River, NY.



Same area on a NOAA nautical chart. Comparing these sources, created at different times, provides information on the rate of change in the coastal zone, which aids in the design of coastal zone mapping projects.

Highlighted tasks: Image nautical charts & historical coast pilots, vectorize and geo-reference shoreline charts, and image and key water level gauge records and environmental sensitivity maps, water and tide level data, fishery management and catch tracking tasks

Climate Database Modernization Program

Highlights/Past Successes

2009 Major NOAA CDMP Data Recovery Tasks

5 NODC Tasks

- Rescue 3 collections of ecosystem surveys along California coast
  - Beach Watch Program
  - Common Murre Restoration Project
  - California Kelp Resources Project
- Scan ~110K survey slides and log sheets

Highlighted tasks: include California marine ecosystem surveys, NODC metadata, NOAA library and film transfer projects and plankton database research and rescue projects.

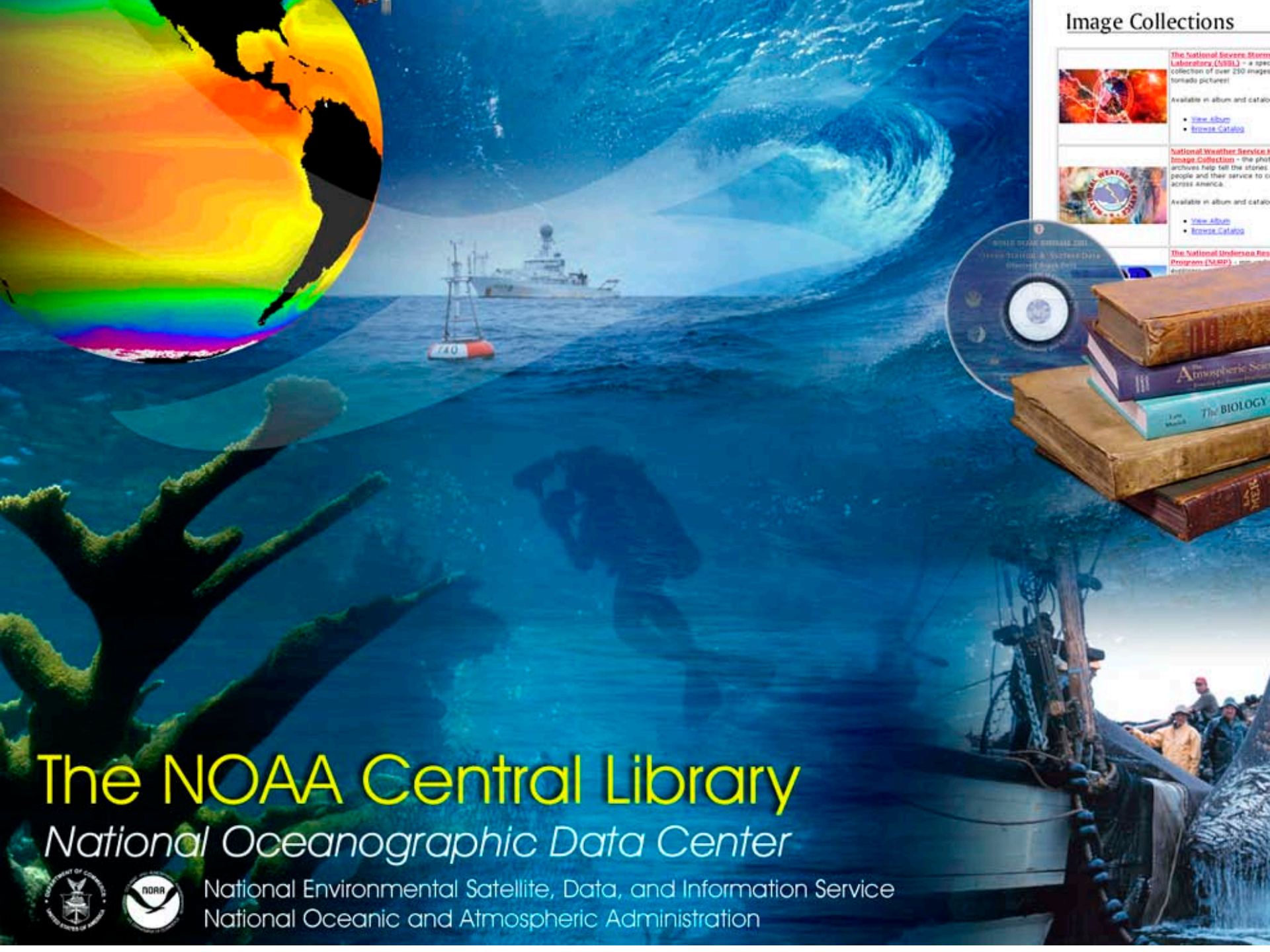


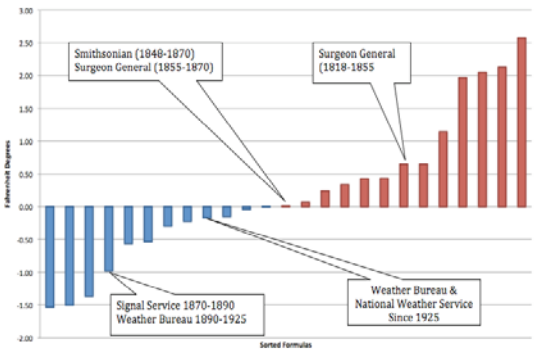
Image Collections
The National Severe Storms Laboratory (NSSL) - a spec
collection of over 250 images
tornado pictures!
Available in album and catalo
View Album
Browse Catalog
National Weather Service
Image Collection - the phot
archives help tell the stories
people and their service to
across America.
Available in album and catalo
View Album
Browse Catalog
The National Undersea Res
Program (NURP) -
The BIOLOGY
The NOAA Central Library
National Oceanographic Data Center
National Environmental Satellite, Data, and Information Service
National Oceanic and Atmospheric Administration

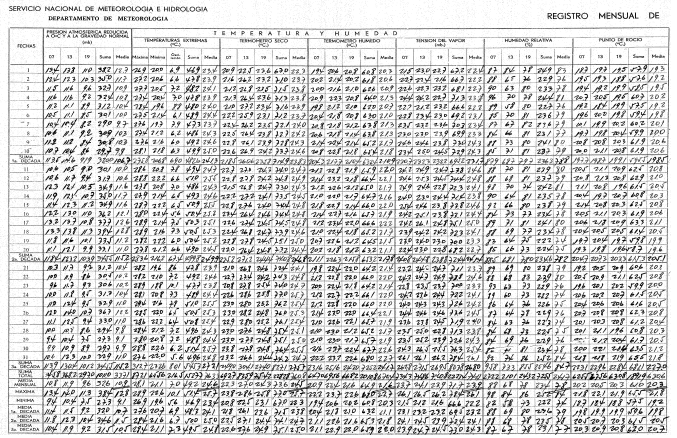
Climate Database Modernization Program

Highlights/Past Successes

2009 Major NOAA CDMP Data Recovery Tasks

4 OAR Tasks and Misc



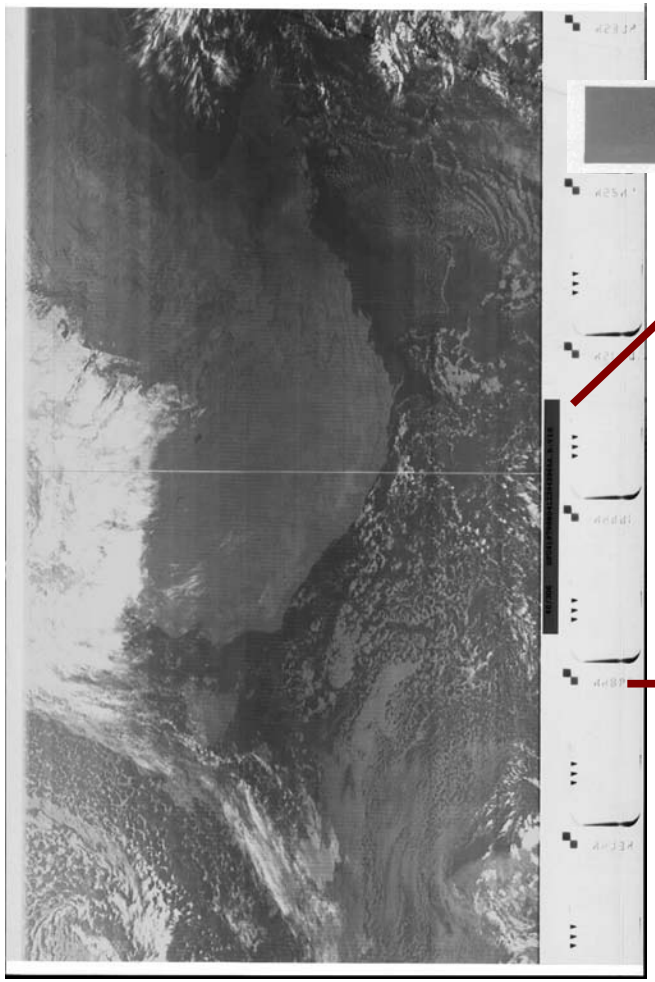


•Surface observations have been taken at Puerto Baquerizo Moreno (.9 S, 89.6 W) on Isla San Cristobal in Ecuador's Galapagos Islands since 1967. There are no stations within 1,000 km which regularly report surface data for this period. This station is located in the heart of the East Pacific Cold Tongue

