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WEATHER SUPPORT TO MAGTF OPERATIONS

STUDENT HANDOUT

I. Introduction

A. Lesson Purpose

1. To present a working knowledge of the mission, organization, employment, capabilities and limitations of the Meteorological Mobile Facility (METMF) and the Marine Expeditionary Force (MEF) Weather Support Team (MST).

2. To provide a general overview of initiatives within the Marine Corps Meteorological and Oceanographic (METOC) community to support MAGTF operations on the future battlefield.

B. References

1. Joint Publication 3-59, Joint Manual for Meteorological and Oceanographic Support

2. Joint Publication 3-59.1 (Draft), Joint Tactics, Techniques and Procedures for Meteorological and Oceanographic Support

3. CJCSI 3810.01, Meteorological and Oceanographic Support to Joint Forces

4. JCS Concept Paper (Draft), Concept of Future Joint Meteorology and Oceanography Operations (1995 to 2005)

5. FMFRP 3-29, U. S. Navy Oceanographic and Meteorological Support Manual

6. MCWP 3-35.7, MAGTF Meteorological and Oceanographic Support

7. NAVAIR (TM) 19-25-158, USMC Meteorological Mobile Facility Complex

8. Meteorological and Oceanographic Support Study (Final Report), MCCDC (C453), Aug 94

9. Thor's Legions; Weather Support to the U. S. Air Force and Army 1937 - 1987, Fuller 1990
10. Compton's New Century Encyclopedia, Version 2.0, New Media Inc., 1994

C. Enabling Learning Objectives

1. Without the aid of references, identify the acronym for “Meteorological and Oceanographic”.

2. Without the aid of references, choose the standard products that can be obtained from the MWSS Weather section and explain how this information can be used for planning and operations.

3. Without the aid of references, identify the purpose of the MEF Weather Support Team.

D. Appendices

1. Appendix A, Current METMF Complex
2. Appendix B, METMF (R)
3. Appendix C, Sample Weather Forecast (WEAX)
4. Appendix D, Sample Tactical Atmospheric Summary (TAS)
5. Appendix E, Sample Amphibious Objective Area Forecast (AOAFCST)
6. Appendix F, Sample Strike Forecast (STRKFCST)
7. Appendix G, Sample Assault Forecast (ASLTFCST)
8. Appendix H, Sample Climatology Brief
9. Appendix I, Sample Operational Brief
10. Appendix J, USMC Weather Points of Contact

E. Weather exerts constant influence on the readiness, morale, and effectiveness of military forces. Additionally, it can have a significant impact on the choice of military strategy, tactics and the performance of weapons systems. Even the most advanced, high performance, "all-weather" weapons systems and platforms are affected by the environment. Commanders and mission planners must consider weather in every facet of military planning, deployment, employment and system design and evaluation.

F. Historical. Weather has played an important role influencing combat operations throughout history. The rain soaked ground in southern Belgium prevented Napoleon from deploying his artillery early on the morning of June 18th, 1815. This delayed his planned opening of the battle of Waterloo by three hours. The delay may have been a critical factor, for Napoleon was on the verge of defeating Wellington's Allied forces when Bulcher's Prussian army arrived on the battlefield in time to turn the tide against the French.

In early June 1944, after a week of poor weather, the meteorologist on General Eisenhower's staff, Group Captain Staag of the RAF, forecast a 24-hour window of fair weather to begin on June 6th. Over 176,000 troops, on 5000 ships and craft participated in what was to date, the largest ever-amphibious assault. The original execution date of June 5th, for Operation Overlord, was rescheduled for the 6th of June and was successful. As predicted, the 7th was again stormy. Had the invasion been delayed beyond then, the required tidal and lunar conditions would not have been favorable until the 17th through the 21st of June. As it turned out, the worst June storm over the English Channel in 20 years occurred during that time frame.

The Korean War presented many worst-case weather scenarios for the United Nations Forces, which included the 1st Marine Division. Conditions ranged from hot, dry summers to bitterly cold winters and included natural disasters and some of the largest tidal ranges in the world. The timing for the amphibious landing at Inchon, South Korea on 15 September 1950 was severely hampered by low seas that were common during the period from May to August and the high seas that were predominant from October through March. The transitional month of September afforded the only reasonable/practical time to conduct the landing. It was however, not without challenges and risks as the tidal range during this period was 27.1 feet. A three-day window of opportunity occurred during which only 3 to 4 hours per day could be used to embark forces and equipment ashore. If the landing had not been conducted during this narrow window, it would have been October before tidal conditions would allow a landing. By then a unique strategic opportunity would have been lost.

II. Body

A. Definitions. An understanding of the following definitions will be useful during the remainder of this discussion.

1. METOC. Acronym for Meteorological and Oceanographic. An all encompassing (joint) term used to incorporate all facets of services; meteorological, oceanographic and space environmental support programs that provide information on the whole range of atmospheric, oceanographic, and space environmental phenomena from the bottom of the earth's oceans to the space environment.

2. METOC Forces and/or Personnel. Personnel trained to provide meteorological, oceanographic, or space environmental support. Does not imply personnel are necessarily capable of providing all three types of support.

3. METOC Information. Meteorological, oceanographic, and space environment observations, analyses, and climatological and prognostic information.

4. METOC Support. Provision of METOC information, products and services.

5. JMFU. Acronym for Joint METOC Forecast Unit. A flexible, transportable, jointly supported collective of meteorological and oceanographic personnel and equipment formed to provide a Joint Force Commander (JFC) and Joint METOC Officer (JMO) with full METOC services.

