BY ORDER OF THE COMMANDER
GRAND FORKS AIR FORCE BASE

GRAND FORKS AIR FORCE BASE
INSTRUCTION 15-101

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Weather

WEATHER SUPPORT INSTRUCTION

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This instruction implements Air Force Policy Directive (AFPD) 15-1, Air Force Weather Operations, Air Force Strategic Plan on Weather Reengineering, Air Force Instruction (AFI) 10-206, Operational Reporting, AFI 15-114, Functional Resource and Weather Technical Performance Evaluation, AFI 15-128, Air Force Weather Roles and Responsibilities, AMCI 15-101, Weather Operations And Support. AFI 10-2501, Air Force Emergency Management (EM) Program Planning and Operations, Air Force Manual (AFMAN) 15-111, Surface Weather Observations, AFMAN 15-124, Meteorological Codes, AFMAN 15-129V1, Air and Space Weather Operations - Characterization, AFMAN 15-129V2, Air and Space Weather Operations - Exploitation. It establishes responsibilities and weather support procedures. It also provides general information for weather services, including weather observations and forecasts, weather warnings, watches, and advisories; space weather data, information dissemination, and base-wide reciprocal support. It applies to units assigned to the 319th Reconnaissance Wing (319 RW), subordinate units, and units assigned, attached, or supported by Grand Forks Air Force Base. Ensure all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 33-322, Records Management Program, and disposed of in accordance with the Air Force Records Information System (AFRIMS) Records Disposition Schedule (RDS) located at **https://www.my.af.mil/gcss-af61a/afrims/afrims/**. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, Recommendation for Change of Publication; route AF Forms 847 from the field through the appropriate functional' s chain of command.

SUMMARY OF CHANGES

This version brings the GFAFBI 15-101 in line with all of the most current AFMANs and guidance provided by Air Force Weather. The usage of "ABW" was removed throughout, and replaced with "RW" to reflect the installation's changing role within the Air Force. "AMOS" was removed throughout and replaced with "FBWOS". Verbiage has been changed in sections 1.3.1.1., 1.4., 1.5.3.2., 2.2.5., **Table 2.1**, **2.4**, **Table 2.2**, **Table 2.3**, **Table 2.4**, **Table 2.5**, **Figure 2.1**, **2.6.3**, **2.8.3.1**, **2.8.4**, **3.6**, **3.8**, and **5.5** to reflect changing mission requirements. Sections 1.6.2., 1.6.3., and 3.3.2. are no longer required and have been removed completely. All attachments have been checked and adjusted as needed. Various verbiage throughout the document has been reworked to provide greater clarity and understanding where necessary.

Chapter 1

CHARACTERIZATION UNIT (CU) & EXPLOITATION UNIT (EU) INTERACTIONS

1.1. General. The 15th Operational Weather Squadron (15 OWS), and the 319th Operations Support Squadron Weather Flight (319 OSS/OSW) are the official weather information agencies for Grand Forks Air Force Base, North Dakota. These agencies provide weather information in support of the 319th Reconnaissance Wing (319 RW), 69th Reconnaissance Group (69 RG), Department of Homeland Security (DHS), and all other subordinate units. The 319 OSS/OSW is commonly referred to as the weather flight (WF), and is the focal point for all weather-related issues. The WF does not maintain GDSS accounts or track missions through the system in any way. This instruction will be reviewed and revised no greater than biannually or IAW with host/parent unit procedures if the time is less than biannually.

1.1.1. The 15 OWS is considered the Characterization Unit (CU). Characterization encompasses the collect, analyze, and predict weather core competencies. Characterization depends on Air Force Weather's ability to collect accurate data, analyze that data, and use the results to produce a coherent picture of the present and future state of the air and space environment. Other OWSs may be used for tenant aircraft flying in different AORs.

1.1.2. 319 OSS/OSW is considered an Exploitation Unit (EU). Exploitation is the ability to minimize the impact of environmental threats to friendly forces while simultaneously capitalizing on environmental conditions that maximize the operational advantage over enemy forces. Exploitation Units tailor the characterization products provided by the CU. Tailoring is the extraction of data that is pertinent to a specific mission profile from the overall characterization of the air and space environment. Tailoring does not mean changing the characterization. To the greatest extent possible, Exploitation Units will use the characterized data provided to them by the 15 OWS.

1.2. Concept of Operations.

1.2.1. The 15 OWS at Scott AFB, Illinois, provides regional and operational-level weather products and information to Air Force and Army units in the Northeast region of the Continental United States (CONUS).

1.2.2. Meteorological Watch (METWATCH). The 15 OWS performs a continuous METWATCH for Grand Forks AFB. METWATCH is a deliberate, continuous process for monitoring terrestrial weather or the space environment in an area or region. The purpose of a METWATCH is to identify when and where observed conditions significantly diverge from forecast conditions. When conditions deviate beyond tolerated error margins, a course of action is determined for amending forecast products and notifying supported customers.

1.2.3. The weather flight is the primary source of tailored weather services for the 319 RW, 69 RG, DHS, and various headquarters elements and visiting aircrews. The WF will make every effort to ensure that mission-limiting weather is anticipated. That information will be relayed to supported customers so that safety and resource protection (RP) is maintained.

1.3. Responsibilities.

1.3.1. General responsibilities of the 15 OWS and WF are outlined in AFI 15-128, **para 2.3.3** and **para 2.3.4** respectively.

1.3.1.1. The 15 OWS issues the Grand Forks AFB terminal aerodrome forecast (TAF), and will provide flight weather briefings to transient aircrews passing through Grand Forks AFB when the weather flight is closed. The OWS is responsible for all weather watches with the exception of the lightning watch. The OWS will issue all observed warnings and advisories when the WF is closed.

1.3.1.2. The weather flight is responsible for all forecast warnings and the lightning watch. When the weather flight is open, it will issue all observed advisories. When the weather flight is closed, a standby forecaster will be designated for contact in the event that a warning (or the lightning watch) needs to be issued.

1.3.1.3. The WF will create Mission Weather Products (MWPs) that fuse theater-scale products with local mission requirements to enable the direct integration of weather impacts into warfighter planning and/or execution. The WF provides mission execution forecasts, and flight weather briefings IAW the WF duty priorities listed in **Table 1.1**

1.3.2. Grand Forks AFB Installation Data Page. The 15 OWS and Grand Forks WF will coordinate and maintain the Grand Forks AFB Installation Data Page detailing TAF specification and amendment criteria, WWA thresholds, desired lead times, mission impacts, unit information, Joint Environmental Toolkit (JET) back-up contacts and local outage back-up information. The KRDR WF data page is reviewed annually for accuracy.

1.3.3. Eyes Forward & Collaboration. The Grand Forks WF will act as the eyes-forward for the 15 OWS by relaying significant, time-sensitive meteorological information not found in coded meteorological reports to assist in forecast operations.

1.4. Duty Priorities. 319 OSS/OSW Duty Priorities. IAW AFMAN 15-129V2, **para 1.3.3.1,** WF will adhere to the following duty priorities based on 319 RW mission requirements.

Table 1.1. 319 OSS/OSW Duty Priority Listing

Priority	Duties
1	Perform EU Emergency War Order (EWO) Taskings
2	Execute WF evacuation
3	Respond to Aircraft/Ground Emergencies or Mishaps
4	Respond to Pilot to Metro Service (PMSV) Contacts
5	Provide Weather Information for Operations Supervisor (69 RG) & RPA operators
6	SWAP Operations
7	Augment Automated Meteorological Observing System Observations for Mandatory Elements
8	Provide "eyes-forward" support and collaborate with 15 OWS
9	Mission Execution Forecast Process -- Produce and Disseminate Forecasts

10	Disseminate Urgent PIREPs
11	Disseminate PIREPs
12	Perform MISSIONWATCH
13	Provide Briefings
14	Weather Functional Training
15	Complete other duties and administrative tasks

1.5. Hours of Operation & Contact Information.

1.5.1. The weather flight operates 24/7. Additionally, WF personnel are on duty during all 69 RG flying operations. WF personnel are also on duty when the airfield is controlled and no automated observing system capability exists; or SWAP has been activated as outlined in **para 2.8.2** The WF will stand up operations as directed by the 319 RW/CC or the 319 OSS/CC. Staff services are available during normal duty hours or as required. **Note:** For the purposes of this manual, regarding airfield status, "controlled" refers to periods of time that the airfield is being controlled by an air traffic control tower and is designated as Class B, C or D airspace.

1.5.1.1. The weather flight will close when the Airfield is not controlled (closed) **and** no supported units are conducting operations.

1.5.1.1.1. Prior to closing the station, the WF forecaster is responsible for contacting the 15 OWS, Air Traffic Control (ATC), base operations, and command post (CP). The forecaster will not leave the work center until all agencies have been notified.

1.5.1.2. The WF will also send a limited duty letter, via e-mail, to the 15 OWS identifying the WF standby schedule prior to closure.

1.5.2. The 15 OWS operates 24/7, 365 days a year.

1.5.3. Contact Information

1.5.3.1. WF (701) 747-4396 / DSN 362-4396

1.5.3.2. WF AOL (701) 747-3820 / DSN 362-3820

1.5.3.3. PMSV 343.5 MHz

1.5.3.4. 15 OWS (618) 256-9699 / DSN 576-9699

1.6. Alternate Operating Location Plan. Weather flight operations are susceptible to equipment and communication outages at the 15 OWS and locally.

1.6.1. WF Alternate Operating Location (AOL). In the event of a building evacuation, the WF will move to the alternate location in the ATC Tower. WF members will follow duty-specific Standard Operating Procedures (SOPs) and evacuation checklists (to include taking a myriad of required back-up equipment) and resume operations at the AOL as soon as possible. If access to the FBWOS data readout is lost, manual equipment will be used to take observations. Expect most services to experience some degradation (weather products, pilot briefings, etc.) due to limited facilities and the loss of dedicated data services, including sensors and various data types (meteorological satellite (METSAT), radar imagery, etc.). For

flight safety reasons, the WF will not evacuate during exercises. A memorandum of agreement (MOA) has been established with the Beale AFB WF to take over support of SIPRNet missions during short-term evacuation or communication outage events.

Chapter 2

AIRFIELD SUPPORT FUNCTION

2.1. General. The Airfield Support Function consists of weather observing, meteorological watch, and resource protection. Airfield Services forecasters are primarily focused on supporting operations and personnel on the installation and within the Grand Forks AFB aerodrome (defined as within 5NM of the airfield).

2.2. Observations. Observations are taken, recorded, and disseminated IAW AFMAN 15-111, *Surface Weather Observations*, utilizing the FMQ-19 Fixed Base Weather Observing System (FBWOS). Most observations are taken automatically by the FMQ-19 with no human intervention. Often, it is necessary for a weather forecaster to augment the data and observations being disseminated by the automated weather sensor. Automated and augmentation processes are outlined in **para 2.2.7** The following types of observation are created and disseminated:

2.2.1. Aviation Routine Weather Report (METAR). METAR observations are created between 45 and 59 minutes after every hour. METARs are disseminated both locally and long-line between 55 and 59 minutes after the hour.

2.2.2. Aviation Selected Special Weather Report (SPECI). SPECI is an unscheduled observation completed and transmitted when any of the Grand Forks AFB special criteria listed in **Attachment 3** have been observed or recorded on airfield meteorological sensors. ASPECI will contain all data elements found in a METAR plus additional remarks that elaborates on data in the body of the report. All SPECI reports will be prepared and transmitted as soon as possible after the relevant criteria are observed. **Attachment 4** contains an example SPECI weather observation.

2.2.3. Aviation Selected Local Weather Report (LOCAL). During augmentation, the WF will take single element LOCAL observations for altimeter setting changes.

2.2.4. Official Observing Points. The official observing point is the location of the active FMQ-19 sensor. During periods of augmentation, the observation point is on the eastern edge of the “red carpet” west of building 528 (Base Operations).

2.2.5. Observing Point Limitations.

2.2.5.1. The FMQ-19 is properly sited in accordance with all federal aviation and airfield regulations.

2.2.5.1.1. There are documented deficiency reports for false readings on the FMQ-19’s freezing precipitation sensor. Weather Flight personnel are aware of this shortcoming and steps have been taken to mitigate this problem.

2.2.5.2. Augmented observations taken at the primary augmentation site (Bldg. 528) are degraded because the observer’s view to the east is blocked by buildings and thunder may not be heard due to flight-line noise.

2.2.6. Automated FMQ-19 Observation. An automated observation is any observation having been evaluated, prepared, and transmitted by an observing system without human intervention. In automated mode, the FMQ-19 observing system will record and disseminate weather observations. The FMQ-19 uses time-averaging of sensor data. In an automated

observation, sky condition will be an evaluation of sensor data gathered during the 30-minute period ending at the actual time of the observation. All other elements evaluated are based on sensor data that is within 10 minutes or less of the actual time of the observation.

2.2.7. Forecaster FMQ-19 Augmentation. Augmentation is the process of having a certified weather technician manually add or edit data to an observation generated by the FMQ-19. WF personnel do not augment the FMQ-19 when the airfield is uncontrolled (unless SWAP has been implemented [see **paragraph 2.8.2**] and it is necessary to provide the eyes forward function, or to supplement for tornadic activity IAW AFMAN 15-111, Surface Weather Observations). The processes used are supplementing and back up.

2.2.7.1. Supplementing (definition). Manually adding meteorological information to an observation generated by the FMQ-19 that is beyond that system's capability to measure and report. For example, the sensor cannot sense a tornado or hail.

2.2.7.2. Supplementing procedures. WF personnel will supplement observations when the airfield is controlled and the weather conditions in **Table 5.1** are observed. WF personnel will be ready to supplement observations if the conditions in **Table 5.1** are forecast to occur within 1 hour. Weather personnel are required to log on to an automated dissemination system (JET) and be prepared to supplement whenever a watch or warning has been issued for tornadic activity or when criteria outlined in **Table 5.1** is observed.

Table 2.1. Mandatory Supplementation Conditions

Tornado **(+FC) (Notes 1 & 2)**
Watersprout (+**FC**) (**Notes 1 & 2**)
Funnel Cloud (**FC**) (**Notes 1 & 2**)
Freezing Precipitation (**FZDZ/FZRA**)
Ice Pellets (**PL**)
Hail (**GR**)
Sandstorm (SS)/Dust Storm (**DS**) (**Note 3**)
Volcanic Ash (**VA**)
Tower Visibility remark (**Note 4**)
Notes: 1. The immediate reporting of tornadic activity takes precedence over all other phenomena. 2. Be prepared to supplement whenever a tornado watch is valid or warning has been issued; regardless of airfield closure status. 3. Based on local weather warning criteria; if no warning criteria exists, this is not required. 4. Only required during controlled airfield hours.

2.2.7.3. Backup (definition). Back-up is the process of manually editing/adding data or dissemination capability when the primary method is not operational, unavailable or suspected to be providing erroneous data (e.g. sensor/comm. failure, dew point higher than temperature).

2.2.7.4. Backup procedures. In the event of FBWOS malfunction or failure, back-up procedures will be implemented only during airfield operating hours and/or if tornadic activity is occurring or forecast to occur. WF personnel will use manual observing procedures when performing back-up operations. When required, the WF will encode and

disseminate METAR and SPECI observations IAW AFMAN 15-111. All element entries must have been observed within 15 minutes of the actual time of the observation with the exception of wind gusts and squalls, which are reported only if they are observed within 10 minutes of the time of the observation. When utilizing back-up equipment, respective wind and pressure values must be estimated.

2.3. TAF Support. Grand Forks AFB TAFs are produced and disseminated by the 15 OWS IAW AFI 15-128, AFMAN 15-124, AFMAN 15-129V1, and the Grand Forks AFB Installation Data Page. **Attachment 3** lists forecast specification and amendment criteria. TAFs are valid for 30 hours, apply to the area within the 5NM area of the Grand Forks AFB airfield complex, and will be issued at 0200, 1000, and 1800 Zulu time. **Attachment 4** contains examples of typical Grand Forks AFB TAFs.

2.4. Resource Protection (RP) Support & Warnings, Watches and Advisories (WWA). The 15 OWS conducts a continuous meteorological watch to identify and assess emerging and imminent threats to Grand Forks AFB. Special Weather Statements (SWS) and weather watches, are special notices issued by the 15 OWS resulting from both the forecast and METWATCH processes to assist military decision makers with resource and RP decisions. Watches and warnings provide notice of weather events posing a hazard to life or property. Advisories provide specific notice to an operational agency of environmental phenomena with the potential to impact operations. Customer responses to WWAs are listed in **Attachment 5**.

2.4.1. Special Weather Statement (SWS). SWSs also known as Long Range Threat Forecasts are special notices issued by the 15 OWS to assist military decision makers with RP decisions. These statements are sent to the WF organization inbox.

2.4.2. Weather Watches. A weather watch is a special notice to installation personnel/supported units of a **potential for the occurrence** of environmental conditions of such intensity as to pose a hazard to life or property. They are used by installation personnel/supported units to make force protection and risk management decisions. Watches are issued for a 5NM radius of the center point of the Grand Forks AFB runway complex and are defined in **Table 2.2**

Table 2.2. Weather Watches.

Watch Type	Criteria	Desired Lead Time
Tornado	within 5NM	As potential warrants
Severe Thunderstorms Damaging Hail Damaging Winds	≥ 3/4 inch ≥ 50 knots	As potential warrants
Damaging Winds	≥ 50 knots	As potential warrants
Freezing Precipitation	Any Intensity	As potential warrants
Heavy Rain	≥ 2 inch accumulation in ≤ 12 hours	As potential warrants
Heavy Snow	≥ 2 inch accumulation in ≤ 12 hours	As potential warrants
Blizzard	Duration: ≥ 3 hrs, - sustained winds/gusts ≥ 30 kts - considerable falling/blowing snow - prevailing visibility frequently ≤ 1/4 SM	As potential warrants
Lightning	within 5NM	30 Minutes

2.4.3. Weather Warnings. A special notice to notify installation personnel when an established weather condition of such intensity as to pose a hazard to life or property **is occurring or is expected to occur**. Weather warnings provide concise information outlining environmental threats and are used by commanders and personnel to make RP decisions and take protective action. Warnings are issued for a 5NM radius at the center point of the runway and are defined in **Table 2.3**

Table 2.3. Weather Warnings.

Warning Type	Criteria	Desired Lead Time
Tornado	expected within 5NM	15 minutes
Severe Thunderstorms Damaging Hail Damaging Winds	≥ 3/4 inch ≥ 50 knots	1 hour
Moderate Thunderstorms Large Hail High Winds	≥ 1/4 inch but < 3/4 inch ≥35 knots but < 50 knots	1 hour
Damaging Winds	≥ 50 knots	1 hour
Strong Winds	≥ 35 knots but < 50 knots	1 hour
Freezing Precipitation	Any Intensity	1 hour
Heavy Rain	≥ 2 inch accumulation in ≤ 12 hours	1 hour
Heavy Snow	≥ 2 inch accumulation in ≤ 12 hours	1hour
Blizzard	Duration: ≥ 3 hrs, sustained winds/gusts ≥ 30 kts considerable falling/blowing snow prevailing visibility frequently ≤ 1/4 SM	1 hour
Lightning	within 5NM	Observed

2.4.4. Observed Weather Warnings. Lightning warnings are the only observed warnings issued for Grand Forks AFB and extend 5 NM in all directions from the airfield. Lightning warnings are not issued until lightning is observed, either visually or via the National Lightning Detection Network. Lightning warnings will remain valid until lightning is no longer observed within 5NM for at least 15 minutes since the last occurrence. Exception: A lightning warning will not be cancelled if a thunderstorm is within 5NM (as indicated on radar or lighting detector software).

2.4.5. Observed Weather Advisories. An observed weather advisory is a special product notifying an end user when an established environmental condition is presently occurring on Grand Forks AFB. Advisories for the installation are defined in **Table 2.4**

Table 2.4. Observed Weather Advisories.

Criteria	Forecast/Observed
Crosswinds ≥ 15 kts	Observed
Any Icing within 50 NM	Observed
Induction Icing Occurring (20-45°F w/ DPD < 9°F)	Observed
Lightning within 20 NM	Observed
Lightning within 10 NM	Observed
Temp ≥ 90°F (32°C)	Observed
MDT or Greater Turbulence within 50 NM	Observed
Wind Chill ≤ -48°F	Observed
Wind Chill between -34°F to -47°F	Observed
Wind Chill between -15°F to -33°F	Observed
Winds ≥ 40 kts	Observed
Winds ≥ 30 kts but < 40 kts	Observed
Notes: 1. Crosswinds are calculated based on the maximum observed wind speed (to include gusts) and worst case observed direction including variability.	

2.4.6. WWA Numbering Scheme. Advisories, watches, and warnings are numbered consecutively by identifying the type of weather message (watch, warning, or advisory) followed by a five-digit number. The first two numbers indicate the current month while the second three numbers indicate the sequence number. For example, the message "Weather Warning 02-005" means the month is February (02) and this is the fifth (005) warning issued in the month. The message "Weather Advisory 12-013" means the month is December (12) and this is the thirteenth (013) advisory issued in the month. Examples of different messages are contained in **Attachment 5**.

2.4.7. WWA Upgrades/Downgrades. WWAs will be upgraded (i.e., winds increase from 35 knots to 50 knots) or downgraded as required. Upgrades will meet the desired lead times specified in **Tables 2.3** and **2.4** Only one warning will be in effect at a given time (and will include multiple warning criteria as required) except for forecast tornado warnings and/or observed lightning warnings. Tornado and lightning warnings will be issued separately. With the exception of tornado and lightning warnings, if a warning is issued for one criteria and it becomes necessary to warn for another criteria, a new warning and new number will be issued, to include all criteria expected. A separate valid time may be specified for each criterion if necessary.

2.4.8. WWA Amendments. When WWAs no longer adequately describe the phenomenon's expected occurrence, a completely new WWA with a new number will be issued. The amendment will clearly state how the amendment or extension affects any previously issued notices.

2.4.9. WWA Extensions. WWAs may be extended provided the extension is issued prior to the expiration of the original notice.

2.4.10. WWA Cancellation. Warnings and watches are canceled when the weather phenomena is no longer occurring or expected to occur. Warnings not extended or canceled will automatically expire at the end of the valid period. Observed advisories will be canceled when the criteria is no longer occurring and have not occurred in the last 30 minutes. See **para 2.4.4** for cancellation of observed lightning warnings.

2.5. Dissemination Process.

2.5.1. **Observations.** Observations taken by either the FMQ-19 FBWOS or the weather technician are disseminated via JET. When JET is not operational, the WF will relay observations to the following local organizations in order of priority listed in **Table 2.5**

Table 2.5. Notification Priority.

1. Tower commercial (701) 747-3808
2. RAPCON commercial (701) 747-6110
3. 319 RW CP commercial (701) 747-6711
4. Airfield Management commercial (701) 747-4409
5. 15 OWS commercial (618) 256-9699

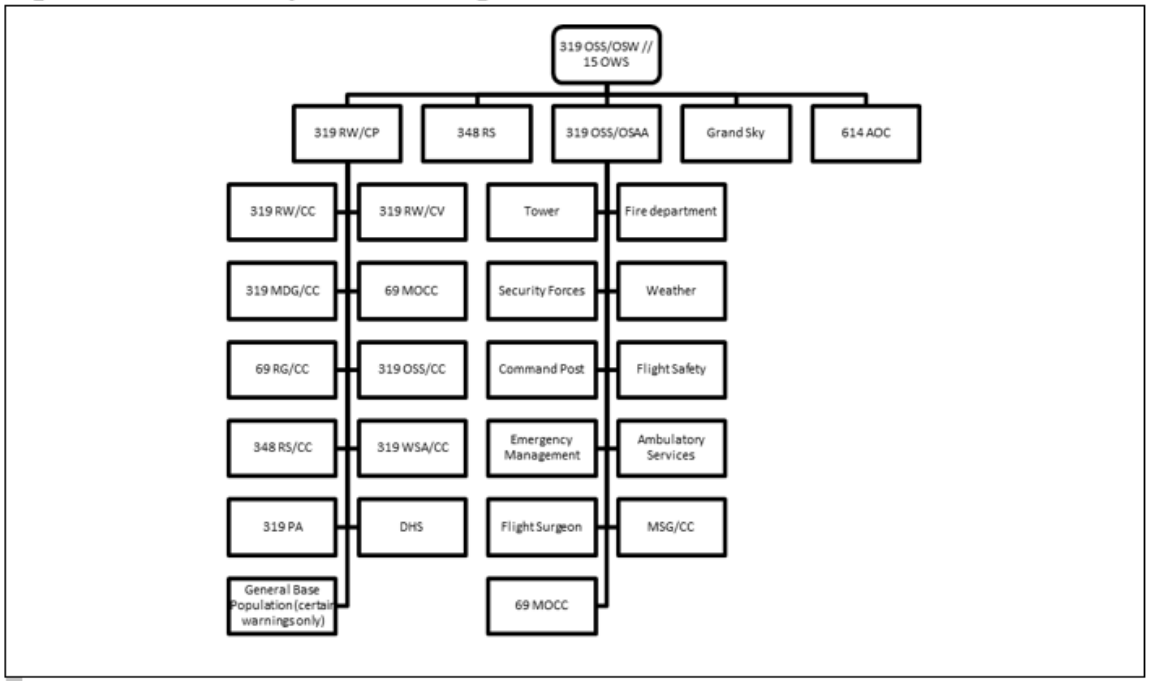
2.5.2. TAFs. 15 OWS disseminates TAFs via JET. If JET is non-operational, the WF will disseminate TAFs to flying customers via telephone, fax, or e-mail or by uploading to AFW-WEBS.

2.5.3. SWSs. SWSs provide advance notice of widespread hazardous weather conditions that have the potential to affect Grand Forks AFB. 15 OWS transmits SWSs to WF leadership via email. WF leadership forwards SWSs to 319 OSS leadership as required for elevation to 319 RW leadership.

2.5.4. WWAs. The 15 OWS or WF will disseminate WWAs via JET. If JET is inoperable, the 15 OWS or the WF will make back-up calls. Upon notification, these units will further disseminate *all* WWAs using the pyramid notification scheme shown in **Figure 2.1** In addition, the 319 RW/CP disseminates all WWAs via AtHoc.

2.5.4.1. **Giant Voice** . Between the hours of 0700 and 2200, the 319 RW/CP disseminates the following warnings over the Giant Voice system: Tornadoes, severe thunderstorms (damaging winds/damaging hail) and observed lighting within five nautical miles.

Figure 2.1. Weather Pyramid Alerting



2.6. Cooperative Weather Watch (CWW). The WF and ATC have established a CWW as required by AFI 13-204V3 and AFMAN 15-111. The agreement outlines each unit's responsibilities when specific meteorological phenomena are observed. The weather flights primary concern is the report of tower visibility differing from the prevailing surface visibility, local PIREPs**,** and any occurrence of previously unreported weather conditions that could affect flight safety or be critical to the safety or efficiency of other local operations and resources. All WF technicians must thoroughly understand and be able to execute every element in the local cooperative weather watch agreement.

2.6.1. Grand Forks AFB Tower personnel will:

2.6.1.1. Notify the weather technician when the observed tower prevailing visibility decreases to less than or increases to equal or exceed 4 statute miles.

2.6.1.2. Report changes in tower prevailing visibility to the weather technician when tower visibility is less than 4 statute miles (6000 meters) and differs from the surface prevailing visibility by a reportable value.

2.6.1.3. Notify the weather technician when PIREPs are received of previously unreported weather conditions that could affect flight safety or be critical to the safety and efficiency of other local operations and resources. PIREP information will be relayed to weather personnel no later than 5 minutes after receipt.

2.6.2. When augmenting observations, Grand Forks AFB weather technicians will:

2.6.2.1. Notify the tower, as soon as possible, whenever the prevailing visibility at the official weather observation point decreases to less than or increases to equal or exceed 4 statute miles.

2.6.2.2. Re-evaluate surface prevailing visibility, as soon as practicable, upon initial receipt of a differing control tower value and upon receipt of subsequent reportable changes at the control tower level. Note: automated stations do not include tower visibility in observation remarks.

2.6.2.3. Use control tower values of prevailing visibility as a guide in determining the surface visibility when the view of portions of the horizon is obstructed by buildings, aircraft, etc.

2.6.3. ATC Limited Observation Training. The 319 OSS/OSW oversees the Grand Forks AFB Limited Observation Training Program. ATC personnel requiring training should contact the WF at DSN 362-4396/Commercial (701) 747-4396 to schedule an appointment. To satisfy Limited Observation Training requirements, personnel are required to pass the CBT on Air Force Weather Knowledge Center, receive weather indoctrination training and get an orientation of the weather facilities.

2.7. PMSV Support. Weather information is available via PMSV during duty hours on frequency 343.5 MHz. The duty forecaster will monitor PMSV traffic for all aircraft contacts. For aircraft outside the range of our PMSV system, the Grand Forks WF can provide PMSV support through a phone patch to the 319 RW/CP (DSN 362-6711/Commercial (701) 747- 6711). PMSV outages are discussed in **para 5.3.2**

2.8. Emergency Action Response

2.8.1. Aircraft Mishap. When notified of an aircraft mishap, the WF will initiate a save of applicable data used in the development of any weather products provided. This data will then be provided to investigating agencies upon request.

2.8.1.1. The Grand Forks AFB weather flight will make the servicing OWS aware of any aircraft mishaps that occur during the weather flight's MISSIONWATCH for supported-units' operations. The weather flight will coordinate with the appropriate OWS to complete a save of all applicable data and forecast products available for the operation in question. This data can then be used to reconstruct the state of the atmosphere at the time of the incident if necessary.

2.8.1.2. If another weather unit provided the forecast (and is conducting MISSIONWATCH), they will initiate the data save in coordination with any other Air Force weather units involved.

2.8.2. SWAP. The WF forecaster will assess the need to recall SWAP personnel in accordance with criteria listed in **Table 2.6** SWAP ensures sufficient manpower is available to meet the increased demand for timely weather information from its supported unit(s) during significant weather events. It is imperative that timely and accurate weather watches, warnings, and advisories are disseminated to all agencies to ensure personnel and RP. The WF will initiate a heightened METWATCH during such weather events. The WF forecaster will notify the WF NCOIC or Superintendent of SWAP activation during normal staff duty hours. During non-duty hours or closure periods, the 15 OWS will notify the WF standby forecaster when conditions listed in **Table 2.6** have been met.

Table 2.6. Conditions Requiring SWAP Activation

SWAP Activation Criteria
1. One of the following is issued:
Tornado Watch/Warning
Damaging hail ≥ 3/4 inch Watch/Warning
Damaging winds ≥ 50 kts Watch/Warning
Blizzard watch/warning
Freezing precipitation watch/warning

2.8.3. WF Forecaster Recall Requirements. The WF forecaster will be notified/recalled under the following circumstances:

2.8.3.1. The 15 OWS notifies the standby forecaster prior to issuing any watch or warning for Grand Forks AFB. If the standby forecaster can't be reached, the NCOIC will be contacted.

2.8.3.2. If the FBWOS data feed becomes unavailable for any reason, ATC (or the 15 OWS) will immediately notify the duty forecaster. During periods of uncontrolled airfield hours, the 15 OWS will notify the standby forecaster.

2.8.3.3. The 15 OWS notifies the standby forecaster when observations are not being transmitted or are not representative of current conditions.

2.8.4. Chemical, Biological, Radiological, and Nuclear Defense (CBRN) Response.

2.8.4.1. If surface observations or alphanumeric forecasts are requested, the WF will make sure that those observations and forecasts are representative of the location and time of the CBRN event.

2.8.4.2. WF personnel will work closely with Emergency Management or other functions to ensure the supported commander gets a consistent picture.

2.8.4.3. Upon request from Emergency Management or any other agency, WF personnel will obtain/provide Chemical Downwind Messages and Effective Downwind Messages.

Chapter 3

MISSION SERVICES

3.1. General. The WF and 15 OWS support the Grand Forks AFB flying and non-flying missions. This chapter identifies the flying and non-flying missions and the weather support provided.

3.2. Flying Missions. The WF provides weather support to the flying units listed in **Attachment 6.**

3.3. Mission Weather Product. Mission Weather Products **(**MWPs) fuse theater-scale products with local mission requirements enabling the direct inject of weather impacts into warfighter planning and/or execution. The result is a tailored product designed to provide timely, accurate, and relevant environmental information for planning and execution. The MWPs must be horizontally consistent with (but not necessarily mirror) products issued by any OWS and the 557th Weather Wing.

3.3.1. **Flight Weather MWPs** . Microsoft PowerPoint is the primary method used by the weather flight to brief 69 RG missions. The WF also utilizes a MEF created by the 380 EOSS Weather Flight at Al Dhafra AB, UAE, to support 69 RG missions.

3.3.2. **Department of Homeland Security (DHS)** . DHS utilizes UAV assets which are stored and flown out of Grand Forks Air Force Base. DHS missions are not provided MWPs, only local weather support (observations, warnings, watches, and advisories). The WF communicates weather support to DHS via email and telephone.

3.4. MISSIONWATCH. MISSIONWATCH is a deliberate process for monitoring terrestrial weather or the space environment for specific mission-limiting environmental factors. The MISSIONWATCH process identifies and alerts decision makers to changes affecting mission success.

3.4.1. WF Briefed Sorties. It is through MISSIONWATCH that MWP amendments/updates are accomplished. During rapidly changing weather, the WF will inform the OWS when weather products issued by the OWS do not accurately reflect observed conditions and impact flight safety. The WF will amend/update the MWP as necessary. In addition, when previously un-forecasted weather conditions develop that place a mission at risk, the WF will contact Global Hawk aircrews via MIRC or SIPR phone and relay any changes. MISSIONWATCH will be conducted and logged.

3.4.1.1. The WF will:

3.4.1.1.1. Actively MISSIONWATCH all 348 RS sorties and locally produced transient briefings. MISSIONWATCH will be conducted and logged.

3.5. Post-Mission Analysis/Feedback. Aircrews should contact the WF with post-mission information and/or follow-up support. The WF will utilize customer feedback to improve internal processes and enhance training, forecast proficiency, and product accuracy. Formal/informal feedback methods include:

3.5.1. Completion of 319 OSW Feedback worksheet or feedback solicitation email.

3.5.2. Phone call or an e-mail to the WF.

3.5.3. Face-to-face feedback after briefing and/or mission completion.

3.6. Transient Aircrew Support. Weather technicians will provide or arrange for weather support for transient aircrews IAW the duty priorities list **Table 1.1** The WF may provide flight weather briefings (175-1s), and/or updates to aircrews, as long as they are not flying CORONET/TACC missions. Weather technicians may arrange for weather support from the 15 OWS briefing cell when greater duty priorities take precedence. The 15 OWS briefing cell can be reached at DSN 576-9755/9702, commercial (618) 256-9755/9702 24 hours a day.

3.6.1. The 319 RW/CP does NOT have the ability contact airborne flight crews via phone patching.

3.7. Non-Flying Missions. The WF supports various non-flying missions (e.g., Winter Bash/Summer Bash, change of command ceremonies, Morale Welfare and Recreation) through RP (WWAs). Specific support to non-flying missions is identified in **Chapter 4**. Specialized weather information can be provided to support any non-flying mission upon request. Non-governmental agencies should request weather information and support through 319 Public Affairs (PA).

3.8. Space Weather Impacts. Grand Forks' missions have a wide-variety of parameters affected by various space-weather conditions (High Frequency and Ultra High Frequency communication, radar, Global Positioning System communications, etc.). The WF provides space impacts on their MWPs. More detailed products are available at **https://15ows.us.af.mil/product/space_weather**. An example of the daily discussion is provided in **Attachment 7**.

Chapter 4

STAFF SERVICES

4.1. General. Staff services are typically accomplished by WF leadership and include meteorological functions (briefings), ensuring the WF is trained and equipped for day-to-day operations, and cultivating relationships with base agencies to ensure WF support is optimal.

4.2. Staff Meteorological Functions . Staff meteorological functions aid leadership in identifying and understanding specific weather and environmental impacts. The WF is available to assist commanders in determining weather support requirements and impacts to operations. Examples of staff meteorological functions provided are:

4.2.1. 319 RW Staff Briefings. Staff weather briefings for 319 RW (wing stand up) will be provided as required. Standard information includes daily weather story, satellite picture, radar imagery, 5-day Grand Forks AFB weather outlook, and solar situational awareness with a focus on any affected Wing events.

4.2.2. Installation Control Center (ICC)/Crisis Action Team (CAT) Briefings. The WF will provide weather support as required for ICC/CAT briefings. This includes real-world emergency, exercise, and deployment briefings. Each briefing will be tailored to provide the appropriate weather intelligence required by 319 RW leadership.

4.2.3. Instrument Refresher Course (IRC) Briefings. In accordance with AFMAN 11-210, *Instrument Refresher Course (IRC) Program*, computer based training is available for the weather portion of the briefing. If requested, the WF will provide a briefer to discuss more detailed local weather effects and impacts. This briefing would include a summary of airfield and mission services, WF capabilities, RP, seasonal/regional weather and space weather impacts (when applicable).

4.2.4. Pre-deployment Planning Briefings. The WF will provide pre-deployment weather briefings as requested. Briefing content will be tailored to meet customer requirements. For example, an aviation unit will receive weather impacts at the deployed location on their flying mission, in addition to the standard surface weather information usually presented to ground units. A ground-based unit will receive a briefing on surface temperatures, wind speed, potential for blowing sand and dust, and precipitation.

4.2.5. Climatology Services. WF will provide climatological information when requested.

4.3. Staff Integration Functions. WF leadership will ensure their unit is adequately resourced to meet both operational and staff requirements. In addition to leadership and management of unit activities, these unit members will also function as a direct interface with the supported unit commander and staff, and provide direct support to command, control and planning functions. Specific integration with base agencies is outlined below.

4.3.1. 319 RW/XP. The WF will assist in periodic exercises tailored to upcoming seasonal weather or other environmental concerns and will educate base agencies on the purpose and applicability of weather watches, warnings and advisories.

4.3.2. 319 RW/CP. The WF will notify the command post whenever the base weather station is evacuated and/or the AOL is activated.

4.3.3. 319 RW/PA. The WF provides tours of the base weather station for community groups and others when coordinated by PA.

4.3.4. 319 OSS/OSAA. The OWS or WF provides notification of all forecasted weather watches, warnings, and advisories via Integrated Weather Warnings Capability (IWWC), telephone, e-mail, or in-person during airfield hours of operations.

4.3.4.1. The WF will notify the OSAA whenever the base weather station is evacuated and/or the AOL is activated.

4.3.4.2. WF leadership will participate as a member of the Airfield Operations Board (AOB) as directed in AFI 13-204 Vol III, Airfield Operations Procedures and Programs.

4.3.5. 319 OSS/OSAB.

4.3.5.1. The WF provides notification of all weather watches, warnings, and advisories via IWWC/telephone/or e-mail.

4.3.5.2. The WF will notify the OSAB whenever the base weather station is evacuated and/or the AOL is activated.

4.3.6. 319 CES. The WF will provide a monthly climatology report.

4.3.7. All Supported Flying Units. The WF will provide services as outlined throughout this publication.

4.4. Reciprocal Support.

4.4.1. 319 RW/CP.

4.4.1.1. Ensure dissemination of weather watches, warnings, and advisories as outlined in **Chapter 2** of this instruction.

4.4.1.2. Notify the WF forecaster-on-duty immediately of all aircraft emergencies, incidents, or accidents.

4.4.1.3. CP will run applicable Quick Reaction Checklists (QRCs) to notify wing leadership and various base agencies of severe weather when notified by the OWS or the WF.

4.4.1.4. CP will activate sirens for a tornado when a tornado WARNING is issued.

4.4.1.5. Immediately notify the WF duty forecaster of any aircraft or ground mishaps (weather-related or not) requiring OPREP-3 reporting or local reporting requirements IAW AFI 10-206.

4.4.2. 319 RW/PA. Coordinate tours of the WF by community groups and others with the WF NCOIC or Superintendent.

4.4.3. 319 OSS/OSAA.

4.4.3.1. Notify WF personnel of in-flight, ground emergencies, or mishaps and termination via the secondary crash network.

4.4.3.2. Ensure dissemination of weather warnings and advisories as outlined in **Chapter 2** of this instruction.

4.4.4. 319 OSS/OSAB.

4.4.4.1. Participate in CWW.

4.4.4.2. Notify the WF of all changes in active runway.

4.4.4.3. Notify the WF of any light setting changes on the high-intensity runway lights.

4.4.4.4. Relay pilot weather reports to weather personnel.

4.4.4.5. Provide control tower orientation training for weather personnel.

4.4.4.6. Provide radio checks to ensure proper PMSV operation.

4.4.5. 319 RW/SE. Request a Grand Forks AFB WF briefer for seasonal weather briefings if required and provide 2 weeks advance notice when possible.

4.4.6. 319 OSS/OSAM.

4.4.6.1. Provide, coordinate, or arrange for the installation, calibration, maintenance, and repair of all weather meteorological sensing equipment.

4.4.6.2. Ensure scheduled maintenance does not degrade METWATCH and/or MISSIONWATCH performed by the WF during periods of inclement weather and notify the weather technician prior to routine maintenance.

4.4.6.3. Utilize the restoration priorities for weather meteorological sensing equipment outlined in this document.

4.4.6.4. Notify the responsible service agents for weather meteorological sensing equipment outages.

4.4.6.5. Coordinate with WF shift supervisor prior to taking any equipment down for maintenance.

4.4.7. 319 CS.

4.4.7.1. Provide, coordinate, or arrange for the installation, maintenance, and repair of all weather communications (e.g. phone lines, LAN/internet connectivity, maintaining FBWOS fiber optics).

4.4.7.2. Coordinate with off-base agencies to repair off base lines.

4.4.7.3. Perform necessary follow-up actions as required until full service is restored.

4.4.7.4. Ensure weather data and telephone circuits are assigned repair priorities.

4.4.7.5. Ensure established maintenance response times are met.

4.4.7.6. Ensure a 24-hour point of contact for reporting outages and assigning job control numbers is available.

4.4.8. 319 CES. Contact the WF Chief to request climatological data and specialized support for projects on Grand Forks AFB.

4.4.9. 319 SFS. Promptly inform the WF of any hazardous weather reported by Security Forces personnel (e.g. tornado, hail, etc.).

4.4.10. All Supported Flying Units.

4.4.10.1. Notify weather technician of current and planned weather alternates and any special considerations affecting duration of tour (i.e., weather categories, exercise/deployment considerations, etc.).

4.4.10.2. Notify the WF of required additional support as soon as it becomes known to include monitoring of alternate observations/forecast and tracking of weather conditions affecting local flying operations.

4.4.10.3. Provide timely notification of changes to scheduled operations affecting weather support requirements as soon as the change is identified.

4.4.10.4. Provide PIREPS to the WF through the PMSV, tower, telephone, or MIRC.

4.4.10.5. Provide feedback on all weather briefings via e-mail or survey to the WF.

4.4.10.6. Provide guidance (at least 2 weeks in advance) to the WF regarding any weather training/educational requirements (or changes in requirements) if applicable.

4.4.11. Airfield Management Flight Information Publication (FLIP) Manager. The FLIP manager will submit FLIP updates provided by the WF to Air Force Flight Standards Agency/Operating Location-D (AFFSA)/OL-D.

4.4.12. 319 MDOS/SGOJ (Bioenvironmental Engineering). Derives and disseminates thermal stress conditions (Wet Bulb Globe Temperature (WBGT) and cold stress) as required. DSN 362-5596.

4.4.13. All Weather Support Recipients.

4.4.13.1. Notify WF through proper chain of command when new weather support requirements are identified.

4.4.13.2. Coordinate changes/additions to weather support requirements as soon as they are foreseen.

Chapter 5

WEATHER EQUIPMENT.

5.1. General. This chapter provides a brief description of the meteorological and communications equipment used by the WF. Additionally, it provides information on backup systems, maintenance, and restoring priorities.

5.2. Meteorological Equipment & Software Systems. The WF uses the FMQ-19 and Gibson Ridge (GR) weather radar software to determine the current state of the atmosphere. These critical systems provide customers the most timely, accurate, and relevant weather intelligence possible.

5.2.1. FMQ-19. The FMQ-19 samples, measures, and reports: temperature, wind speed and direction, visibility, cloud base height and amount of coverage, pressure, liquid equivalent precipitation accumulation, the number and direction of lightning strikes from the airfield, and ice accretion during freezing precipitation. These measurements are processed to create properly formatted, fully automated observations that comply with applicable various reporting standards and protocols defined in the Federal Meteorological Handbook (FMH-1), the World Meteorological Organization (WMO), the Federal Aviation Administration (FAA), National Weather Service (NWS), and military reporting standards.

5.2.2. Kestrel 5500. The Kestrel is a hand-held weather observing device that measures wind speed, temperature, and pressure. It does not have the precision of other equipment and will be used as a short-term backup device only.

5.2.2.1. Kestrel 5500 with Kestrel LiNK. This device is the same as the Kestrel 5500, but also includes wireless data connectivity via Bluetooth that enables remote viewing of the data through the Kestrel LiNK application.

5.2.3. TMQ-53 (TMOS). The TMQ-53 TMOS is a tactical weather observing instrument suite that is used by the WF during contingency and exercise operations. The TMQ-53 provides a capability that is very similar to the FMQ-19. During long-term FMQ-19 outages, the TMQ-53 can be used as backup.

5.2.4. Gibson Ridge Radar (GR). The WF utilizes the web-based GR software application system as its primary source of radar data. This system allows weather technicians to analyze complex radar signatures and obtain detailed information on storm intensity, movement, internal circulation, and general wind flow. Weather technicians will routinely incorporate the latest radar information into all mission weather and resource protection products.

5.2.5. Mark IV-B. The WF utilizes the web-based Mark IV-B software application system as its primary source of satellite data. This system allows weather technicians to view weather systems as they develop and progress. It provides weather technicians the ability to determine cloud pattern locations and movements critical to the forecast and eyes forward process. The WF utilizes the 15 OWS web-page (or another OWS) and AFW-WEBS as back-up sources for satellite imagery.

5.3. Communications Equipment. The following systems are the backbone of the WF communications network:

5.3.1. Joint Environmental Toolkit (JET). As discussed in **para 2.5** of this instruction, JET is the primary system for disseminating forecasts, observations, warnings, watches, and advisories. Telephones are used as a backup for key aircraft controlling agencies.

5.3.2. PMSV Radio. The PMSV Radio (343.5 MHz) allows the WF to communicate with aircrews, both on the ground and flying, as well as tower personnel. If the PMSV is out-of-service, Airfield Management will be notified so a NOTAM can be disseminated. In the meantime, aircrews can contact Grand Forks AFB Weather at 343.5 MHz, the Grand Forks AFB Tower at 124.9 MHz or 349.0 MHz, or the OWS via phone patch (where possible) to get weather data.

5.3.3. Phones/Hotlines. Phones and hotlines serve primarily for rapidly passing along critical, time-sensitive information, as well as for backup services.

5.3.4. Local Area Network (LAN). The WF relies heavily on the LAN to improve the timeliness and accuracy of weather intelligence to our customers.

5.4. Maintenance. Table 5.1. Identifies which organizations provide preventive maintenance and repair weather and communications equipment.

Table 5.1. Equipment Maintenance List.

Organization	Equipment
319 OSS/OSAM (Airfield Systems)	FMQ-19
319 OSS/OSAM (Airfield Systems)	TMQ-53
557 WW Fielded Systems Support Cell (FSSC)	JET
319 CS/SCOI (Telephone Systems)	Phones/Hotlines
319 CS/SCOI (Network Maintenance)	LAN/Internet Connectivity

5.4.1. Restoral Priorities. Priorities for restoring critical systems in the event natural disasters or any other anomaly, simultaneously impacting systems base wide. Significant indicates a situation where the equipment is completely inoperative, while minimal means the equipment is in limited operation. The priorities for weather equipment are listed in **Table 5.2** below (priorities may be adjusted based on forecasted weather):

Table 5.2. Equipment Restoral Priorities.

Equipment	Organization	Response Times Significant/Minimal
PMSV Radio	319 CS/SCOT	Immediate/24 hours
FMQ-19	319 OSS/OSAM	Immediate/24 hours
LAN/Internet Connectivity/Phones/Hotlines/JET	319 CS/SCOI	Immediate/12 hours

5.5. Building Power. In the event of a commercial power interruption, Bldg. 528 will automatically switch to a backup generator.

5.6. Grand Forks Data Page .

To view data, please reference **https://15ows.us.af.mil/tech_ref/idp/index.cfm?icao=KRDR**.

CAMERON S. PRINGLE, Col, USAF
Commander

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFI 10-206, *Operational Reporting*, 21 July 2016

AFI 10-2501, *Air Force Emergency Management (EM) Program*, 26 September 2018

AFI 11-2RQ-4V3, *RQ-4/EQ-4 Operations Procedures*, 16 April 2013

AFI 11-202V3, *General Flight Rules*, 10 August 2016

AFI 13-204V3, *Airfield Operations Procedures and Programs*, 20 May 2019

AFI 15-114, *Weather Technical Readiness Evaluation*, 16 March 2017

AFI 15-127, *Weather Training*, 26 September 2018

AFI 15-128, *Weather Force Structure*, 07 May 2019

AFMAN 11-210, *Instrument Refresher Program (IRP)*, 01 September 2017

AFMAN 15-111, *Surface Weather Observations*, 12 March 2019

AFMAN 15-124, *Meteorological Codes*, 16 January 2019

AFMAN 15-129V1, *Air and Space Weather Operations- Characterization*, 21 March 2017
AFMAN 15-129V2, *Air and Space Weather Operations-Exploitation*, 24 March 2017

AFMAN 33-363, *Management of Records*, 31 May 2019

AFPD 15-1, *Air Force Weather Operations*, 12 November 2015

GFAFBI 10-103, *Responding to Severe Weather Events*, 03 December 2015

OSAA OI 13-204, *Airfield Management*, 28 September 2016

Adopted Forms

DD Form 175-1, *Flight Weather Briefing*

Abbreviations and Acronyms

AOB—Air Operations Board

RW—Reconnaissance Wing

RW/XP—Wing Plans & Programs

ACC—Air Combat Command

AFI—Air Force InstructionAFMAN—Air Force ManualAFB—Air Force Base

AFPD—Air Force Policy Directive

AFFSA—Air Force Flight Standards Agency

AFW-WEBS—Air Force Weather Web Services

AGL—Above Ground Level

AOL—Alternate Operating Location

AOR—Area of Responsibility

AS—Airlift Squadron

ATC—Air Traffic Control

BCR—Business Continuity Rules

CAT—Crisis Action Team

CB—Cumulonimbus

CBT—Computer-Based Training

CBRN—**-**Chemical, Biological, Radiological, and Nuclear Defense

CC—Commander

CES—Civil Engineer SquadronCONUS—Continental United StatesCP—Command Post

CU—Characterization Unit

CS—Communications SquadronCWW—Cooperative Weather WatchDA—Density Altitude

DPD—Dew Point Depression

DSNT—Distant

ESTMD—Estimated

EU—Exploitation Unit

EWO—Emergency War Orders

FAA—Federal Aviation Administration

FBWOS—Fixed Base Weather Observing System

FLIP—Flight Information Publication

FMH—Federal Meteorological Handbook

FSSC—Fielded Systems Support Cell

GDSS—Global Decision Support System

GR—Gibson Ridge

IAW—In Accordance With

ICAO—International Civil Aviation Organization

ICC—Installation Control Center

IRC—Instrument Refresher Course

IWWC—Integrated Weather Warnings Capability

JET—Joint Environmental Toolkit

KT—Knots

LAN—Local Area NetworkLTG—Lightning

LWR—Lower

MDT—Moderate

MEF—Mission Execution Forecast

METAR—Meteorological Terminal Aviation Routine Report

METSAT—Meteorological Satellite

METWATCH—Meteorological Watch

mIRC—Microsoft Internet Relay Chat

MOV—Moving

MOVD—Moved

MWP—Mission Weather Product

NCOIC—Non-Commissioned Officer in Charge

NM—Nautical Mile

NWS—National Weather Service

NOTAM—Notice to all Airmen

OHD—Overhead

OL-D—Operating Location-D

OPREP—Operational ReportingOSAA—Airfield Management

OSAB—Tower

OSAM—Airfield Systems

OSS—Operations Support Squadron

OSW—Operations Support Weather

OWS—Operational Weather Squadron

PA—Public AffairsPIREP—Pilot ReportPK WND—Peak Wind

PMSV—Pilot-to-Metro Service

RG—Reconnaissance Group

RPA—Remotely-piloted aircraft

RVR—Runway Visual RangeRWY—Runway

SE—Safety Office

SFS—Security Forces SquadronSM—Statute Mile

SOP—Standard Operating Procedure

SPECI—Selected Special Weather Report

SWAP—Severe Weather Action Procedures

SWS—Special Weather Statement

TACC—Tanker Airlift Control Center

TAF—Terminal Aerodrome Forecast

TCU—Towering Cumulus

TMOS—Tactical Meteorological Observing System

TWR—Tower

UFN—Until Further Notice

UHF—Ultra High FrequencyUNKN—Unknown

VHF—Very High FrequencyVIS—Visibility

WBGT—Wet Bulb Global Temperature

WF—Weather Flight

WMO—World Meteorological Organization

WSHFT—Wind Shift

WSR-88D—Weather Surveillance Radar, 1988 Doppler

WW—Weather Wing

WWA—Watch, Warning, Advisory

Attachment 2

SPECIAL WEATHER OBSERVATION CRITERIA

A2.1. A Special weather observation will be taken and disseminated for listed criteria:

A2.1.1. **Visibility.** When the prevailing visibility decreases below or, if below, increases to equal or exceeds any of the values listed below:

Table A2.1. Visibility Levels.

Visibility (Statute Miles)	
3	(AFMAN/FLIP)
2	(AFMAN/FLIP/LOCAL POLICY)
1 1/2	(AFMAN/FLIP)
1	(AFMAN/FLIP)
3/4	(AFMAN/FLIP)
1/2	(AFMAN/FLIP)
1/4	(AFMAN)

A2.1.2. **Ceiling.** When the ceiling goes below or, if below, increases to equal or exceeds any of the values listed below:

Table A2.2. Ceiling Levels

Ceiling (ft AGL)	
3,000	(AFMAN)
2,000	(AFMAN)
1,500	(AFMAN)
1,200	(FLIP)
1,000	(AFMAN/LOCAL POLICY)
800	(AFMAN)
700	(AFMAN)
600	(FLIP)
500	(AFMAN/FLIP)
400	(FLIP)
300	(AFMAN)

200	(AFMAN/FLIP)
100	(AFMAN)

A2.1.3. **Sky Condition.** Sky condition is a description of the celestial dome as seen from a single point on the surface of the earth and is reported with relation to what could be seen if there was an unobstructed view from horizon to horizon.

A2.1.4. **Wind.** Wind is the perceptible natural movement of the air, especially in the form of a current of air blowing from a particular direction.

A2.1.4.1. **Shifts.** Wind direction changes by 45 degrees or more in less than 15 minutes and the wind speed is 10 knots or more throughout the wind shift.

A2.1.4.2. **Squall.** A strong wind characterized by a sudden onset in wind speed increasing at least 16 knots and sustained at 22 knots or more for at least 1 minute. A SPECI is not required to report a squall if one is currently in progress.

A2.1.5. **Volcanic Eruption.** Eruption or volcanic ash cloud first noted. Only a single-element special observation is needed.

A2.1.6. **Thunderstorm.** a storm with thunder and lightning and typically also heavy rain or hail.

A2.1.6.1. Begins (**Note:** A Special observation is not required to report the beginning of a new thunderstorm if one is currently reported as in progress at the airfield).

A2.1.6.2. Ends (**Note:** 15 minutes after the last occurrence of criteria for a thunderstorm; an audible sound of thunder, lightning within 5 NM of the airfield, etc.).

A2.1.7. **Precipitation** .

A2.1.7.1. Hail begins or ends.

A2.1.7.2. Freezing precipitation begins, ends, or changes intensity.

A2.1.7.3. Ice pellets begin, end, or change in intensity.

A2.1.7.4. Any other type of precipitation begins or ends. **Note:** Except for freezing rain, freezing drizzle, hail, and ice pellets, a Special observation is not required for changes in type (e.g., drizzle changing to snow grains) or the beginning or ending of one type while another is in progress (e.g., snow changing to rain and snow).

A2.1.8. **Tornado, Funnel Cloud, or Waterspout. Note:** Only a single-element special observation is needed.

A2.1.8.1. Observed and/or disappears from sight.

A2.1.9. **Runway Visual Range (RVR).** WF will provide RVR output according to the specifications listed in **Table A2.3**

Table A2.3. RVR Reporting.

Runway Visual Range (RVR)
□ Prevailing visibility first observed < 1 SM/1600 meters, again when prevailing visibility goes above 1 SM/1600 meters.
□ RVR for active runway decrease to less than or, if below, increase to equal or exceed: -6,000 feet (P1500 meters) - 5,000 feet (1500 meters) - 4,000 feet (1300 meters) - 2400 feet (0750 meters)
- 1,500 feet (0460 meters) - 1,400 feet (0420 meters) - 1,300 feet (0400 meters) - 1,200 feet (0360 meters) - 1,100 feet (0340 meters)
□ RVR is first determined as unavailable (RVRNO) for the runway is use, and when it is first determined that the RVRNO report is no longer applicable, provided conditions for reporting RVR exist.

A2.1.10. **Tower Visibility.** Transmit a SPECI with the tower visibility as a remark:

A2.1.10.1. When notified by the control tower that tower visibility has decreased to less than or, if below, increased to equal or exceed 1, 2, or 3 statute miles, 1600, 3200 or 4800 meters (IAW FAA JO 7110.65V, *Air Traffic Control*) and the control tower visibility differs from the prevailing visibility.

A2.1.10.2. When notified by the control tower that tower visibility has decreased to less than or, if below, increased to equal or exceed locally developed tower special criteria (if applicable) and the control tower visibility differs from the prevailing visibility.

A2.1.11. **Upon Resumption of Observing Services.** Take, disseminate, and record a SPECI within 15 minutes after returning to duty following a break in hourly coverage, if a METAR was not filed as scheduled during the 15-minute period.

A2.1.12. **Aircraft Mishap.** When notified of an aircraft mishap, the WF will check the latest AN/FMQ-19 observation (i.e., METAR/SPECI/OMO (one minute observation) and perform augmentation/back-up if required. When operating in a back-up mode WF will immediately take a SPECI observation IAW AFI 15-111.

A2.1.13. Any other meteorological situation that, in the weather technician's opinion, is critical.

Attachment 3

FORECAST SPECIFICATION AND AMENDMENT CRITERIA

A3.1. TAFs specify the onset, duration, and intensity for the criteria listed below. TAFs are amended when forecast/observed conditions do not match conditions specified in the TAF.

A3.1.1. Ceiling and/or Visibility**.** Forecast to decrease to less than; if below, is forecast to increase to equal or exceed the thresholds listed in **table A3.1**

Table A3.1. Ceiling and Visibility Specification and Amendment Criteria

Ceiling	Visibility
2,000 FT	3 SM (4,800 M)
1,000 FT	2 SM (3,200 M)
700 FT	2 SM (3,200 M)
200 FT	1/2 SM (800 M)

A3.2. Surface Winds.

A3.2.1. The difference between the predominant speed and the forecast speed is ≥ 10 knots.

A3.2.2. The difference between the observed gusts and the forecast gusts is ≥ 10 knots.

A3.2.3. A change in the predominant direction of > 30 degrees when the wind speed or gusts are forecast to be ≥ 15 knots.

A3.3. Icing.

A3.3.1. Not associated with thunderstorms, from the surface to 10,000ft above ground level.

A3.3.2. When the beginning or ending of icing first meets, exceeds, or decreases to less than moderate (or greater) thresholds and was not specified in the forecast.

A3.4. Turbulence.

A3.4.1. Turbulence for category II aircraft, not associated with thunderstorms, from the surface to 10,000ft above ground level.

A3.4.2. When the beginning or ending of turbulence first meets, exceeds, or decreases to less than moderate (or greater) thresholds and was not specified in the forecast.

A3.5. Weather Warning and Forecast Weather Advisory Criteria.

A3.5.1. Occur, or are expected to occur during the forecast period, but were not specified in the forecast.

A3.5.2. Specified in the forecast but are no longer expected to occur during the forecast period.

A3.6. Altimeter Setting.

A3.6.1. If below, increases to meet or exceed 31.00 INS and was not specified during the forecast period.

A3.6.2. If above, decreases to less than 31.00 INS and was not specified during the forecast period.

A3.6.3. If above, decreases to less than 28.00 INS and was not specified during the forecast period.

A3.6.4. If below, increases to equal or exceed 28.00 INS and was not specified during the forecast period.

A3.7. Thunderstorms. If the start or end time is incorrectly forecast.

A3.8. Temporary Conditions.

A3.8.1. Conditions specified as temporary become predominant.

A3.8.2. Conditions specified as temporary do not occur during the cardinal hour as forecast.

A3.8.3. Conditions specified as temporary are no longer expected to occur.

A3.9. Predominant Conditions.

A3.9.1. Change in conditions occurs before the beginning of the specified period of the change and are expected to persist.

A3.9.2. Change in conditions does not occur within 30 minutes after the specified time.

A3.9.3. Change in conditions are no longer expected to occur.

A3.10. Representative Conditions. Conditions are not considered representative of existing or forecast conditions and amending the forecast improves safety, flight planning, operations efficiency, or assistance to an in-flight emergency.

Attachment 4

SAMPLE WEATHER PRODUCT DISSEMINATION FORMAT/INTERPRETATION OBSERVATION/TAF/WWAS

Table A4.1. Sample Weather Observations.

1	2	**3**	4	**5**	6	**7**	8	**9**	10
SPECI KRDR **1506Z** AUTO **17013G22KT** 2 1/2 **RVRNO** TSRA **BKN015CB OVC030** 76/75									
ALSTG 29.99 RMK AO2 TS OHD MOV NE									
11				12					

Table A4.2. Body of Report – Consists of 11 Groups.

Group	Reference	Brief Description
Type of Report	A5.1.	Indicates type of report.
Station Identifier	A5.2.	A four-character group used to identify the observing location.
Date and Time of Report	A5.3.	Date and time of the report.
Report Modifier	A5.4.	A report modifier **(COR**) identifying report as a correction, or **AUTO** indicating the weather observation is a fully automated report with no human intervention.
Wind	A5.5.	Indicates wind direction and speed.
Visibility	A5.6.	Provides prevailing visibility from the designated point of observation in statute miles or meters.
Runway Visual Range	A5.7.	10-minute RVR or varying RVR in hundreds of feet or meters.
Present Weather	A5.8.	Any weather occurring at the observing location, obscurations to vision, or other phenomena.
Sky Condition	A5.9.	State of the sky in terms of sky cover, layers and heights, ceilings and obscurations.
Temperature and Dew Point	A5.10.	Measure of hotness/coldness of ambient air. Dew point measures saturation point temperature.
Altimeter	A5.11.	Indicates altitude above MSL of an aircraft on the ground.
Remarks	A5.12.	Remarks generally elaborate on parameters reported in the body of the report, and will be included in all METAR and SPECI observations.

A4.1. Type of Report. METAR or SPECI.

A4.2. Station identifier, also called the ICAO. This code identifies the location of the observation (in this case Grand Forks AFB).

A4.3. Date and Time of Report. This is in Zulu (GMT) of the last element of the observation.

A4.4. Report Modifier. The report modifier can be either of the following two elements:

A4.4.1. COR is entered into the report modifier group when a corrected METAR or SPECI is transmitted.

A4.4.2. AUTO identifies the report as a fully automated report with no human intervention.

A4.4.2.1. AUTO is automatically included in reports when the weather technician signs off the automated dissemination system (JET) indicating the observations are no longer being augmented.

A4.4.2.2. AUTO and COR will not be seen in the same observation. If the term COR is used, the observation cannot be reported as AUTO, since a weather technician is manually correcting the observation.

A4.5. Wind. The true direction the wind is blowing from is encoded in tens of degrees using three figures. Directions less than 100 degrees are preceded with a "0." The wind speed is entered as a two or three digit group immediately following the wind direction.

A4.5.1. **Gust.** The wind gust is encoded in two or three digits immediately following the wind speed. The wind gust is encoded in whole knots using the units and tens digits and, if required, the hundreds digit.

A4.5.2. **Variable Wind Direction (speeds 6 knots or less).** Variable wind direction with wind speed 6 knots or less may be encoded as VRB in place of the direction.

A4.5.3. **Variable Wind Direction (speeds greater than 6 knots).** Wind direction varying 60 degrees or more with wind speed greater than 6 knots will be encoded. The variable wind direction group will immediately follow the wind group. The directional variability will be encoded in a clockwise direction. For example, if the wind is variable from 180 degrees to 240 degrees at 10 knots, it would be encoded 21010KT 180V240.

A4.5.4. **Calm Wind.** Calm wind is encoded as 00000KT.

A4.6. Visibility. The furthest predominant distance (at least 50% of the aerodrome) seen from the airfield reported in statute miles. The most common visibility reported is 7 miles.

A4.7. Runway Visual Range.

A4.8. Present weather. Any weather phenomenon occurring on the airfield. This is mandatory anytime the visibility is less than 7 miles. **Table A4.2** lists the present weather codes:

Table A4.3. Weather Phenomena Codes.

QUALIFIER		WEATHER PHENOMENA		
INTENSITY OR PROXIMITY 1	DESCRIPTOR 2	PRECIPITATION 3	OBSCURATION 4	OTHER 5
- Light	MI shallow	DZ Drizzle	BR Mist	PO Well-Developed Dust/Sand Whirls
Moderate	PR Partial	RA Rain	FG Fog	
+ Heavy	BC Patches	SN Snow	FU Smoke	SQ Squalls
VC - In the Vicinity	DR Low Drifting	SG Snow Grains	VA Volcanic Ash	FC Funnel Cloud(s) (including a Tornado, or Waterspout)
	BL Blowing	IC Ice Crystals	DU Widespread Dust	
	SH Shower(s)	PL Ice Pellets	SA Sand	SS Sandstorm
	TS Thunderstorm	GR Hail	HZ Haze	DS Dust Storm
	FZ Freezing	GS Snow Pellets	PY Spray	
Note: For airfields operating an ASOS, the shaded elements in this table indicate qualifier/phenomena or combinations that are not possible and will not be reported due to restrictions in the current software configuration. **(T-0).** Manual or augmented observations created on an ASOS will contain these elements if permitted by a future software upgrade. **(T-0).**				

A4.9. Sky Condition and Cloud Height. Describes the amount of clouds present at the airfield and the base of each cloud deck. They fall into the following categories:

A4.9.1. SKC – Sky Clear.

A4.9.1.1. FEW – 1/8 to 2/8 coverage.

A4.9.1.2. SCT – Scattered; 3/8 to 4/8 coverage. **A4.9.1.3** BKN – Broken; 5/8 to 7/8 coverage.

A4.9.1.4. OVC – Overcast; 8/8 coverage.

A4.9.1.5. VV – Vertical visibility; normally used during heavy fog, indicates how far up into the fog can be seen.

A4.9.1.6. FEW000 – Surface-based obscuration.

A4.10. Cloud Height. Three-digit number provides the height of the base of the cloud in hundreds of feet (e.g., 015 equals 1,500 feet). The CB and TCU descriptors may be appended to the cloud height to indicate the cloud is a cumulonimbus or towering cumulus.

A4.11. Temperature and Dew Point (i.e., can be in degrees, either Fahrenheit or Celsius.

A4.12. Altimeter Setting. The current value aircraft altimeters must be set at to read an elevation of zero. The altimeter is measured in inches (INS) of mercury.

A4.13. Remarks. Table A4.3 contains some of the most commonly seen remarks in observations:

Table A4.4. Remarks Listing.

AO2—Automated sensor indicator
CB—Cumulonimbus
DSNT—Distant
ESTMD—Estimated
FROPA—Frontal Passage
LTG—Lightning
LWR—Lower
MOV—Moving
MOVD—Moved
OHD—Overhead
PK WND—Peak Wind
PRESFR—Pressure Falling Rapidly
PRESRR—Pressure Rapidly Rising RWY—Runway
TCU—Towering Cumulus
TWR—Tower
UNKN—Unknown
VIS—Visibility
WSHFT—Wind Shift
PA—Pressure Altitude
DA—Density Altitude

A4.14. TAF:

Table A4.5. Sample TAF.

TAF KRDR 1018/1124 03012KT 9999 OVC070 620705 QNH3014INS TEMPO 1018/1101 02015G25KT
BECMG 1108/1109 36009KT 9999 FEW040 SCT090 QNH3029INS TX13/1020Z TN03/1110Z
TAF KRDR 1018/1124 03012KT 9999 OVC070 620705 QNH3014INS TEMPO 1018/1101 02015G25KT
BECMG 1108/1109 36009KT 9999 FEW040 SCT090 QNH3029INS TX13/1020Z TN03/1110Z

A4.14.1. The forecast follows the same general format as the observation with the following exceptions noted :

A4.15. Valid Date/Time. Forecasts are valid for a 30-hour period. In this example, the forecast is valid from the tenth at 1800Z until the 11th at 2400Z.

A4.16. BECMG – This is a code to indicate the predominant conditions will change to (or become) the conditions listed in the line of the forecast. The conditions will change during the time period follows the BECMG code (11/0800Z to 0900Z in the example above).

A4.17. TEMPO – This code means the conditions listed on the line may occur for periods of 30 minutes or less (45 minutes or less for thunderstorms) anytime between the time frame following the TEMPO code (10/1800Z to 11/0100Z in this example).

A4.18. Max Temp/Min Temp. TX13/1020 indicates a maximum temperature of 13 Celsius to occur on the 10th at 20Z. TN03/1110Z indicates a minimum temperature of 03 Celsius to occur on the 11th at 10Z (**Note:** M indicates a minus sign in front of the number: M05 = -5 C). Weather Warning for Grand Forks AFB (KRDR) (KRDR) valid 10/1423L UFN Observed Lightning observed at 5 nm.

A4.19. Weather Warnings, Watches, and Advisories.

Table A4.6. Observed Weather Warning

Weather Warning for Grand Forks AFB (KRDR) (KRDR) valid 10/1423L UFN
Observed Lightning observed at 5 nm.

Attachment 5

CUSTOMER RESPONSE MATRIX

Table A5.1. Customer Response Matrix

Weather Phenomena	Lead Time	Impact	Customer Action
Tornado	15 min	Severe damage to aircraft, structures and personnel	Seek shelter in interior bathrooms; stay away from windows.
Hail (≥ ¾ inch)	60 min	Personal injury/death Equipment damage	Seek shelter; hangar or divert aircraft
Freezing Precipitation	60 min	Flight and vehicle operations hazard. Personnel slipping hazard	Cease flying; hangar or protect aircraft; check road conditions for travel on and off base.
Blizzard	60 min	Severely effects flight operations, vehicular and pedestrian traffic	Cease flying; stay indoors and have an emergency preparedness kit in vehicle when traveling; check road conditions before traveling; travel not advised: do so only if absolutely necessary.
Surface winds > 50 KTS	60 min	Personal injury, structure and equipment damage. Flight hazard	Cease unnecessary flying; secure or hangar aircraft; secure light objects outside; stay away from windows and take cover in interior bathrooms
Winds ≥ 35 but < 49 KTS	60 min	Flight hazard Equipment damage	Cease unnecessary flying; secure or hangar aircraft
Winds ≥ 30 KTS	Observed	Flight hazard	Secure or hangar aircraft.
Winds ≥ 40 KTS	Observed	Flight hazard Equipment damage	Cease unnecessary flying; secure or hangar aircraft
Lightning w/in 5 NM of Grand Forks AFB	Observed	Personal injury/death Flight hazard	Cease flight-line work; clear pool/golf course; stay away from windows; do not use electrical equipment unless necessary.
Lightning w/in 10 NM	Observed	Personal injury/death Flight hazard	Move operations away from active thunderstorm activity; electrical equipment unless necessary.
Lightning w/in 20NM	Observed	Flight hazard	Move operations away from active thunderstorm activity.
Crosswinds ≥ 15 knots	Observed	Flight hazard	Cease take-off/landings for

			small private aircraft; no touch and goes
Temperature ≥ 90F	Observed	Flight Hazard Personnel injury	Hanger aircraft in cool location to protect sensitive electronics; ensure ground crew personnel stay hydrated and take frequent breaks in a shady area outside or in an air conditioned building.
Rain accumulation ≥ 2" in 12 hours	60 min	Flight Hazard Personnel injury	Get runway RCR updates for standing water; hanger aircraft to protect sensitive electronics; monitor road condition reports for flash flooding.
Snow accumulation ≥ 2" in 12 hours	60 min	Aircraft takeoff and landing hazard. Base roads and off base roads hazard.	Delay operations; Activate snow removal plan; hangar aircraft when possible; check road conditions for on and off base travel.
Equivalent Wind Chill Temp –15 to –33F	Observed	Personal injury Slowed/delayed outside work	Wear gloves & total body protection, cover metal handles and bars with thermal insulation, no outdoor operations with water (vehicle/aircraft washing), avoid heavy sweating, change wet clothes immediately Work 40 minutes; Rest 20 minutes in heated area
Equivalent Wind Chill Temp –34 to –47F	Observed	Personal injury/death Slowed/delayed outside work	Wear gloves & total body protection, cover metal handles and bars with thermal insulation, no outdoor operations with water (vehicle/aircraft washing), avoid heavy sweating, change wet clothes immediately Work 30 minutes; Rest 30 minutes in heated area

Equivalent Wind Chill Temp –48F or colder	Observed	Personal injury/death Slowed/delayed outside work	Wear gloves & total body protection, cover metal handles and bars with thermal insulation, no outdoor operations with water (vehicle/aircraft washing), avoid heavy sweating, change wet clothes immediately. **Mission critical work only (Unit Commander will determine which tasks are mission critical)** **Work no more than 15 minutes; Rest 45 minutes in heated area**
Any icing within 50 miles	Observed	Flight hazard	Cease or Delay operations; notify all UAV aircraft operators.
Moderate or greater turbulence within 50 miles	Observed	Flight hazard	Cease or Delay operations; notify all UAV aircraft operators.
Induction Icing Both criteria must be met: - Temp 20-40F - Dew point depression < 9F	Observed	Flight hazard	Cease or Delay operations; notify all UAV aircraft operators.

Attachment 6

FLYING UNITS SUPPORTED & MISSION LIMITING ENVIRONMENTAL CONDITIONS

Table A6.1. Flying Units Supported.

Organization	Mission	MWP Provider
DHS (Department of Homeland Security)	Provides operational support for ground and air search operations along the US-Canadian and US-Mexico borders.	DHS
69 RG	Provides reconnaissance services for war, peacetime, and contingency operations.	WF
348 RS	Provides reconnaissance services for war, peacetime, and contingency operations.	WF

A6.1. Mission Limiting Thresholds.

A6.1.1. **Airframe-Specific Weather Limitations. Tables A6.2 – A6.10** provide the general airframe weather limitations based on AFI 11-202V3, *General Flight Rules* and the limitations from aircraft specific AFI 11-2.

Table A6.2. USAF General Flight Rules Weather Limitations.

(Ref: AFI 11-202V3)		
Weather Condition	Impact	Customer Action
Cig/Vis < 2,000 / 3	Alternate required	Add fuel to allow divert
Cig/Vis < 1,000/ 2, if MAJCOM approved	Alternate required	Add fuel to allow divert
Cig/Vis < 500 / 2	Terminal not suitable for alternate	Select another alternate

Table A6.3. C-21A

Condition	Limit	Response Action
Dry Crosswind Landing	greater than 25KT	Delay or proceed to ALT
Dry Crosswind (Training Sortie)	greater than 25KT	Delay or proceed to ALT
Mountain Wave Turbulence	Observed or Forecast Moderate	Avoid
RVR	1000	No takeoffs

Table A6.4. RQ-4 Ceiling/Visibility Weather Parameters (Unclassified)

Mission	Weather Element	Minimums	Impact
RQ-4	CIG/VIS	1000/2	Divert, hold, or 69 OG/CC Waiver to land

Table A6.5. RQ-4 Maximum Wind Thresholds before NO GO (Unclassified)

Mission/Condition	Crosswind	Headwind	Tailwind
BQ/RQ	15 knots	30 knots	20 knots

A6.1.2. **Depending on weight:**

Table A6.6. RQ-4 General Flight Weather Parameters (Unclassified)

General Flight			
Weather Element		**Actions**	**Impact**
Icing	Any Icing	Avoid	No Go
Turbulence	LGT	Continuous Flight	Go
	≥ MDT	Climb or descend	Marginal
Thunderstorms	Above FL500, clear by 10,000’ vertical or 20nm laterally		Marginal
	Below FL500, clear by 20 nm or 10 nm along terminal routing		Marginal
Winds	30kts at >30 degrees off runway heading	Recall or divert training sorties	Marginal
	25kt tail wind for Operational or Higher HQTRS sorties	Recall or divert operational/higher HQTRS sorties	Marginal
	≥ 30kts	No taxi or tow	Marginal
	50 kts	Secure aircraft	No Go

Table A6.7. Maximum Crosswinds for all assigned aircraft

Takeoff Condition	**RQ-4**
Dry Runway	15 knots (300’ wide runway) 10 knots (150’ wide runway)
Wet Runway	[redacted]
Standing Water, or Patchy Ice on Runway	
Formation Takeoff	

Attachment 7

SPACE WEATHER IMPACTS

Figure A7.1. Space Environment Global Situational Awareness.