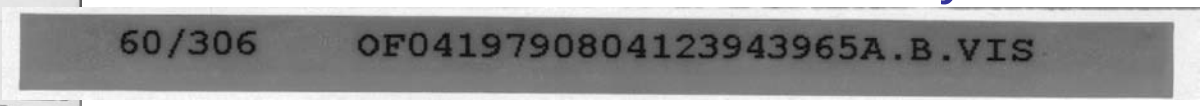
Write a reference document for climate researchers to: Describe each of 25 prescribed daily mean formulas, discuss how and why the formulas varied, explain the rationale for those variances, compare them to the true daily mean, identify correction factors for each formula, determine spatial variations in the corrections. Investigate correction factors for each formula, determine spatial variations in the corrections

Image and key historic European ship logbooks, hurricane reconnaissance information, San Cristobal keying and various publications

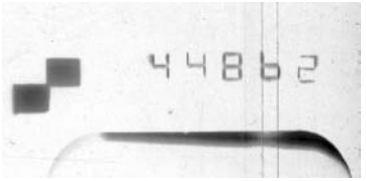
DMSP Sample Film Scan



Label with file name attached by HOV



F-4 August 4, 1979 12:39 GMT
Daytime Visible - Australia



Fiducial mark and number
(seconds during the day

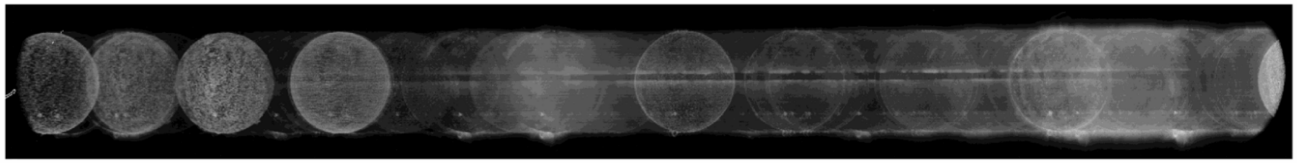
Glass Plate Scanning Project

Historical Solar Observations (L-16)

Scanning of the Naval Research Laboratory (NRL) Glass Plate Negatives from the Skylab Mission

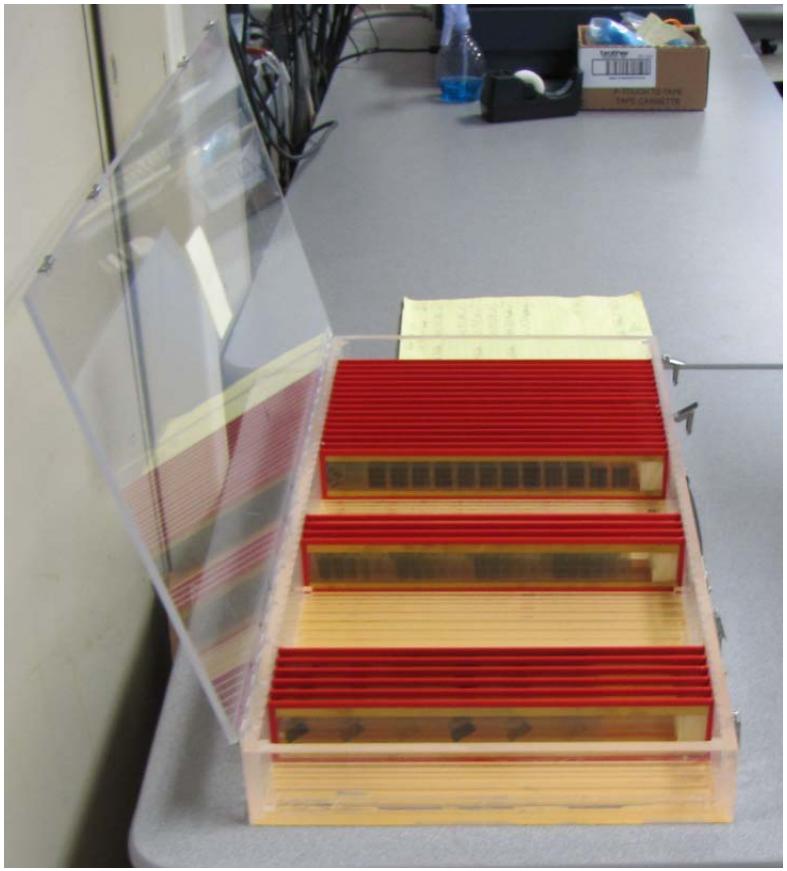
Resulting scans, (scanned at 3000 dpi grayscale)
Solar UV Spectra 8 per plate

Full disk Solar UV images



The glass plate negatives as they aged were a dataset at risk. The images stored on glass plate negatives at the Naval Research Archives were not readily accessible to the public. The NRL working in partnership with NGDC and the NCDC Climate Database Modernization Program team have successfully modernized and provided wider access to this valuable dataset.

Glass Plate Scanning Project

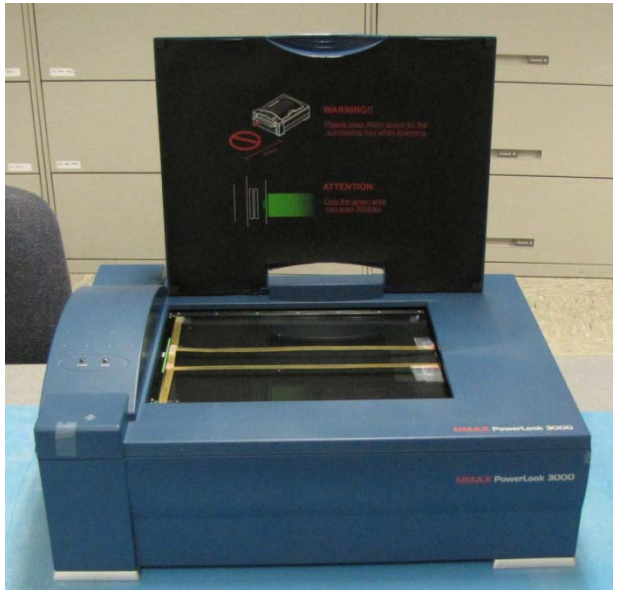


The glass plate negatives are stored in customized cases at the NRL. NRL shipped the glass plate negatives to HOVS, in Beltsville MD, for digitization.

The scanning operator selects the glass plate negative for scanning. Prior to scanning, dust is removed with a blower brush and a lint free cloth.

Glass Plate Scanning Project

The scanner, borrowed from the NRL has been modified for the scanning of glass plates negatives with two parallel gold bars across the scanning platen.

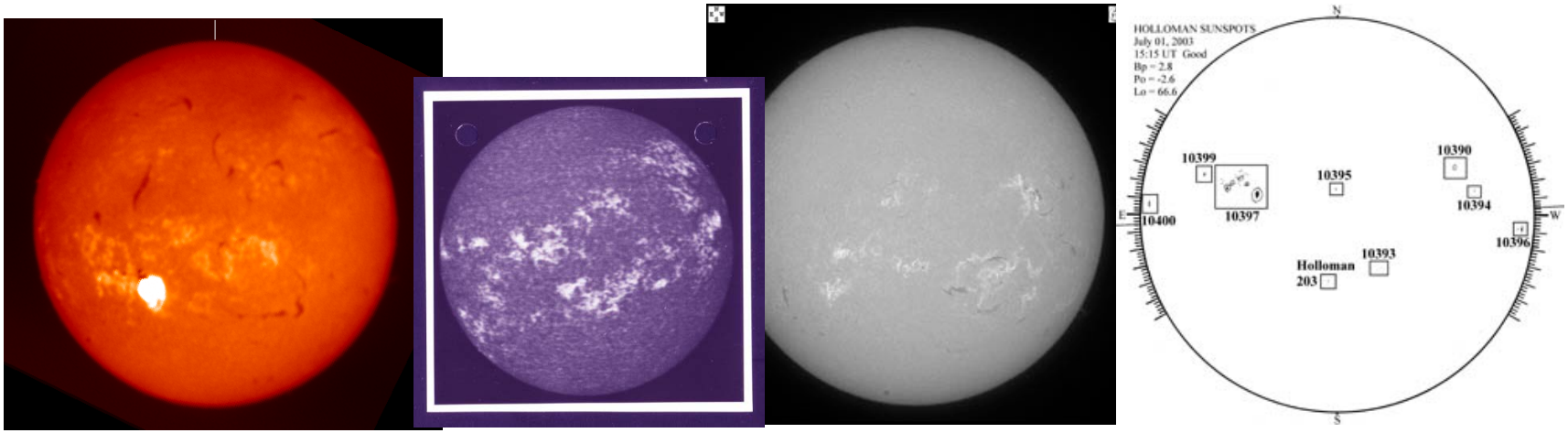


The glass plate negative is placed on the parallel gold bars. The bars raise the negative off the platen, reducing the chance of adding moiré patterns or Newton's rings as artifacts to the scanned image.

Moire pattern effect

Newton's rings effect

Solar CDMP Proposed FY07 Work



Focus on completing high resolution research quality scans

Complete scanning of 67 years of daily solar H-alpha images on film – 24,000 images

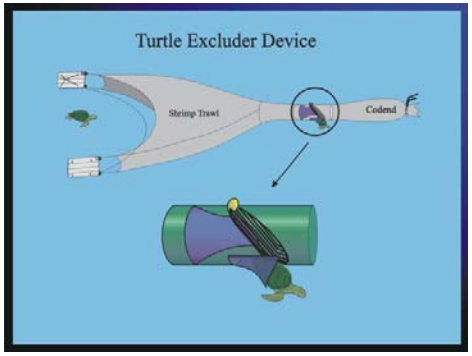
NEW **-- Scan 35 mm slides of historical NOAA Space Weather activities – about 300 NGDC slides from Helen Coffey for NOAA History website, to complement the SEC files.**

Climate Database Modernization Program

Highlights/Past Successes

2009 Major NOAA CDMP Data Recovery Tasks

11 NMFS Tasks



Bycatch Reduction Engineering Program to “provide information and outreach…that will encourage adoption and use of technologies

Imaging and keying data on cetaceans , fish eggs/population, coral reefs, Bering sea crab data, lightship records and Turtle Exclusion data

Selected NOAA Projects
Climate Database Modernization Program

Supports NOAA's Ecosystem and Climate goals

Digitize 7,200 negatives of killer, minke whales and other mammals

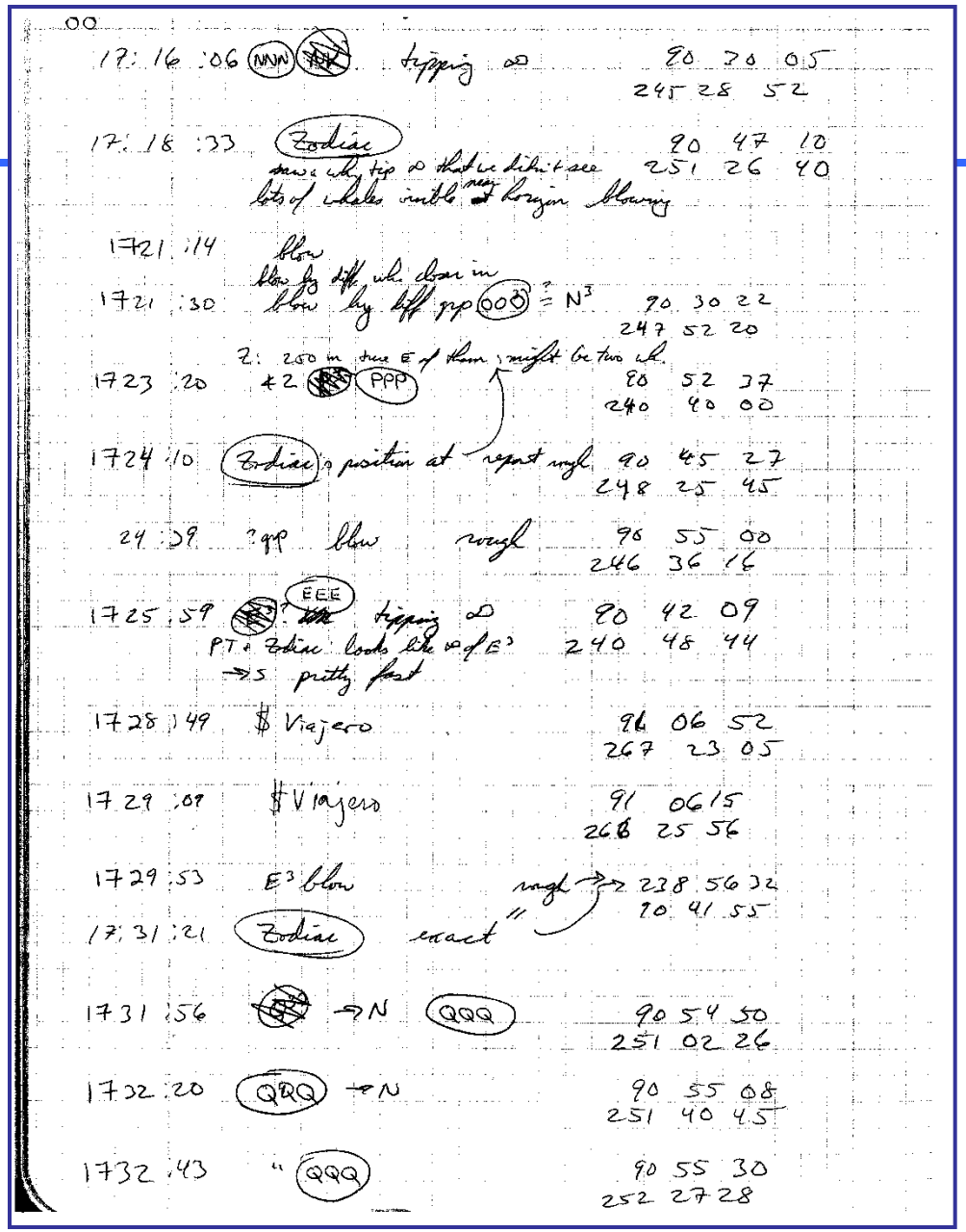
Scan 15,000 pages of notes

Keypunch 3,000,000 characters

May expand into capturing 750 hours of audio tapes collected over 30 years.

Supports research into the decline of the southern killer whale population- classified as depleted under the MMPA and could become listed under the ESA

Example of a messy page- Hawaiian Humpback Whale Sighting and Movement Data



COPEPOD: a global plankton database of zooplankton and phytoplankton data sampled from around the world.

COPEPOD

... the global plankton database ...

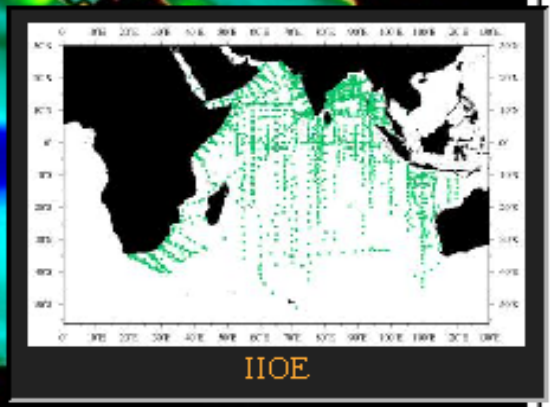
INTRODUCTION

ONLINE DATABASE

DATA SEARCH & RESCUE

"COPEPOD-2005"
a global plankton atlas

COLLABORATION



IIOE

COASTAL & OCEANIC PLANKTON ECOLOGY, PRODUCTION & OBSERVATION DATABASE

National Marine Fisheries Service - Science & Technology - Marine Ecosystems Division

[Introduction] [Online Database] [Data Products] [Collaboration]

www.st.nmfs.noaa.gov/plankton

Electronic Hurricane Wallet Project

Tropical Cyclone 'Storm Wallet' Electronic Archive

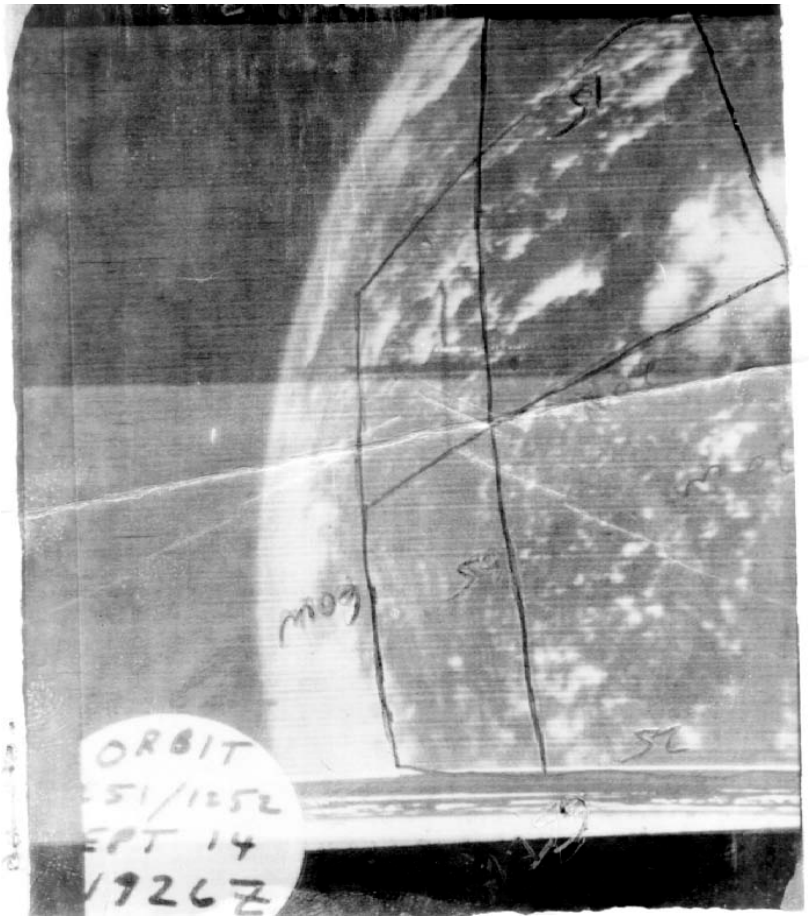
After the dissipation of every tropical cyclone occurring in the Atlantic and eastern north Pacific basins, all of the data and relevant materials related to that cyclone are collected by the NHC staff. The materials are placed in a "storm wallet" which currently takes the form of an expandable binder, or series of binders. These storm wallets have proven to be extremely useful in the post-analysis of many tropical cyclones, both near-term and in some cases, decades later.

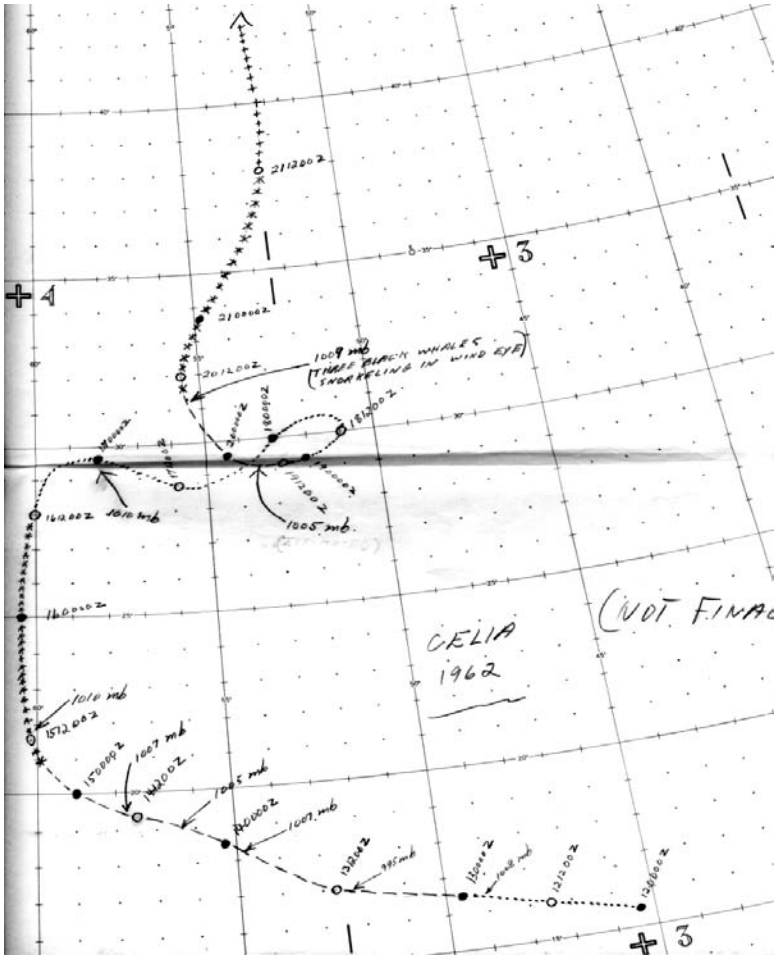
The procedure for storing this data dates back to well before the routine use of computers in the office environment. In the Atlantic, the wallet series begins in 1958 and proceeds continuously through the present. In the eastern north Pacific, wallets begin in 1988, the year in which operational responsibility for that basin was assumed by NHC.

NHC Central Pacific is developing the same “Storm Wallet” archive

Selected NOAA Projects
Climate Database Modernization Program

Hurricane Celia 1962- Hurricane Wallet Project





Electronic Hurricane Wallet Project
Hurricane Camille 1969

UNITED STATES GOVERNMENT

Memorandum

U.S. DEPARTMENT OF COMMERCE
WEATHER BUREAU

TO : Director, Southern Region

DATE: October 9, 1969

In reply refer to:

FROM : MIC, WBO, Galveston, Texas

SUBJECT: Reported 70 foot Seas with Hurricane Camille

At a recent oceanography meeting, Dr. James Sharp, secretary of Gulf Universities Research Corporation informed me that he had recieved a report of 70 foot seas in Camille. This information reached him from an offshore drilling employee, working with Gulf Measuring Project which is composed of several oil companies.

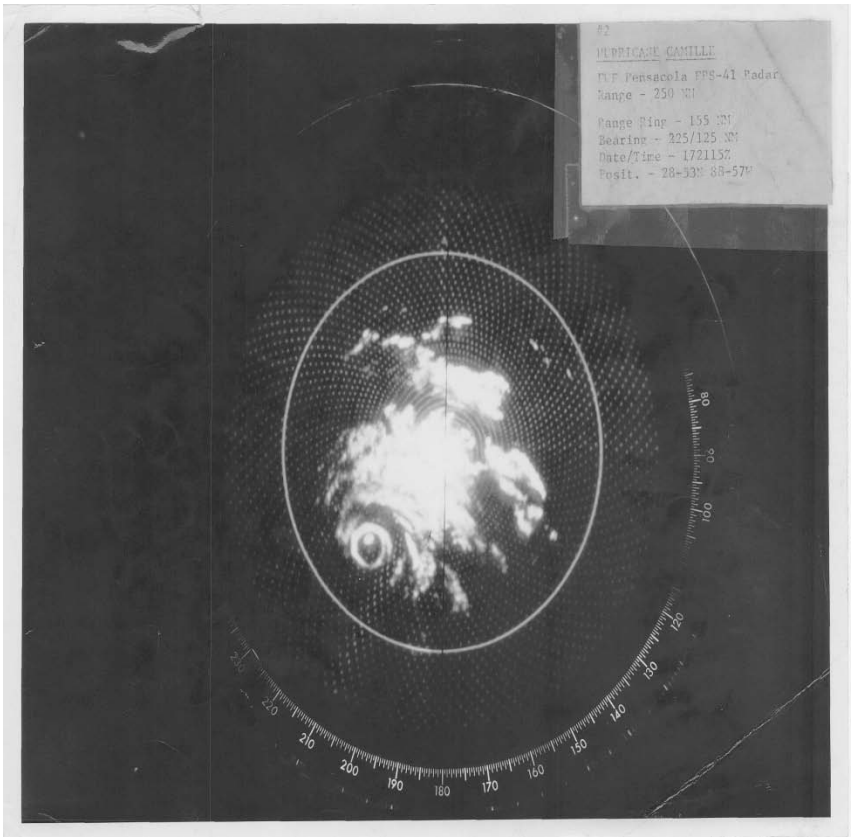
The exact location is not available but was near the track of Camille in 100 plus feet of water. He feels more information will be forthcoming and if additional details become available I will pass along.

It was reported the wave heights ranged from a minus 32 feet to a plus 38 feet. They lost their wind equipment when the wind reached 100 knots.

Again, I should emphasize this report has not been officially released but thought I would pass along for your information.

Davis Benton

BUY U.S. SAVINGS BONDS REGULARLY ON THE PAYROLL SAVINGS PLAN



Climate Database Modernization Program

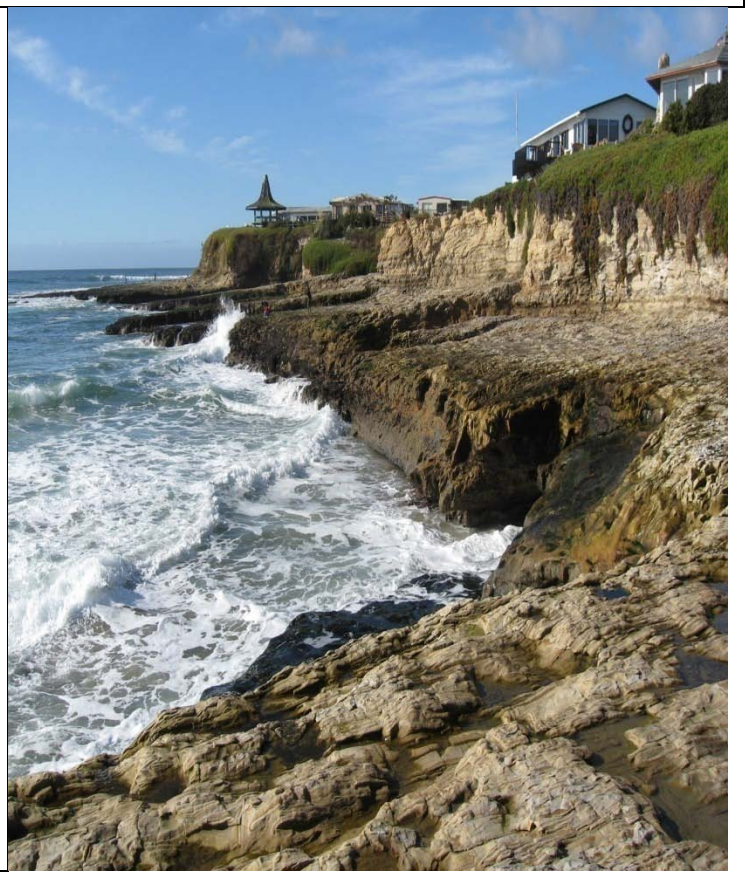
CDMP Proposal Process – NOAA Working Together on Data Rescue and Recovery

Proposals judged against the following criteria:

1. ***Supports NOAA's Strategic Goals***
2. ***Contribution to improved data access & rescue***
3. ***Value to climate community***
4. ***General merit to overall program***
5. ***Cost effectiveness***
6. ***Ease of digitization by the contractors***

Call for Papers- Issued Each July
Data Access Workshop – Held in November

59 Proposals were submitted and funded during FY 2009 –total of 86 NOAA projects – New Record !



Climate Database Modernization Program