B. Fleet Marine Force (FMF) METOC support units are under the management and operational control of the respective Marine Force's (MARFOR) commander. These METOC support units are assigned to designated Marine Aircraft Wings (MAW) and are integral to the Marine Wing Support Squadrons (MWSS). METOC support elements within each MWSS include the Meteorological Mobile Facility (METMF) and a MEF Weather Support Team (MST). The appropriate mix, task organization and employment of these METOC elements within the MAW are capable of providing the necessary levels of sustained support and services to the MAGTF.

C. Mission. At the present time, HQMC has not officially promulgated a mission statement or concept of employment. An extensive study of the 68XX occupational field was recently concluded and is being reviewed by MCCDC (C442), various departments at HQMC and agencies within DOD. The concepts presented here are based on a combination of historical precedence, adopted operational and procedural guidance, and implied tasks and responsibilities.

1. Meteorological Mobile Facility (METMF). Provide all essential aviation METOC support for tactical operations at Forward Operating Bases (FOB).

2. MEF Weather Support Team (MST). Provide limited METOC support to MAGTF elements other than the ACE and to Marine Expeditionary Unit (MEU) operations.

D. Concept of Employment. The Marine Wing Support Group (MWSG) mission is to perform all support functions identified in their mission statement for the ACE Command Element and Headquarters. Within the MWSG there are up to four MWSSs, designated as fixed wing or rotary wing squadrons. The MWSS provides essential ground support and selected combat service support to the ACE and all supporting or attached elements of the Marine Air Control Group (MACG).

1. METMF Complex. The METMF complex is a component and function of the Airfield Operations Division. It is task organized and equipped to provide continuous and full METOC services for tactical air operations from a Main Air Base or Air Facility during Sustained Operations Ashore (SOA). This support is inclusive of all six functions of Marine aviation.

2. MST. The MST is task organized and portably equipped to provide limited METOC support to operational commanders of the CE, CSSE, or GCE. Additionally, the MST can be assigned to accompany MEU commanders in order to satisfy operational requirements. Effectiveness and/or limitations of support is directly related to the MST's reliance on access and sustainment of C4I connectivity with higher METOC echelons or G/S-2 activities for the collection of essential METOC information/data. Prior planning and coordination in this area should minimize or reduce this shortfall to an acceptable level.

E. Equipment Capabilities. The METMF element employs equipment that provides a wide range of support capabilities. MSTs employ more mobile equipment with fewer capabilities.

1. METMF. This complex is equipped for receiving and transmitting METOC data required to analyze and predict weather conditions in areas of tactical aviation operations. The METMF can be task organized to meet operational requirements. A diagram of the METMF complex is shown in Appendix A. Support provisions consist of the following five Mobile Facility (MF) working areas:

a. Primary Van (Configuration Code WJ-01). This facility is configured to provide for the collection and dissemination of METOC data transmitted by satellite, radio and landline networks.

b. Secondary Van (Configuration Code WJ-02). The interior is configured to provide a facility for local and remote closed circuit television (CCTV) dissemination of METOC information, servicing and repairing of equipment, parts storage, and administration functions.

c. Weather Radar Van (Configuration Code WJ-04). This van is configured to provide a facility for radar detection, ranging and tracking of storms and other meteorological phenomena. It contains the meteorological radar set AN/FPS-106(V) 2. This radar has an operating range of 200 nautical miles (NM) and possesses the capability to interrogate meteorological phenomena up to a height of 60,000 feet. This asset is only assigned to MWSS sites that are designated as fixed wing (F/W) MWSSs.

d. AN/TMQ-35 MARK IV Satellite Van (Configuration Code WJ-05). This iso-shelter is configured as a weather satellite terminal facility, which can provide interactive, real time, high-resolution imagery and non-imagery data as a soft copy display and hard copy printout. It is capable of receiving encrypted imagery data originating from the Defense Meteorological Satellite Program (DMSP) in addition to non-encrypted imagery provided by National Oceanographic and Atmospheric Administration (NOAA) TIROS-N satellites.

e. Integrated Unit (Configuration Code SI-01). The interior of this iso-shelter is configured to provide a facility for physically and electrically interconnecting MFs into a METMF complex. It also provides a work area for administrative functions.

2. MST. The MST is authorized to remove and employ selected METOC equipment from the parent MWSS METMF in support of its assigned mission. During real world contingencies, removal of the AN/UYK-83 component of the Mobile Oceanography Support System (MOSS) could significantly impact the METMF's ability to provide environmental assessment to Electro-Optical sensor performance, as well as Electromagnetic Propagation products for friendly/threat systems to the ACE. Careful consideration should be given before its removal. The below listed equipment allows for a limited METOC support capability.

a. Interim Mobile Oceanography Support System (IMOSS). This system is a rapid response, on-scene environmental prediction system used to quickly determine the effects/impact of the environment on fleet sensors, platforms and weapons systems. It is comprised of three components that are networked together, but are capable of operating independently of each other. A brief description of each is provided.

(1) IMOSS MAIN. This is a NEC Versa 6030H laptop computer system with a Pentium 133 processor. It has 32 MB of random access memory, an upgraded color LCD display, two 1.3 GB removable hard drives (one for classified work and one for unclassified work) and a color ink-jet printer. This system is capable of ingesting and storing data/information from the SAT MOD and COMM MOD components of the MOSS and connecting to other local and wide area networks for distribution of value-added weather products.

(2) IMOSS Weather Satellite Module (SAT MOD). The SAT MOD is a laptop computer system that is designed to receive and store low resolution, non-encrypted imagery from NOAA TIROS-N and Former Soviet Union Meteor polar orbiting satellites. This imagery can be transferred to the IMOSS Main for display on its upgraded LCD display and for further enhancement or manipulation utilizing a special analysis program. Include is a 10 foot patio mount dish antenna. This enables the system to obtain weather products from various geo-stationary satellites.

(3) Communications Module (COMM MOD). The COMM MOD is a laptop computer system that is designed to receive and store alphanumeric and graphical METOC data via the high frequency (HF) receiver, or shipboard communications facilities. The computer is connected to a

Kenwood Model R-5000 all band, all mode general coverage HF receiver. Additionally, this data can be transferred and displayed on the IMOSS Main computer.

b. Alden 9315TR Radio Facsimile System. Allows for the HF radio reception of graphical METOC charts and alphanumeric products.

F. Organization. Marine Corps Forces are organized for combat by forming its forces into integrated combined arms units called Marine Air Ground Task Force (MAGTF). MAGTFs are specifically sized and tailored to accomplish an assigned mission. The MAGTF provides unique flexibility for an extraordinary range of options from forcible entry amphibious operations to limited objective operations. METOC support is provided from the Aviation Combat Element (ACE) of the MAGTF, specifically from the Marine Wing Support Squadron. The task organization and the assigned mission of the MAGTF will determine the exact composition of METOC personnel and equipment required to support combat operations. For the purpose of this discussion, Third Marine Aircraft Wing will be used to illustrate organizational concepts of METOC support to a Marine Expeditionary Force (MEF) size operation.

1. MWSS Organization within the MEF. The Commander, First Marine Expeditionary Force (I MEF) has operational control of all Third Marine Aircraft Wing (3D MAW) assets which includes Marine Wing Support Group (MWSG) 37 and its four subordinate MWSSs. Figure 1 illustrates this.

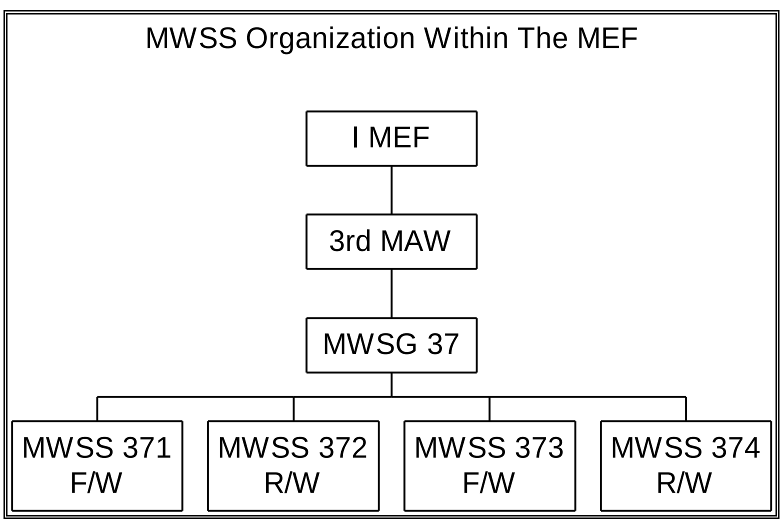


Figure 1

2. METOC Support to MAGTF Operations. Figure 2 illustrates METOC employment concepts and support to MAGTF Operations within a MEF. The ACE Component would be supported with up to four METMFs (2 F/W and 2 R/W) drawn from each MWSS within the MWSG. An MST would be designated from 3 MWSSs to accompany and support the remaining

elements. The last remaining MST could be optionally deployed as necessary.

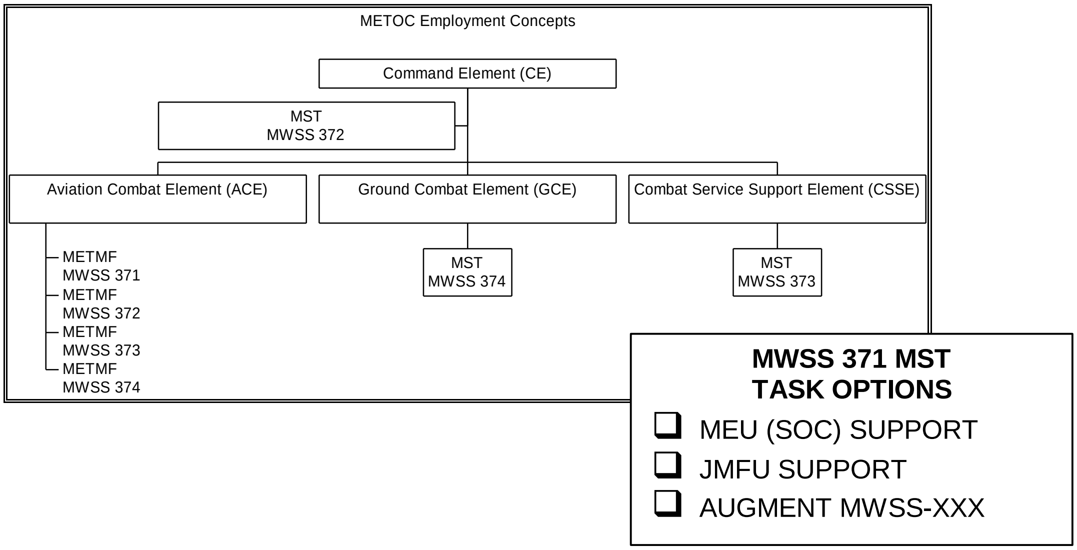


Figure 2

3. Personnel Organization. The Table of Organization (T/O) for METOC personnel within the METMF and MST comprises four METOC occupational field specialties or MOS. They are the Weather Officer (MOS 6802), Weather Forecaster (MOS 6842), Weather Observer (MOS 6821) and METMF Technician (MOS 6493). When not deployed, METOC personnel are normally assigned to augment and assist the Host Air Station command's Weather Service section under the Fleet Assistance Program (FAP) in order to maintain MOS proficiency. Figure 3 illustrates a typical METOC T/O and chain of command (COC) within a MWSS.

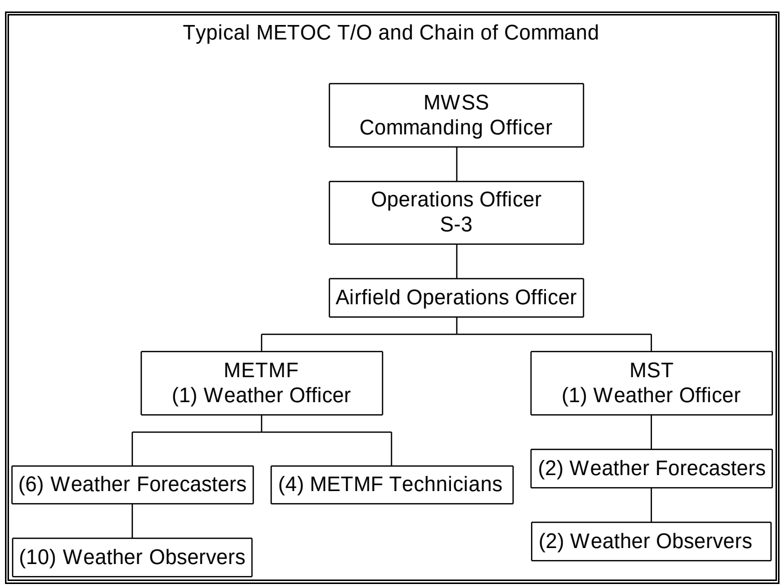


Figure 3

G. Tasks and Services. METOC elements are capable of providing a multitude of products and services in order to satisfy requirements of each MAGTF combat element. Additionally, these services can be tailored to satisfy needs at both the operational and tactical levels.

1. Ground Combat Element (GCE). Marine Corps warfighting doctrine stresses expeditionary (and particularly amphibious) operations and is heavily maneuver warfare oriented. As a result, the GCE requires weather and oceanographic support in the form of graphical products that can be used for briefing and decision aids. Additionally, these products can be integrated into the weather component of intelligence preparation of the battlefield (IPB) with a heavy emphasis on the ground scheme of maneuver. An MST could be tasked to accompany the GCE to provide METOC information and products that would fulfill its unique operational requirements.

2. Combat Service Support Element (CSSE). Although not as sensitive to weather as ground and air operations, the CSSE operations can be strongly influenced by extreme METOC conditions. Both extreme heat and cold can put additional stresses and strains on equipment. This can create increased requirements for maintenance and spare parts. Heavy precipitation can make outside storage difficult. Severe weather can degrade the existing road system and, in the case of heavy icing or snow build-up, make the road system impassable. Unfavorable sea state conditions can make landing support and logistics over the shore much more difficult. An MST could be tasked to accompany the CSSE to provide accurate and timely weather observations and severe weather warnings or advisories for METOC conditions that will significantly impact the CSSE's support efforts.

3. Aviation Combat Element (ACE). The ACE requires precise current METOC information and forecasts over a much wider area for operational planning and execution. Aviation units are concerned with METOC conditions at widely dispersed forward operating bases, weather conditions enroute to destinations and targets, as well as conditions at the arrival airfield or over the target areas. The METMF is tasked to provide for the continuous collection, processing, production, and dissemination of METOC data, forecasts and tactical decision aids for ACE operations. Additionally, it can be tasked as a theater level METOC forecast center that would be responsible for providing tailored products to MST elements in the theater of operations.

4. Command Element (CE). The CE requires a broad and intricate variety of METOC information that can encompass the entire spectrum of conflict and levels of combat operations. METOC information has a significant role in the IPB process within the CE. An MST can be tasked to accompany and assist the MAGTF commander and staff in planning effective ways/methods of exploiting the environmental impact on military forces on the battlefield.

5. Joint Task Force (JTF). Joint Doctrine continues to evolve that establishes policy and assigns responsibilities for providing METOC support to unified and specified commands, joint task forces (JTFs), and other joint activities. Within this doctrine, the Marine Corps will continue to be responsible for providing METOC support to MAGTFs. Additionally, Marine Corps METOC personnel and equipment can be assigned/tasked to augment a Joint METOC Forecast Unit (JMFU) to provide a collective, synergistic and dedicated support to service component command and control activities and to the JTF when required.

H. Limitations

1. General. Historically, the Marine Corps has provided a more comprehensive level of METOC support to the ACE than to other MAGTF elements. In April 94, the Marine Corps formally recognized a need to enhance its organic METOC capability for the purpose of improving its support to all MAGTF elements. It established the MST with interim equipment provisions to fill a previous void and to provide a METOC service that, up until then, was exclusive to the ACE. The MST represents quantum leap efforts towards the further development and evolvement of a "total force" METOC support concept. However, the METOC occupational field is undergoing significant changes and is in a transitional phase defined in terms of organizational restructure, material/equipment acquisition, education and training programs. This transitional phase may limit or impact the desired levels or types of support that can be provided to current Marine Corps operations.

   a. Doctrine. Until June of 1998, the METOC occupational field did not have an overarching concept and supporting doctrine for the provision of its support to the MAGTF. The impact of this shortfall was that commanders of the MAGTF elements were not able to effectively integrate and exploit the potential effects of METOC information into their operational planning and factor weather parameters and conditions into the IPB process. Recently, a Marine Corps Warfighting Publication (MCWP) has been fielded to the fleet. This will serve as an informational tool and guidance to the fleet for effectively employing METOC assets and personnel in support of MAGTF operations. Additionally, this handbook will serve as a baseline reference for future development into Marine Corps METOC support doctrine.

2. METMF

   a. Logistics/Lift Footprint. The METMF complex is capable of being transported by strategic airlift or sealift assets to the AOR. However, the current configuration of the METMF complex requires a general lift footprint of one C141 aircraft. An alternate deployment method is by an aviation logistics support ship (TAV-B) class. While this method is an option, it is not an optimal solution due to the time it takes to get to the theater of operation. The WJ-01 and WJ-05 should be considered and included whenever possible with the Fly-In Support Package (FISP) echelon of the MALSP during a contingency, in order to support the crucial early phases of MAGTF operations.

b. Employment. The METMF is normally employed and most effective in support of sustained operations from an Air Facility or Main Air Base. Currently, there is no expeditionary METOC capability to support the ACE during the crucial early stages of a MEF (FWD) or MEF size contingency. These are critical points to consider since it is most likely that during these early stages, the MAGTF will need to rely heavily on the ACE's ability to establish air superiority in order to reduce or neutralize the immediate enemy threat to its follow-on operations. The absence of a "first in" METOC contingent/team or expeditionary capability during this period could reduce the ACE's ability to exploit weather conditions which in turn could degrade or limit its effectiveness to support the MAGTF.

3. MST. On 1 April 94, a message from CMC to the MEF announced that the structure for both F/W and R/W MWSSs was increased to reflect an MST in order to provide METOC support to the MEF CE, GCE, CSSE and MEUs. As an interim solution, the MST was authorized to remove specific items of equipment from the METMF to provide support to the other MAGTF elements. The authorized increase in T/O left immediate billet vacancies that will be slow to fill. It is anticipated that it will take between 3 to 4 years to train personnel to fill all of these additional billets. Very limited METOC support is available to the MEF at this time. However, it is provided at the expense of dedicated ACE personnel and equipment.

a. C4I. The MST suffers similar shortfalls as the METMF complex in its inability to be fully integrated into the Marine Corps C4I network. It will rely heavily on the supported MAGTF element to provide and supplement communications connectivity to higher METOC echelons and/or access to G/S-2 assets/resources for the collection and dissemination of METOC information. This information must be received, analyzed and disseminated in a timely manner due to its highly perishable nature and potential tactical usefulness or value to operational commanders.

b. Logistics. The MST does not possess the logistical support capabilities as enjoyed by the METMF complex. Conceptually, the supported MAGTF element would share responsibility with the MST element in order to ensure that logistics requirements are satisfied.

I. METOC Products and Services. A variety of METOC products and services are routinely available to aid operational commanders and staff planners. Tailored products can be provided upon request to accommodate many tactical situations or missions. A brief discussion of some of the more common products and services will be presented here.

1. Solar/Lunar Almanac. Provides monthly or daily summaries of ephemeris data for the sun and moon locations worldwide. These summaries include times for sunrise/sunset, moonrise/moonset, beginning/ending times of nautical and civil twilight, total daylight and percent illuminance, phases of the moon in percent illumination, time and altitude of sun/moon meridional passage, night vision goggle (NVG) illumination data, and 24 hour solar/lunar positions (altitude and azimuth). This data can be produced in tabular or graphical format.

2. Radiological Fallout. The program used will forecast patterns of radiological fallout, which may be used to determine unit maneuvering in the event of a nuclear burst. The output diagram reflects variable levels of radiation at a user defined time period. The user may also set the levels of radiation.

3. Vapor Liquid Substance (VLS) Tracking Program. This program assists in forecasting patterns of chemical fallout, which may be used to determine unit maneuvering in the event of chemical warfare.

4. Weather Effects Matrix. Weather elements and their associated impact on operations are the primary focus of the weather matrix. It is part of the Intelligence Preparation of the Battlefield (IPB) process and will assist commanders and planners in making GO/No GO decisions. The impact of weather on specific mission areas will be defined as FAVORABLE, MARGINAL or UNFAVORABLE. This product can be tailored or adapted to meet specific operational criteria or mission parameters. An example of the Weather Effects Matrix is provided in Figures 4A and 4B.

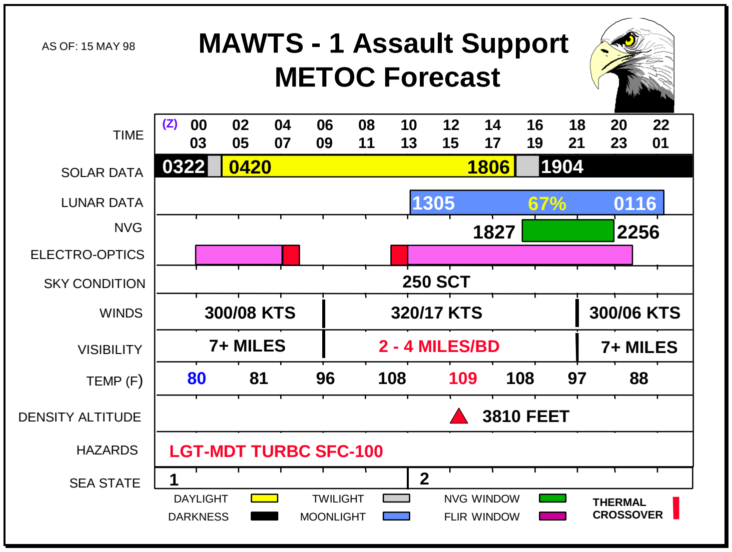


Figure 4A

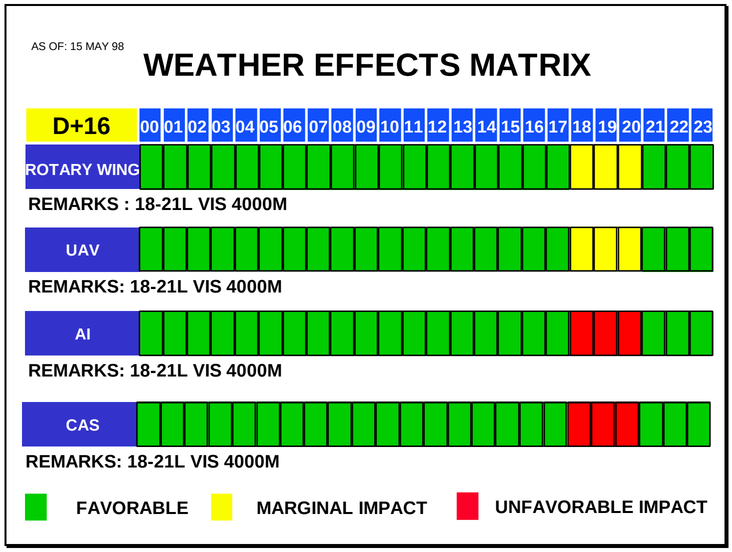


Figure 4B

5. MAGTF Standard Tactical METOC Support Plan. This plan provides for a common baseline of standardized products and services to be provided at a minimum during MAGTF operations. These tactical support products are tailored or modified as necessary by on-scene METOC forces to meet specific operational requirements and tactical situations. The METOC support plan consists of the following three areas:

a. OPTASK METOC (Meteorology/Oceanography). Operational tasks are developed using NATO APP-4 standards to provide a standard message for the coordination of tactical METOC services and reporting responsibilities within a MAGTF. A standard Marine Corps-wide OPTASK METOC has yet to be promulgated by the commanders, Marine Forces (MARFOR) Pacific/Atlantic. Once published, MAGTF commanders would issue serialized OPTASK METOC supplements detailing specific requirements for all operations and exercises.

b. Standard Tactical Summaries. These summaries are designed to provide minimum levels of tactical METOC support to MAGTF elements during routine operations. They include the MAGTF Weather Forecast (WEAX) and Tactical Atmospheric Summary (TAS). These support products are normally transmitted daily or as required.

(1) WEAX. Provides a plain language meteorological situation, 24-hour forecast, and outlook to 48 hours for each METOC or operational zone of interest. Astronomical data is included and a radiological forecast is appended as required. (See Appendix C)

(2) Tactical Atmospheric Summary (TAS). Provides an atmospheric refractive summary, tactical assessment, electromagnetic sensor

performance predictions, infrared sensor detection range predictions and communication range predictions. (See Appendix D)

c. Special Tactical Summaries. These summaries are designed to provide minimum levels of tactical METOC support for specific operations and/or functions of Marine aviation. They include the Amphibious Objective Area Forecast (AOAFCST), Strike Forecast (STRKFCST), and Assault Forecast (ASLTFCST).

(1) Amphibious Objective Area Forecast. The AOAFCST is designed to provide support for exercise/real-world amphibious landings and rehearsals. It includes a plain language meteorological situation, 24-hour forecast for the amphibious objective/landing area, surf forecasts for target beaches, tactical assessment, abbreviated atmospheric summary, and astronomical data. Radiological and chemical fallout forecast would be appended as the tactical situation dictates. (See Appendix E)

(2) Strike Forecast. The STRKFCST is designed to provide a coordinated forecast whenever multiple strike (OAAW/SEAD/DAS) platforms (VMA/VMFA/VMAQ) are operating as an integrated force under one tactical commander. It includes a plain language meteorological situation, 24-hour forecast of enroute and target weather, outlook to 48 hours, tactical assessment, and electro-optical sensor performance predictions. (See Appendix F)

(3) Assault Forecast. The ASLTFCST is designed to provide a coordinated forecast whenever multiple assault support platforms (VMGR/HMH/HMM/HMLA) are operating as an integrated force under one tactical commander. It includes a plain language meteorological situation, 24-hour forecast of enroute, FARP/RGR and landing zone weather, outlook to 48 hours, tactical assessment, and electro-optical sensor performance predictions. (See Appendix G)

6. Electro-Optical Tactical Decision Aids (EOTDA). The effects of weather on sensor performance of various weapon systems and platforms is complex and does not lend itself to easy treatment. Although new technology continues to offer advantages that increase performance of "smart" weapons, an unavoidable and intangible factor is the weather and its impact on them. EOTDA is a software model that predicts the performance of air-to-ground weapon systems and direct view optics based on environmental and tactical information. Performance is expressed primarily in terms of maximum detection or lock-on range. The EOTDA program supports three regions of the spectrum: infrared, visible and laser. Most Marine Corps aviation platforms, weapons and systems are supported by the database contained in

the program. Systems not supported can be defined by the user to work with the EOTDA program.

7. Integrated Refractive Effects Prediction System (IREPS). The IREPS software was developed to provide a rapid-response, on-scene environmental data processing, prediction, and display capability for the comprehensive assessment of refractive effects upon surveillance, communication, electronic warfare, and weapon guidance systems. Locally collected meteorological information is used to prepare analyses of present atmospheric and electromagnetic (EM) propagation conditions. A brief description of common applications/products of this system used within ACE operations will be discussed.

   a. Cover. This product has many tactical uses. The most important task of air defense is to develop a "total" air picture through surface based and airborne surveillance platforms. The IREPS coverage diagram (COVER) provides a display of radar detection or communication in the vertical plane. The output diagram will alert units to potential "shadow zones" in their radar coverage against attacking aircraft or missiles. When used for threat SAMs, the cover diagram will show the threat radar's area of coverage on a curved earth, and plots range versus height. Cover incorporates the effects of the atmosphere on a threat system and therefore compliments TAMPS data. Another tactical use of COVER is for attack aircraft positioning. Knowledge of the existence and the height of a surface based duct would enable the mission planner to select the optimum altitude for penetration. By flying within a duct, the aircraft will enhance its standoff range. In a similar situation, an ECM aircraft can adjust its position to maximize the effectiveness of on-board jammers by using the coverage display. Figure 5 shows an example of the Cover diagram and how it can be used to assist the warfighter.

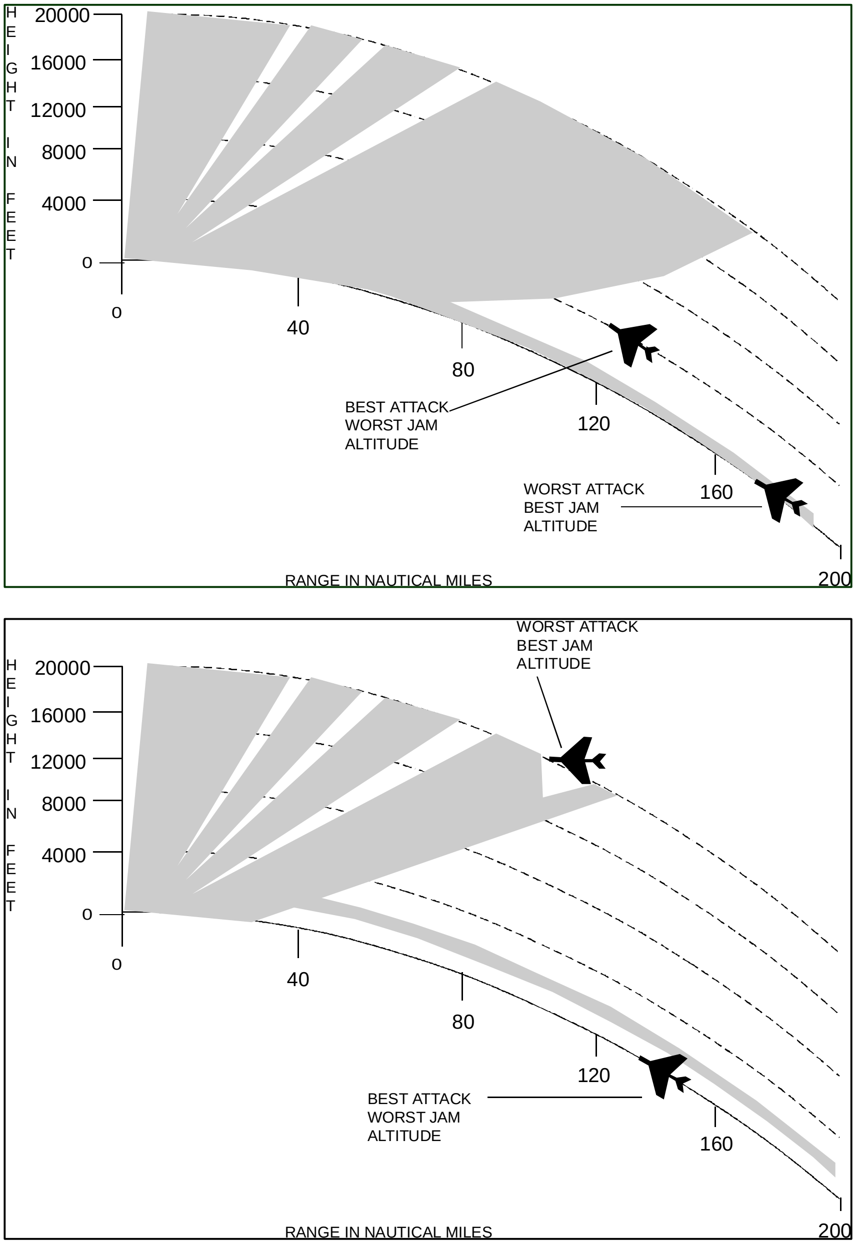


Figure 5

b. Path-Loss. This IREPS product shows one way path loss in dB's versus range due to spreading, diffraction, scattering, and anomalous propagation. It can be used for long range air-search radar's (surface-based or airborne), surface search radar's when employed against low flying targets, and to determine intercept range of radar or communications systems by an ESM receiver. In fact, once an altitude is specified for the path-loss curve, it is simply a slice the COVER display at the specified altitude. An example of a Path-Loss diagram is swon in Figure 6.

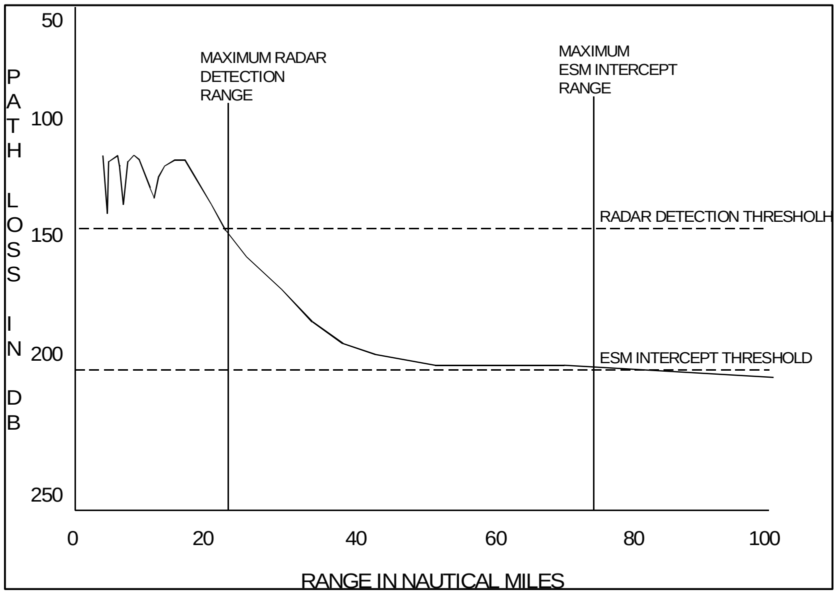


Figure 6

c. Platform Vulnerability (PV). PV is useful in evaluating EMCON posture. This IREPS product assesses the relative vulnerability of various emitters within the Marine Air Control Group (MACG) versus their value in surveillance or communication. A bar graph shows the maximum range that a specified receiver can detect these emitters under given atmospheric conditions. From this display, it is immediately obvious which emitter within the MACG is most vulnerable to intercept. By selectively silencing various emitters, the C3 mission planner can customize an EMCON plan to a particular mission. PV is normally employed against aircraft flying at altitudes higher than 10,000 feet. An example of a Platform Vulnerability chart is included as Figure 7.

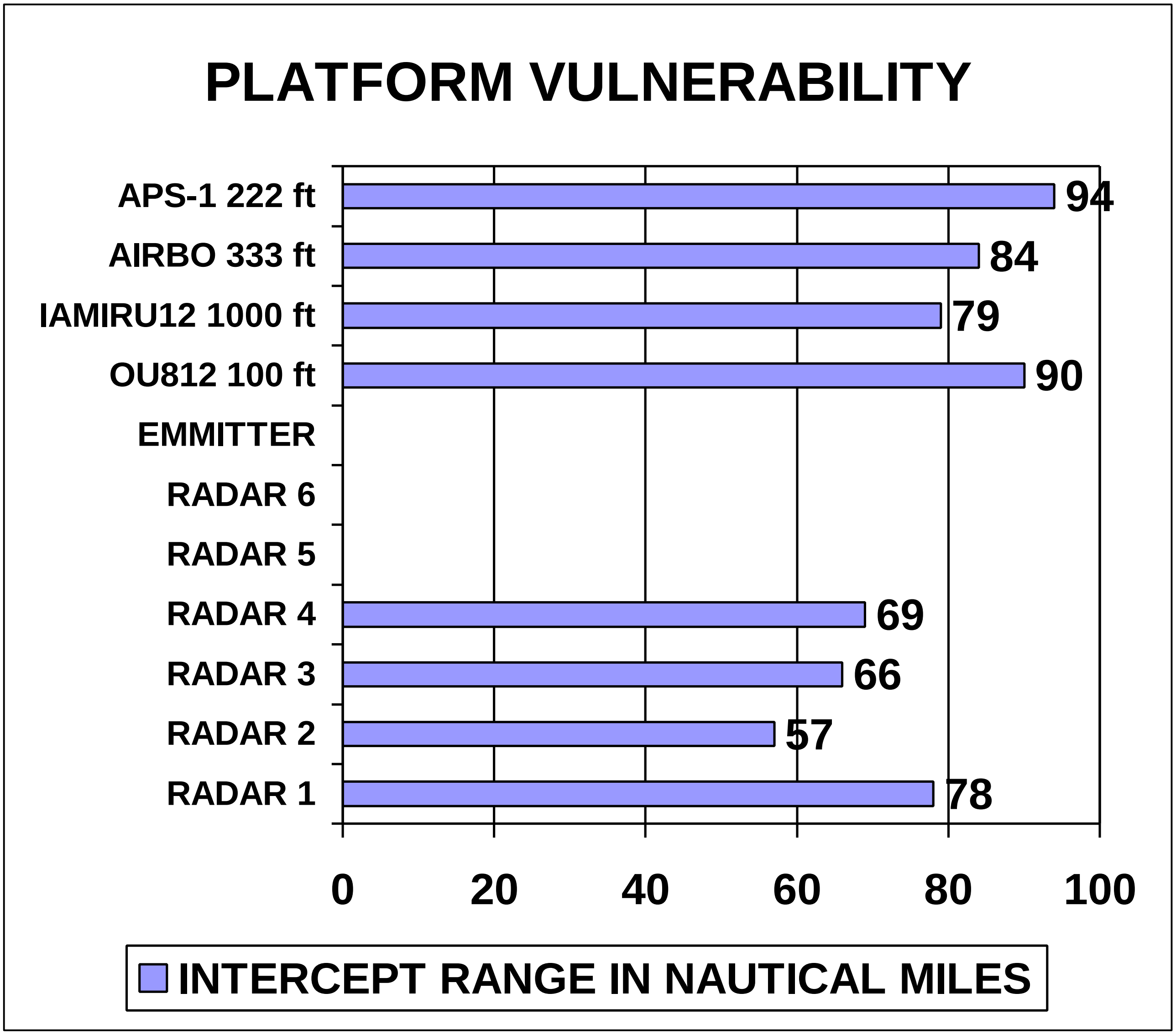


Figure 7

8. <u>METOC Briefings</u>. Stand-up METOC briefings can be conducted to support operational or tactical objectives. A variety of mediums can be used in preparing these briefs ranging from overhead transparencies to computer/electronic presentations. Prior planning and coordination with G/S-2 and G/S-3 is recommended to ensure consistency, continuity and appropriateness of the type of brief to be conducted. Two common types of METOC briefings will be discussed here.

   a. <u>Climatological Briefs</u>. These briefs can be conducted for any geographical area or location of interest for any time of year. They are normally conducted as part of pre-deployment work-ups to normal operations, exercises, or actual contingencies. A 24 to 48-hour advance notice is recommended in order to research material/references, collect, process, and prepare data for this type of brief. Historical and statistical METOC data/information are used exclusively and should not be misconstrued with actual or real-time METOC events. Elements that are normally covered but not limited to include General Geography and Terrain, Oceanography, General Climate, Historical Electromagnetic Propagation, Electro-Optical Climatology (IR Band only), Astronomical Information, Specific Weather Elements, and Assessment/Impact to Planned Operations. Appendix H is provided as an example of this type of brief.

b. Operational Briefs. This type of brief is normally conducted twice daily (morning/evening) or as necessary to support actual combat operations and exercises. METOC support objectives are established for this type of brief based on the combat element being supported, level of command, and the mission to be accomplished. This brief will normally cover but not be limited to an analysis of the current METOC situation, forecast conditions out to 96 hours, astronomical data, and impact assessment to planned Courses of Action (COA)/operations. