The World Area Forecast System (WAFS) Internet File Service (WIFS) Users Guide

By

WAFC Washington

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Document Change History

Date	Version	Description[1]
24-Feb-10	1.0	Initial draft release.
26-Mar-10	1.1	Incorporated user feedback including: new document change history section, correction to Table 2 GRIB/GRIB2 description, additional descriptions where necessary, section heading changes, and more.
30-Mar-10	1.2	Based on feedback from reviewers, made some changes to the User Authentication fields.
5-Apr-10	1.2	Based on feedback from reviewers, added "WAFC Washington" wording to title, footer, and the Introduction.
26-Apr-10	1.2	Based on feedback from reviewers: (1) section 2 was renamed "Service Overview and Responsibilities of U.S. Government Agencies", (2) section 3 was renamed "Data Retrieval Process", (3) backup information was added to section 4, (4) section 7 "Responsibilities of U.S. Government Agencies" was renamed "WIFS Customer Support" and is now section 8, and (5) more information was added to the WIFS Customer Support section including information on a trouble ticket system.
20-May-10	1.3	Based on technical interchange with customers, the GRIB data is now being served in a concatenated file format. The description of the file formats in Section 6 reflects this change. Based on feedback from reviewers: (1) Appendix A was added to describe the Gnu Wget utility, (2) Section 3 was modified to include a reference for Appendix, (3) minor changes were made in Section 4 to clarify back-up roles and responsibilities, and (4) Section 4.2 title was modified.
15-Jul-10	2.0	Folded in the contents of the WIFS Interface Control Document; added Appendix B, Reference Documents; expanded the Gnu Wget description in Appendix A; updated Section 3 Data Retrieval Process; added Appendix C WIFS Registration; changed link to software providers in Section 3; reorganized Section 4 based on reviewer comments; added new Section 4.3 Suspension of Access; added note to Section 5 that mentions potential harmonization of directory structures.
26-Aug-10	2.1	Changed WIFS help desk phone number.
1-Nov-10	3.0	Completed Draft Interim Version: • Added introductory information • Reorder sections for logical flow • Added Chapter 2, WIFS Products and Data
4-Jan-11	3.1	Added verbiage on authorization criteria. Updated document after review of v3.0
14-Jan-11	4.0	Document baselined after final reviews

[1] Minor corrections and cosmetic changes are not recorded.

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1 Introduction

Established in 1982, the objective of the World Area Forecast System (WAFS) system is to supply meteorological authorities and other users with forecasts of en-route meteorological conditions in digital form. This objective is achieved through a comprehensive, integrated worldwide, and, as far as is practicable, uniform system and in a cost-effective manner, taking advantage of evolving technologies. One result of evolving technology is the implementation of the WAFS Internet File Service (WIFS) which replaces the International Satellite Communication System (ISCS).

WIFS is provided by the Washington World Area Forecast Center (WAFC). The Washington WAFC is operated by the United States National Weather Service (NWS) and WIFS is an integral part of the NWS's Consolidated Aviation Web Services (CAWS) system, used for the purpose of providing WAFS products and related services as defined by the International Civil Aviation Organization (ICAO) Annex 3.

WIFS is in compliance with ICAO Document 9855 Guidelines on the Use of the Public Internet for Aeronautical Applications, and the associated Federal Aviation Administration (FAA) Advisory Circular 00-62 Internet Communications of Aviation Weather and Notices to Airmen (NOTAMs) dated November 1, 2002 that enables WIFS to support the dissemination of WAFS and related products via the Internet in accordance with ICAO Annex 10.

WIFS supplies the same meteorological products as those currently broadcast by ISCS. Such products include upper wind, upper-air temperature, upper-air humidity, direction, speed and height of maximum wind, tropopause height and temperature, and forecast significant weather phenomena.

1.1 Reference Documents

1.1.1 International Standards

- International Standard ISO 8802-2: 1998 Part 2: Logical Link Control
- WMO Publication 306 Manual on Codes
- WMO Publication 386 Manual on the Global Telecommunications System
- WMO Publication FM92 GRIB Edition 1
- WMO Publication FM92 GRIB Edition 2
- WMO Publication FM94 BUFR
- ISO/IEC 15444-1:2004, JPEG 2000 Compression
- Annex 3 to the Convention on International Civil Aviation, Meteorological Services for International Navigation.
- Annex 10 to the Convention on International Civil Aviation , Aeronautical Telecommunications
- International Civil Aviation Organization Document 9855 Guidelines on the Use of the Public Internet for Aeronautical Applications

1.1.2 U.S. Government Standards

- Federal Aviation Administration Advisory Circular 00-62 Internet Communications of Aviation Weather and NOTAMS, November 1, 2002

1.1.3 Industry Standards

- Institute of Electrical and Electronics Engineers (IEEE) 802.3: Ethernet Local Area Network Specification
- GNU Free Documentation License (http://www.gnu.org/software/wget/manual/wget.html#GNU-Free-Documentation-License)
- GNU Wget 1.12 Manual (http://www.gnu.org/software/wget/manual/wget.html)
- RFC 791: Internet Protocol (IP)
- RFC 793: Transmission Control Protocol (TCP)
- W3C Portable Network Graphics (PNG) Specification (Second Edition)

2 Service Overview and Responsibilities of U.S. Government Agencies

WIFS is a real-time data repository integrated within the CAWS system and accessible via the Internet to authorized users. For the purposes of adhering to the guidelines in ICAO Document 9855 Guidelines on the Use of the Public Internet for Aeronautical Applications and FAA Advisory Circular 00-62 requirements, the system is certified as a Qualified Internet Communications Provider (QICP)

The FAA, as the U.S. Meteorological Authority, identifies requirements for the products and services provided by the Washington WAFC. The National Oceanic and Atmospheric Administration (NOAA) NWS is the service provider of WAFS products and has responsibility for the management and operation of WIFS.

3 Products and Data Available on WIFS

3.1 Overview of Initial Service

WIFS provides access to WAFS data and products that are currently broadcast over ISCS. Information hosted on WIFS as defined in ICAO Annex 3, Meteorological Service for International Air Navigation, Chapter 3. These products are provided in the following divided into two groups:

- Grid Point information in gridded binary (GRIB1 and GRIB2) formats
- Significant Weather (SIGWX) in BUFR and PNG formats
- Alphanumeric OPMET information required for pre-flight planning

The required areas, flight levels, and forecast times for aeronautical meteorological products are defined in Regional Air Navigation agreements, and listed in the applicable regional ICAO Air Navigation Plan.

3.2 Grid Point Data

WIFS provides upper-air gridded forecasts in two formats, GRIB1 and GRIB2. GRIB1 is the format that has been used for many years. Due to a need to expand the data sets and increase the resolution, ICAO approved the use of GRIB2 for encoding WAFS data sets. GRIB2 offers significant advantages over GRIB1 including increased self-description, flexibility, and expandability. In addition, GRIB2 supports more compression schemes, including JPEG 2000 which is the scheme used by NCEP and used in the GRIB2 products on WIFS.

Note that GRIB1 data is scheduled to be terminated in 2013 in accordance with the long term plan of the World Area Forecast System Operations Group (WAFSOPSG). Users are encouraged to periodically check the WAFSOPSG bulletin board for changes in operations and policy.

Users receiving this data must have a data processing system, such as the WAFS workstation, which can read, decode, and manipulate data for the user's specific purpose. WAFS products prepared in GRIB1 and GRIB2 format are transmitted as a series of bulletins. Each bulletin contains a grid point field of one parameter at a single level. The individual bulletins are concatenated together according to the valid forecast hour before being made available on WIFS. Section 6.2 describes the naming convention for these concatenated data files.

3.2.1 GRIB1 Data

GRIB1 data is prepared by WAFC Washington and coded in the WAFS thinned GRIB format. The globe is divided into eight octants, four each in the Northern and Southern Hemispheres. Each segment is 90° in length, starting either side of the 30° W meridian, covering the Equator to each Pole. Decoding software available from WAFC Washington enables the information to be interpolated and presented on a regular latitude/longitude grid.

Gridded forecasts are prepared four times daily, valid at 6, 12, 18, 24, 30 and 36 hours after synoptic data time (0000, 0600, 1200, and 1800 UTC). Forecasts are made available for transmission as soon as technically feasible, but no later than six (6) hours after the standard time of observation.

3.2.2 GRIB2 Data

The same data sets are available in GRIB2 as are in GRIB1 (e.g., wind, temperature, humidity, etc). In addition, Cumulonimbus (CB) Clouds, Turbulence, and Icing forecasts, are also available on a trial basis and only reside on WIFS. To obtain more information users should refer to the final report of the Fifth Meeting of the WAFS Operations Group (WAFSOPSG):

http://www2.icao.int/en/anb/met-aim/met/wafsopsg/Pages/default.aspx

Notable GRIB2 Characteristics:

- GRIB 2 grid will be regular 1.25 x 1.25 degree (unthinned).
- New vertical levels at 350 hPa (~FL270), 275 hPa (~FL320) and 225 hPa (~FL360), applicable to wind, temperature and geopotential height fields.
- New vertical levels in the trial forecasts at 800 hPa (~FL060) for Icing; and 350 hPa (~FL270) for Clear Air Turbulence (CAT).
- CAT files have turbulence (%) for levels 150-400 hPa in 50 hPa increments.
- The Icing files have icing (%) from 300-800 hPa in 100 hPa increments.
- Eliminates use of octants and issues GRIB 2 data as a global field of data for each element.
- In Cloud Turbulence (ICT) is combined layer cloud and convective cloud turbulence
- ICT files have turbulence (%) from 300-700 hPa in 100 hPa increments.
- Tropopause Height limit of FL530 in UK GRIB1 to be changed to FL600 in GRIB2. Reference levels to tropopause height for GRIB1 and GRIB2 for WAFC Washington are different. Users should refer to the WAFS Change Notice Board for further information.
- Issuance times:
    - 4 issues per day, with DT 00, 06, 12 and 18 UTC.
    - 11 time steps at 3 hourly intervals T+6 to T+36.
- Data Points:
    - 27,576 GRIB 1 global data points with thinned “quasi-regular” grid (i.e. 3447 data points per octant).
    - 41,760 GRIB 2 global data points with regular (unthinned) 1.25 x 1.25 degree grid
    - Approximately a 50% increase in the number of global data points over present thinned GRIB 1 (27,576 increases to 41,760).

- Bulletins:
  - GRIB 1 bulletin is ~4 KB per octant, to 1st approximation (i.e. 2352 bulletins totals, for forecast hours from 00 – 72, ~38 MB)
  - GRIB 2 bulletin is approximately 6 KB per octant (roughly a 50% increase).
  - GRIB 2 bulletins range from 20 KB - 70 KB in size containing global field of data.
  - 1078 GRIB 2 bulletins (671 standard bulletins and 405 trial bulletins) per run containing global field of data.
- Data volume
  - Data volume is ~35 MB per run before compression (671 bulletins ~25 MB and 407 bulletins ~10 MB).
  - Although there are more data points and higher resolution of GRIB2 over GRIB1, the data volume is roughly the same due to better compression algorithms used for GRIB2.

Detailed information concerning upper-air gridded forecasts can be found in ICAO Annex 3, Appendix 2.

3.3 Significant Weather PNG Charts

SIGWX forecasts supplied in a Portable Network Graphics (PNG) format are issued four (4) times daily, and are valid at 0000, 0600, 1200, and 1800 UTC for the areas of coverage. The SIGWX forecasts include the elements listed in Annex 3, Appendix 2, 1.3.3.

3.4 Significant Weather BUFR Files

SIGWX forecasts are issued using Binary Universal Form for the Representation of meteorological data (BUFR) code form follow the specifications included in WMO Publication No. 306, Manual on Codes, Volume I.2, Part B – Binary Codes. Forecasts of SIGWX prepared by WAFC Washington are issued four times daily, valid at 0000, 0600, 1200, and 1800 UTC. BUFR is a standard binary format approved by the WMO for efficient storage of meteorological features. To produce a BUFR file, two elements are needed: a raw data file and a set of tables containing descriptors. When raw data is encoded, each data value is attached to a descriptor defining what the data represents. The decoding process reads the BUFR file, looks up the descriptor in the relevant table, and writes out the information in the proper format. Binary

BUFR files contain a set of tables with descriptors. Descriptors must be decoded from a set of common tables on the local machine in order to understand what the values represent. To this end, BUFR messages are very small and machine independent. They can be understood and decoded by any BUFR decoder having the latest tables available.

SIGWX data in BUFR format is independent of the background or projection. Only the information describing the feature is encoded. For example, a CLOUD area is a list of points with the height of bases and tops, and cloud type and amount attributes attached. There are no rules on how the cloud area should be drawn, or how the attributes are displayed. On SIGWX charts this is shown as a box, sometimes with an arrow to the area, but this information is determined by the graphical display program.

BUFR does not provide information on how to visually represent data. However, the WAFCs have written guidance on representation, which can be found on the WAFS Operations Group web page link:

http://www2.icao.int/en/anb/met-aim/met/wafsopsg/Pages/GuidanceMaterial.aspx

3.5 OPMET Data

OPMET information includes Routine Aviation Weather Reports (METAR), Special Routine Aviation Weather Reports (SPECI), Terminal Aerodrome Forecasts (TAF), Significant Meteorological Information (SIGMET) and special Air-reports (AIREPs). Volcanic Ash Advisory (VAA) and Tropical Cyclone Advisory (TCA) messages are also available on WIFS.

3.6 Administrative Messages

WIFS maintains a folder for the following types of administrative messages:

Table 3-1 Administrative Message Types

WMO Header	Description
NOUS42 KWNO	An NWS administrative message that discusses any major impacts to NWS communications and provides relevant info on numeric models that could affect the WAFC.
FXUS65 KWBC and FXUK65 EGGR	These are used by the WAFCs to alert users to corrections to the WAFC charts
NOXX10 KWBC	Used for ISCS administrative messages until June 2012
NOXX10 KKCI	A new WMO ID for WIFS administrative messages

3.7 Annexes to the User Guide

OPMET, forecasts and data products that are available to users on WIFS can be found in Annexes 1 through 4.

- Annex 1 — FASID Table MET 2A — OPMET information (METAR, SPECI and TAF) available on WIFS servers
- Annex 2 — OPMET information available on WIFS servers — listed in terms of aerodromes/location indicators and States
- Annex 3 — OPMET information available on the WIFS servers — listed in terms of bulletin numbers and location indicators of aerodromes contained in each bulletin

- Annex 4 — WAFS forecasts available on WIFS servers

All of these Annexes can be accessed under the *Guidance Materials* section of the SADIS Operations Group web-site:

http://www2.icao.int/en/anb/met-aim/met/sadisopsg/Pages/default.aspx

If an OPMET product is listed as being available under Annex 1 but cannot be found within the OPMET data files in WIFS, send an email to wifs.admin@noaa.gov to report the issue.

4 User Authorization

WIFS is not an open system and requires all users to be authorized for access. Authorization is granted (or denied) as part of the WIFS Registration process by the Washington WAFC Provider State's Meteorological Authority, the FAA.

The main criteria for approval is that there is some type of understanding that the company or person requesting access is providing direct support to an operator in support of flight planning for international operations, and that they should fall into one of the following categories:

- An existing ISCS user
- WAFS Vendor
- State MET Authority
- State National Meteorological & Hydrologic Service Provider
- International Operator and U.S. Flag carriers (domestic and international)
- Vendor listed as Enhanced Weather Information Systems (EWINS)
- Any Vendor identified in OPS SPEC in support of meteorological services for an airline

4.1 WIFS Registration

Users must complete and submit a form online at http://aviationweather.gov/wifs. Once the WIFS approving official authorizes access, the Washington WAFC will issue a user name and password which will be required to access the data.

For those States that deploy multiple WIFS workstation it is strongly recommended that each be registered separately. Figure 4-1 shows a snapshot of the current WIFS Registration Form available on the WIFS home page. The form should be completed and submitted online. Figure 4-2 shows a snapshot of the screen that will be seen upon successful form submission.

4.2 WIFS Password Policy

The current password policy is that the password does not expire. Users may request a password change by submitting an updated Registration request, and adding an applicable comment in the *Comments (Other Information)* field.

It should be noted, however, that the U.S. Department of Commerce may require NOAA/NWS to change this password policy such that WIFS users will be required to change their password periodically. If such a policy comes into effect, users will be provided with an automated mechanism to renew their password, and this document will be updated accordingly.

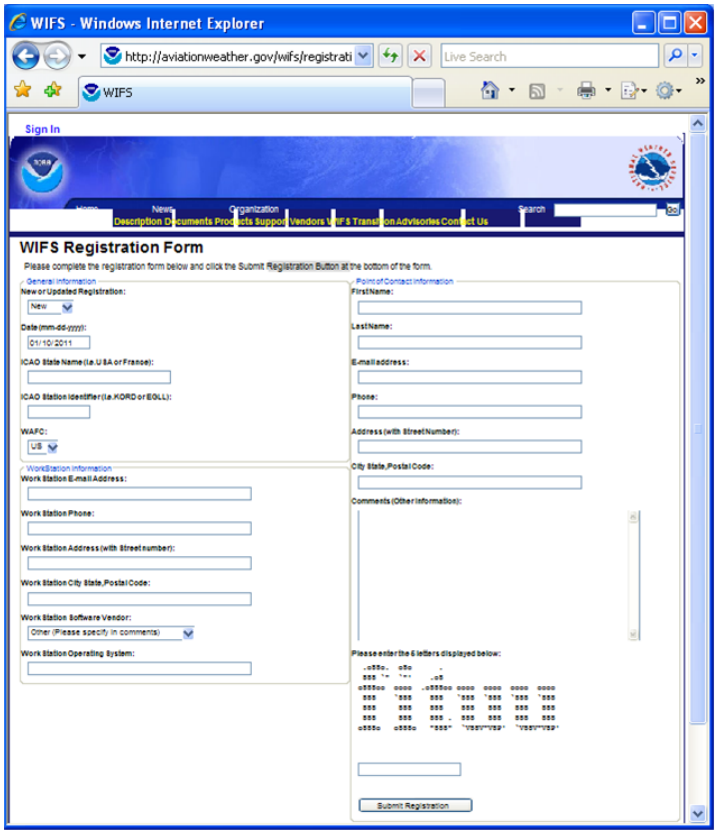

Figure 4-1 WIFS Online Registration Form

Figure 4-2 WIFS Registration Confirmation Screen

4.3 Access to Alternate WAFC Operations

WIFS users can request access to SADIS FTP services as a back-up means to obtain WAFS products as a contingency plan in the unlikely event of a catastrophic WIFS outage. However, SADIS FTP services are not available as a *primary* means of obtaining WAFS data to WIFS users, or future users whose primary WAFS provider is designated as Washington WAFC. Unless there is a major WIFS outage, SADIS FTP will not provide 'continuous', 'high volume' data supply to those WIFS users who are using SADIS FTP as a backup/contingency.

Similarly, SADIS (2G or FTP) users can request access to WIFS as a *back-up* means to obtain WAFS products, as a contingency plan in the unlikely event of a catastrophic SADIS outage. However, WIFS is not available as a *primary* means of obtaining WAFS data to SADIS users, or future users whose primary WAFS provider is designated as London WAFC. Unless there is a major SADIS outage, WIFS will not provide 'continuous', 'high volume' data supply to those SADIS users who are using WIFS as a backup/contingency.

SADIS users can request access to WIFS by filling out the online registration form as called out in Section 4.1 above.

WIFS users who wish to arrange a contingency account on SADIS FTP should contact the SADIS Manager (Chris Tyson) at the UK Met Office directly (chris.tyson@metoffice.gov.uk).

4.4 Suspension of Access

WIFS access may be suspended by the WIFS approving authority for unauthorized use of WIFS. Access to SADIS and WIFS as back-up services may be suspended by the WIFS and SADIS approving authorities if user's primary WIFS or SADIS accounts are suspended.

5 Data Retrieval Process

WIFS hosts WAFS and OPMET products on file servers located within multiple web farms. WIFS does not deliver ("push") data to the user but requires the user to collect ("pull") data off the file servers. User access to the WIFS files servers is by a Secure Hypertext Transfer Protocol (HTTPS) session over the Internet. Files can then be downloaded across this secure connection using browser or script-based tools. Users are encouraged to use the Gnu Wget designed to retrieve content from web-based file servers. More information about Gnu Wget can be found in Appendix A.

The minimum recommended Internet connection speed is 64 kbps, bursting to 512 kbps. Once the data is retrieved from WIFS, users will need software that is capable of processing and displaying WAFS data. A list of WAFS software providers can be found on the *Vendors* page at http://aviationweather.gov/wifs. Users should contact specific providers for cost and availability.

To evenly distribute the load amongst multiple web farms, CAWS uses a globally load balanced URL (https://aviationweather.gov/wifs/data). However, owing to network latencies, there are unavoidable differences between the file modification times at each of the three sites. If a client system relies on the file modification time, they may be better served going to a single farm thereby bypassing the load balancer. Users that choose to bypass the load balancer and go to a specific farm are asked to access data from their ***designated primary*** web farm.

The primary web farm assigned for each user depends on the first letter in the State name based on the U.S. English spelling. In the event the primary farm is inaccessible, users should employ a round robin approach, attempting to retrieve the data from the other two farms. The web farm URLs and primary web farm assignments are shown in Table 5-1.

Table 5-1 WIFS Primary URL for HTTPS Access

Web Farm Location	State Assignment (First Letter of State Name[1])	Base WIFS URL[2]
NWS National Headquarters	A, B, C, D, E , F, G, H, I,	https://hq.aviationweather.gov/wifs/data
NWS Southern Region Headquarters	J, K. L, M, N, O, P, Q, R, S	https://srh.aviationweather.gov/wifs/data
NWS Central Region Headquarters	T, U, V, W, X, Y, Z	https://crh.aviationweather.gov/wifs/data

[1] State name spelling in U.S. English.

[2] Specific data is stored in separate subdirectories, see Figure 6-1 WIFS Directory Structure.

6 WIFS Directory Structure and File Formats

Figure 6-1 depicts the WIFS directory structure and the names of the individual folders, with respect to the base URL (e.g., https://aviationweather.gov/wifs/data).

Note: At the time of this writing the directory structure is under review by the FAA and the NWS as there is a possibility of further harmonization of products between WIFS and SADIS.

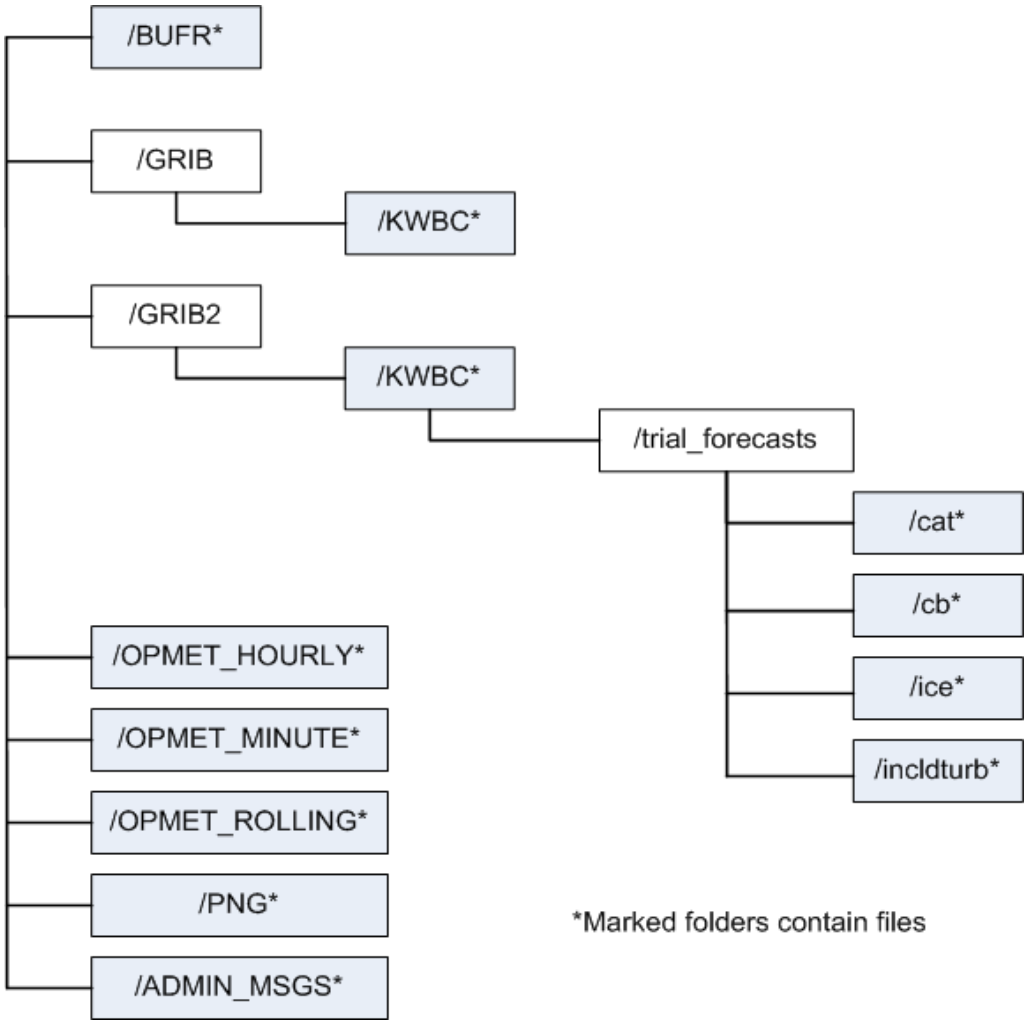

Figure 6-1 WIFS Directory Structure

6.1 BUFR Files

The BUFR files are generated every 6 hours and the WIFS BUFR folder contains the past 36 hours of SIGWX forecasts in BUFR format. Figure 6-2 is an example of the files that can be found in this folder.

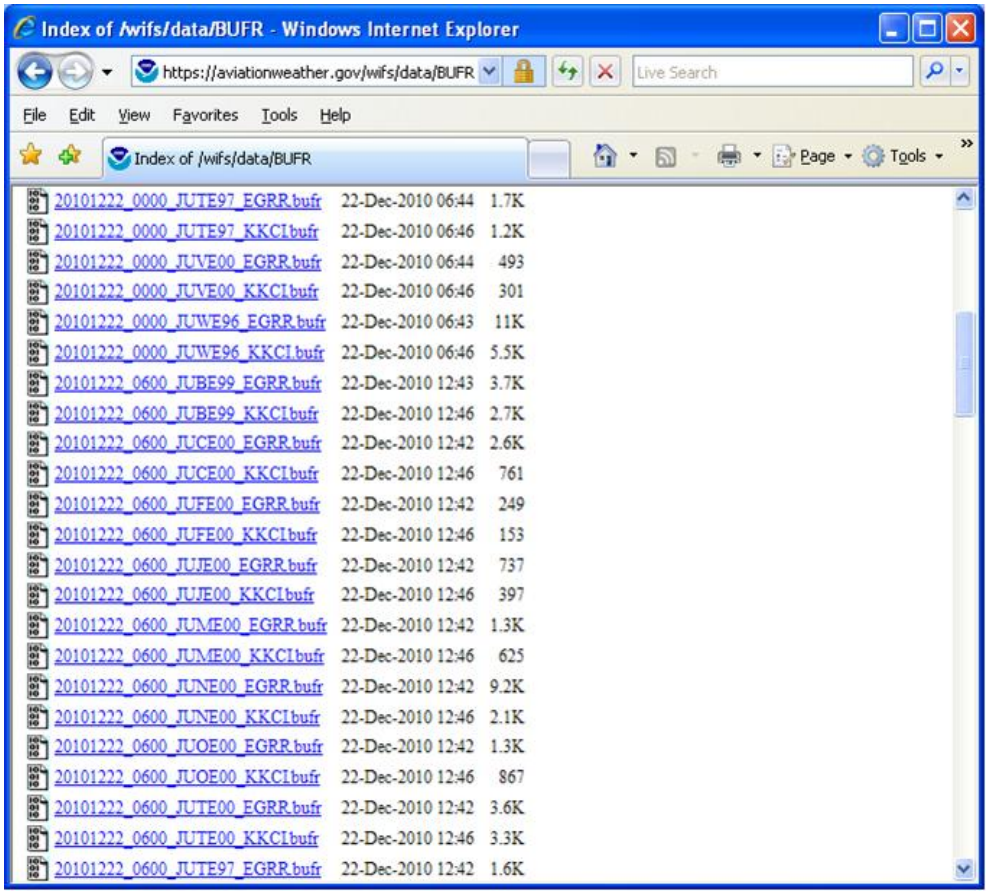

Figure 6-2 Snapshot of the BUFR folder

The file naming convention for these files is:

YYYYMMDD_HH00_TTAAii_CCCC.bufr where

YYYY	=	4-digit year
MM	=	2-digit month
DD	=	2-digit day
HH	=	2-digit hour of forecast package valid time
00	=	Fixed characters
TTAAii_CCCC	=	WMO header and site identifier
.bufr	=	File extension

6.1.1 Format of BUFR Files

For details on the format of the BUFR products see WMO Publication FM94 BUFR.

6.2 GRIB1 and GRIB2

Both GRIB1 and GRIB2 files are generated every 6 hours and both the GRIB and GRIB2 folders contain the past 18 hours of these forecasts where they are concatenated together according to the forecast valid time. Figure 6-3 and Figure 6-4 depict an example of the files that can be found under the respective GRIB and GRIB2 folders.

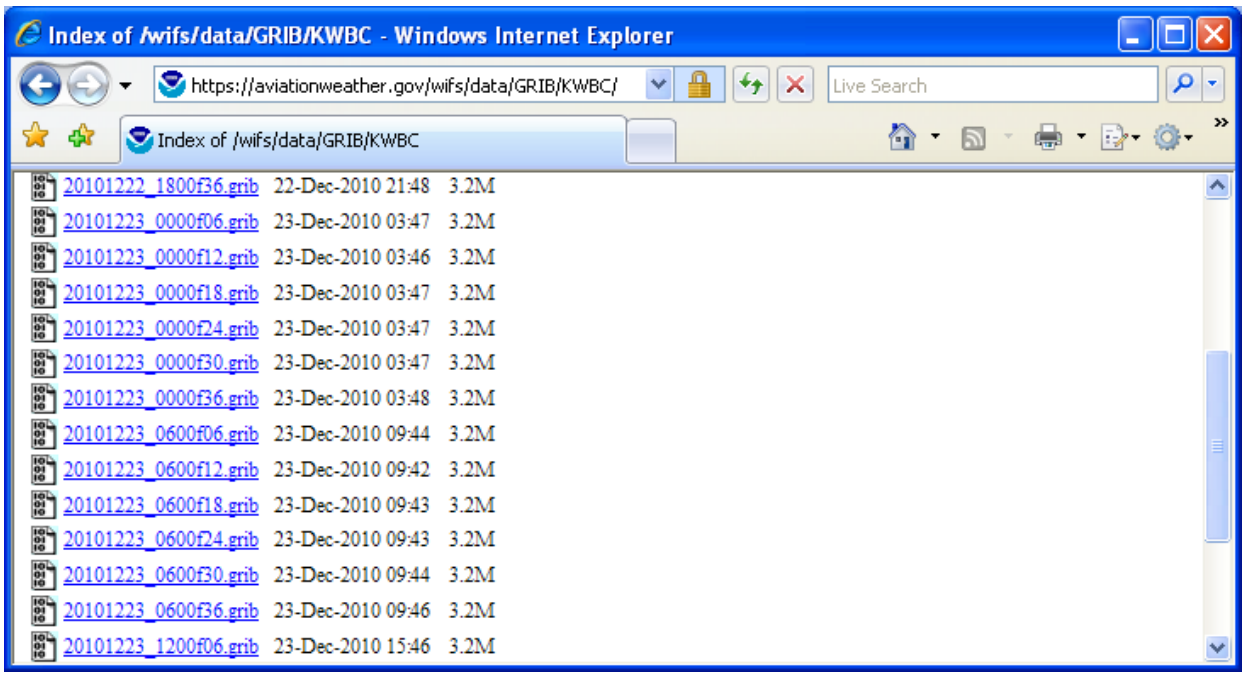

Figure 6-3 Snapshot of GRIB folder

The file naming convention for GRIB Edition 1 files is:

YYYYMMDD_HHfFF.grib where

YYYY	=	4-digit year
MM	=	2-digit month
DD	=	2-digit day
HH	=	2-digit hour of model run
f	=	Fixed character
FF	=	2-digit forecast hour
.grib	=	File extension

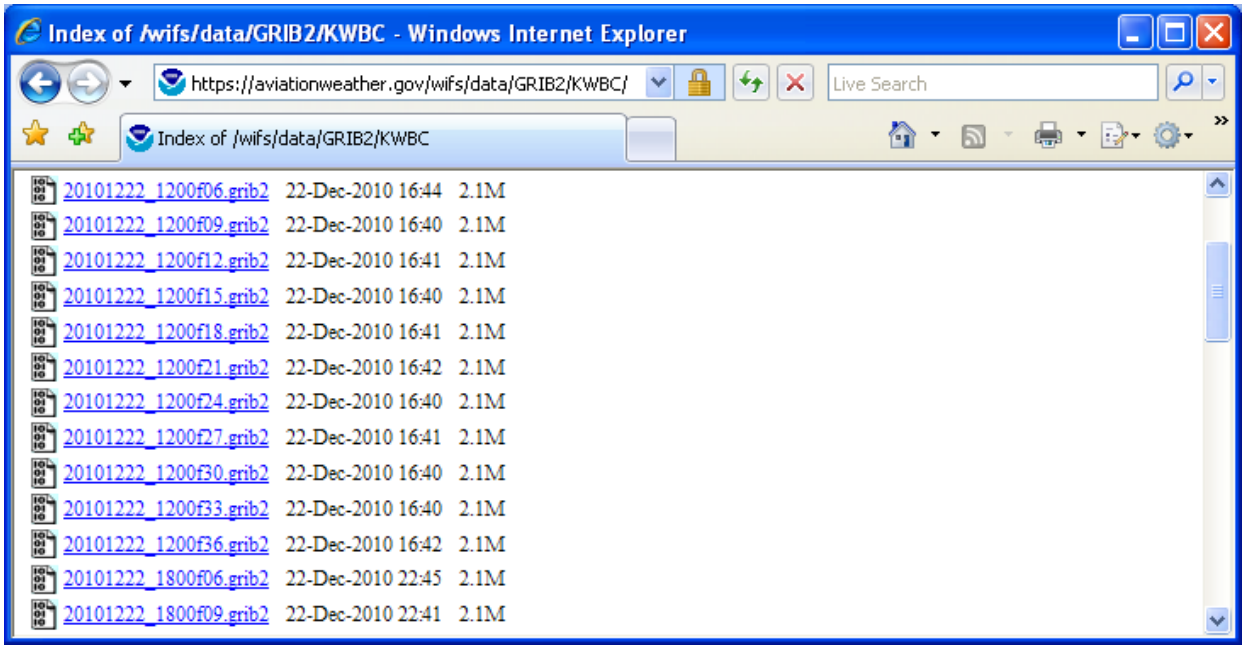

Figure 6-4 Snapshot of the GRIB2 folder

The file naming convention for GRIB Edition 2 files is:

YYYYMMDD_HHfFF.grib2 where

YYYY	=	4-digit year
MM	=	2-digit month
DD	=	2-digit day
HH	=	2-digit hour of model run
f	=	Fixed character
FF	=	2-digit forecast hour
.grib2	=	File extension

6.2.1 Format of GRIB Files

The GRIB files are formatted in accordance with WMO code FM 92 -IX Ext., and are described in full detail in "WMO Manual on Codes, Volume I, Part B (WMO No. 306).

Software libraries to decode data in GRIB data is provided by the National Centers for environmental Prediction (NCEP), and can be found at:

GRIB1 - http://www.nco.ncep.noaa.gov/pmb/codes/GRIB1/

GRIB2 - http://www.nco.ncep.noaa.gov/pmb/codes/GRIB2/

6.3 OPMET Data Files

The WIFS servers provide OPMET data (METARs/SPECIs, TAFs, SIGMETs, Advisories, Air Reports, NOTAMs, ASHTAMs) in character-oriented format, and this data is made available based on the following criteria:

- By the Hour
- By the Minute
- Rolling timeframes of the last 5, 30 and 60 minutes

6.3.1 OPMET-HOURLY

Each file within this folder contains all OPMET data that was received by NWS during a given hour. 36 hours of data are continuously maintained, and every hour a new file is generated from the most recent hour's data, and the oldest file is removed from the WIFS server. Figure 6-5 depicts a snapshot of the files maintained in this folder.

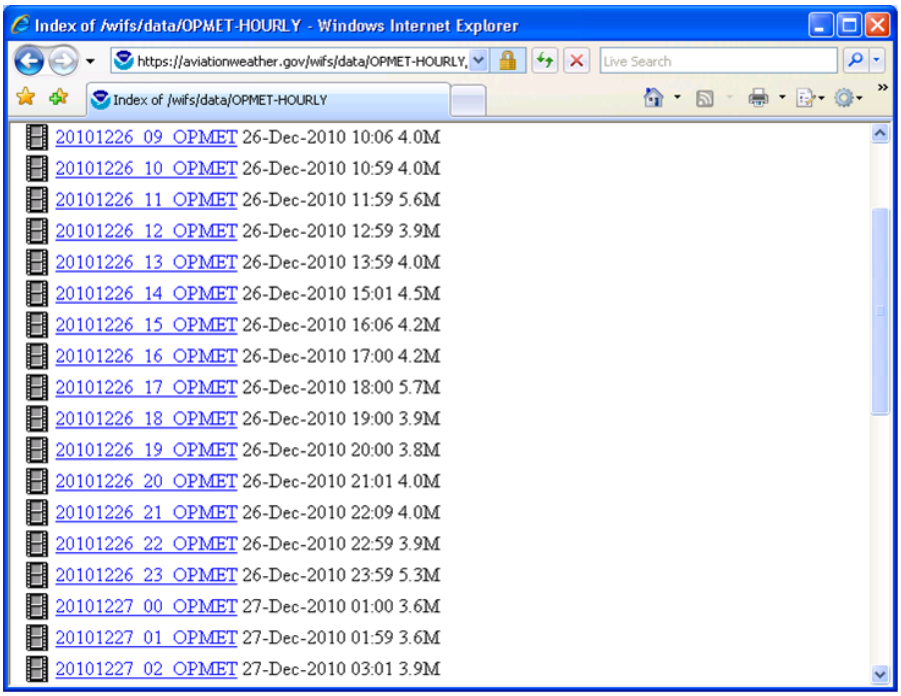

Figure 6-5 Snapshot of the OPMET-Hourly Folder

The file naming convention for OPMET-HOURLY files is:

YYYYMMDD_hh_OPMET where

YYYY	=	4-digit year
MM	=	2-digit month
DD	=	2-digit day
hh	=	2-digit start hour of collected data
OPMET	=	Fixed text

6.3.2 OPMET-MINUTE

Each file within this folder contains all OPMET data that was received by NWS during a given minute. Thirty-six (36) hours of data are continuously maintained, and every minute a new file is generated from the most recent hour's data, and the oldest file is removed from the WIFS server. Figure 6-6 depicts a snapshot of the files maintained in this folder.

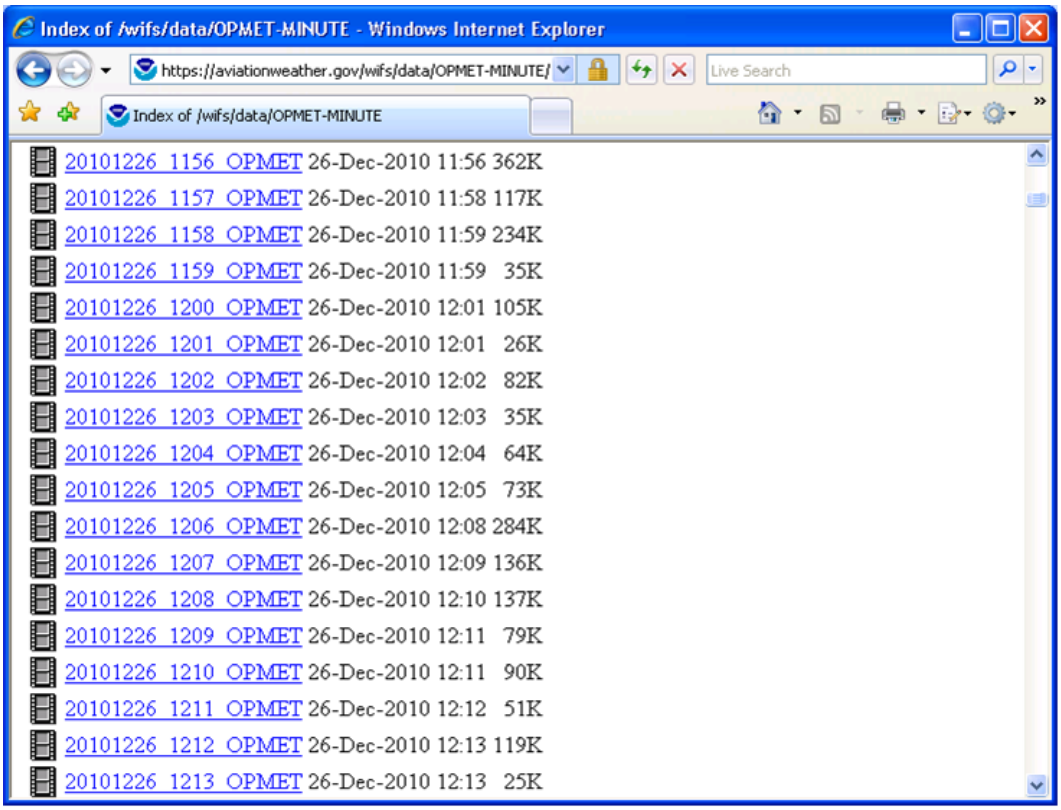

Figure 6-6 Snapshot of the OPMET-MINUTE folder

The file naming convention for OPMET-MINUTE files is:

YYYYMMDD_hhmm_OPMET where

YYYY	=	4-digit year
MM	=	2-digit month
DD	=	2-digit day
hh	=	2-digit start hour of collected data
mm	=	2-digit start minute within the hh hour of collected data
OPMET	=	Fixed text

6.3.3 OPMET-ROLLING

There are four individual OPMET data files within this folder that are generated from the OPMET_MINUTE files, and are in a format that was requested by the WIFS vendors.

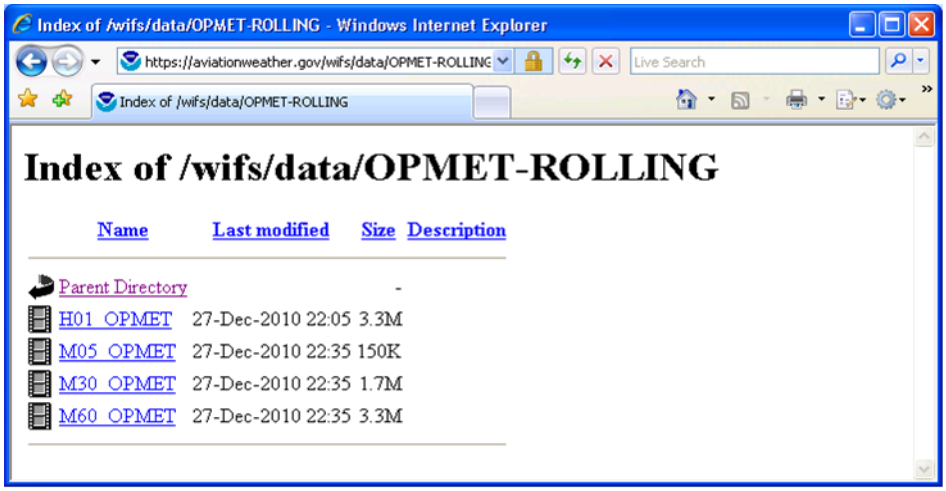

Figure 6-7 Snapshot of the OPMET-ROLLING folder

- The M05_OPMET file is re-created every minute and concatenates the contents of the last 5 OPMET MINUTE files. (i.e., at the top of minute 23, the M05 file is created from the OPMET_MINUTE files from minute 18 through minute 22.)
- The M30_OPMET file is re-created every minute and concatenates the contents of the last 30 OPMET MINUTE files. (i.e., at the top of minute 23, the M30 file is created from the OPMET_MINUTE files from the prior hour minute 53, through the current hour minute 22.)
- The M60_OPMET file is re-created every minute and concatenates the contents of the last 60 OPMET MINUTE files. (i.e., at the top of minute 23, the M60 file is created from the OPMET_MINUTE files from the prior hour minute 23, through the current hour minute 22.)
- The H01_OPMET file is recreated only once an hour and contains the last hour's worth of data

6.3.4 Format of OPMET Files

The OPMET files contain multiple WMO records are formatted in accordance with WMO Publication 386. The format is also described on the NWS web site:

http://www.weather.gov/tg/head.html.

6.4 PNG

Portable Network Graphic (PNG) images of the Significant Weather ICAO area charts are stored in the PNG folder of the WIFS file system. The WMO messages in Table 6-1 are retained in the PNG folder for 36 hours.

Table 6-1 Significant Weather PNG Files

WMO Header	Area
PGEE05 KKCI	ICAO A
PGIE05 KKCI	ICAO B1
PGGE05 KKCI	ICAO F
PGAE05 KKCI	ICAO H
PGBE05 KKCI	ICAO I
PGJE05 KKCI	ICAO J
PGDE29 KKCI	ICAO M
PGNE14 KKCI	North Atlantic Ocean Region

Figure 6-8 depicts a snapshot of the files maintained in this folder.

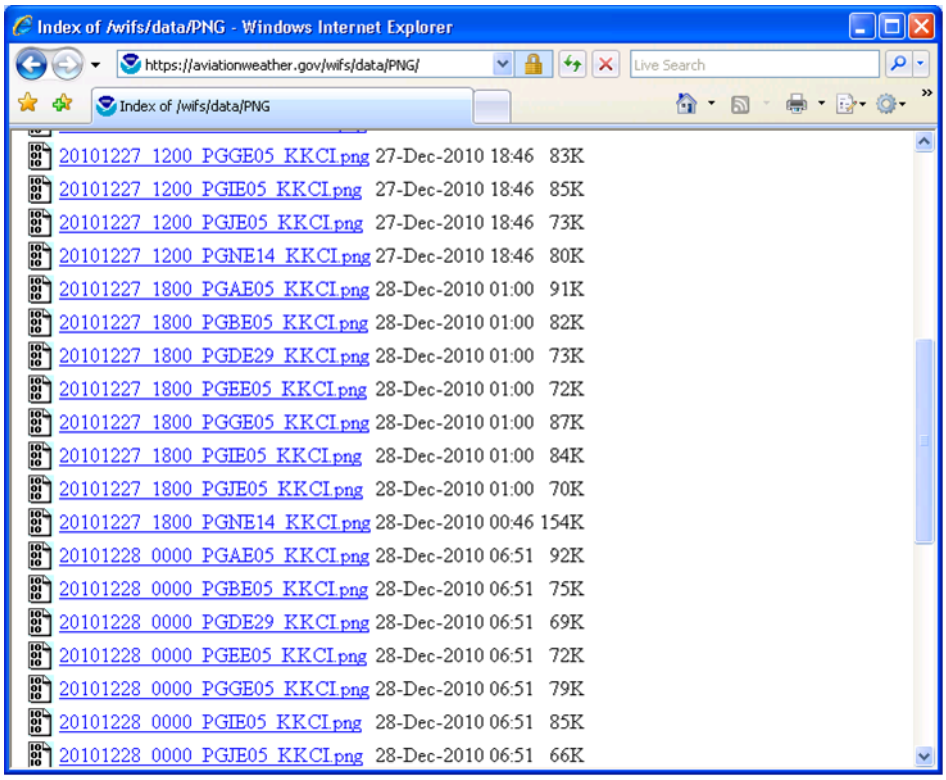

Figure 6-8 Snapshot of the PNG folder

The file naming convention for these files is:

YYYYMMDD_HH00_TTAAii_CCCC.png where

YYYY	=	4-digit year
MM	=	2-digit month
DD	=	2-digit day
HH	=	2-digit hour of forecast package valid time
00	=	Fixed characters
TTAAii_CCCC	=	WMO header and site identifier
.png	=	File extension

6.4.1 Format of PNG Files

For detailed information on the PNG format, see the W3C Portable Network Graphics (PNG) Specification (Second Edition) (http://www.w3.org/TR/PNG).

6.5 ADMIN_MSGS

Administrative messages are retained on WIFS for 36 hours. Each file contains a single message. Figure 6-9 is a snapshot of the administrative messages found on the WIFS servers.

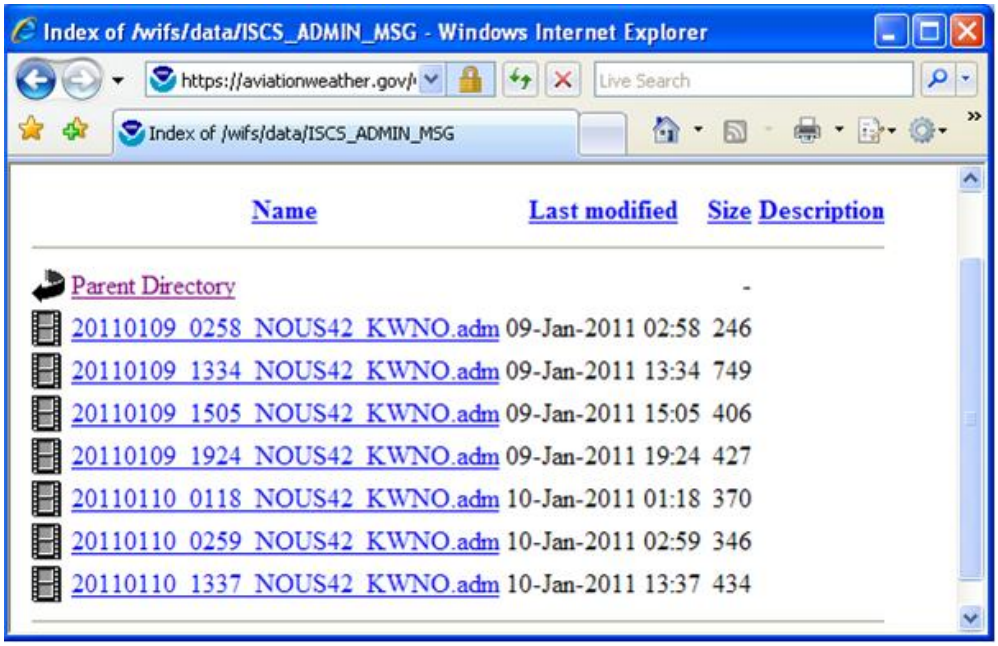

Figure 6-9 Snapshot of the ADMIN_MSGS folder

The file naming convention for these files is:

YYYYMMDD_hhmm_NOUSii_CCCC.adm where

YYYY	=	4-digit year
MM	=	2-digit month
DD	=	2-digit day
hh	=	2-digit hour of message issuance time
mm	=	2-digit minute of message issuance time
00	=	Fixed characters
NOUSii_CCCC	=	WMO header and site identifier
.adm	=	File extension

6.5.1 Format of Administrative Message Files

The Administrative message files contain a single WMO record formatted in accordance with WMO Publication 386. The format is also described on the NWS web site:

http://www.weather.gov/tg/head.html.

7 WIFS Support Web Site

WIFS also has its own support web-site, which can be accessed by opening the following link in a web browser: http://aviationweather.gov/wifs.

The intent of this web site is to provide all the necessary information in support of WIFS. It provides additional information about the products not contained in this user's guide, such as the list of available products which may change of time.

The web site has the following key capabilities:

- Provides the user the ability to register for WIFS
- The latest version of this users guide can be found under the Documentation page
- The Products page provides details on the type of available products on WIFS along with the list of specific products by WMO header
- Contact information and troubleshooting tips can be found under the Support page
- A link to the current set of vendors that can provide support to WIFS users is found under the Vendors page
- The Advisories page provides the latest operational status about the WIFS service its self

8 WIFS Customer Support

The WIFS Customer Support Desk is available to address issues Monday through Friday between the hours of 7am to 3pm US Central Time. To contact the WIFS Customer Support:

E-mail: wifs.admin@noaa.gov

Phone: +1 (877) 280-2811

If a user experiences operational issues outside of normal WIFS Customer Support Desk hours, they can generally expect a response within 3 hours after the Customer Support Desk re-opens. For each operational issue identified, a service ticket will be generated and users will be sent an e-mail with the service ticket number. Users should refer to this ticket number in all follow-up correspondence with the WIFS Customer Support Desk.

If users require immediate help outside of normal business hours they should contact the NWS Telecommunications Operations Center Help Desk at +1 (301) 713-0902.

9 User Troubleshooting Guidelines

Table 9-1 provides an initial set of troubleshooting guidelines to help users with possible issues. This information can also be found on the WIFS Support web-site which may be updated with more troubleshooting guidelines.

Table 9-1 Troubleshooting Guidelines

Symptom	Probable Cause	Actions to Take
Data out of date, cannot be retrieved, or is not being properly displayed on the missing on the workstation	WAFS data retrieve process failed	Test the internet connection[1]
		Check the data retrieve log file for errors[2]
		Contact the WAFS workstation support team
	Data on WIFS is out of date	Test the internet connection[1]
		Browse to the WIFS online file list and check to see if data is up to date[3]
		If data is out of date send an email to wifs.admin@noaa.gov and contact the NWSTG to report the problem.[4]
	There is a WIFS data ingest problem	Check the Advisories page for new advisories pertaining to data outages.
		If data is out of date send an email to wifs.admin@noaa.gov and contact the NWSTG to report the problem.[4]

Notes:

1. To test your internet connection, try to "ping" your primary WIFS URL (i.e., "ping http://srh.aviationweather.gov/wifs"). If the ping is successful you have a working internet connection. If it is not, contact your system administrator or your Internet Service Provider for assistance.
2. If you don't know where this file is or how to access it, contact the WAFS Workstation Support Team.
3. In your browser type in the URL of your primary WIFS location (i.e., http://srh.aviationweather.gov/wifs). Click on the appropriate category and find the data you are looking for. Take note of the file name with the latest date/time.
4. The National Weather Service Telecommunications Gateway (NWSTG) Helpdesk phone number is (301) 713-0902.

Appendix A. Gnu Wget

GNU Wget is a free software package for retrieving files using HTTP, HTTPS and FTP, the most widely-used Internet protocols. It is a non-interactive command-line tool that can be executed from programs, scripts, and cron jobs. GNU Wget has many features to make retrieving large files easy, including:

- Can resume aborted downloads, using `REST` and `RANGE`
- Can use filename wild cards and recursively mirror directories
- NLS-based message files for many different languages
- Optionally converts absolute links in downloaded documents to relative, so that downloaded documents may link to each other locally
- Runs on most UNIX-like operating systems as well as Microsoft Windows
- Supports HTTP proxies
- Supports HTTP cookies
- Supports persistent HTTP connections
- Unattended / background operation
- Uses local file timestamps to determine whether documents need to be re-downloaded when mirroring
- GNU Wget is distributed under the GNU General Public License.

To download Wget, navigate to http://ftp.gnu.org/gnu/wget/.

GNU Wget documentation can be found at http://www.gnu.org/software/wget/manual/

For other manuals, please see http://www.gnu.org/manual/.

The structure of the command including only the *required* arguments is described below. The Wget utility is powerful and includes the capability of performing recursion, statistics, logging, and much more.

```
wget --user=<user> --password=<password> --no-check-certificate <URL>
```

where

```
user = your WIFS login name
password = your WIFS password
no-check-certificate = required argument
```

A.1 Use Case

Below is a use-case scenario for how a fictitious user (John Smith) might identify a file he wants, and uses wget to download the file from WIFS. In this case John knows he wants a Significant Weather PNG chart.

1. John identifies the file he wants (20100715_0600_PGEE05_KKCI.png). He does this in one of two ways:
   A. Using his browser
      - He navigates to http://aviationweather.gov/wifs/data
      - He enters his WIFS user ID and password
      - He clicks on the PNG folder
      - He locates the file of interest in the listing
   B. Using a Wget file listing
      - John issues the following command:

        wget --user=johnsmith --password=wxdude --no-check-certificate https://crh.aviationweather.gov/wifs/data/PNG/
      - The "index.html" file for the PNG data folder will be downloaded to the current working folder on John's computer. John can then open this file in his browser to see the directory listing.
      - The following directories can be listed:
        - BUFR
        - GRIB
        - GRIB2
        - ADMIN_MSGS
        - OPMET-HOURLY
        - OPMET-MINUTE
        - OPMET-ROLLING
        - PNG
2. John downloads the file using Wget
   A. On the command line from his computer, John types the following command:

      wget --user=johnsmith --password=wxdude --no-check-certificate https://crh.aviationweather.gov/wifs/data/PNG/20100715_0600_PGEE05_KKCI.png
   B. John's file will be downloaded to the current working directory on his computer.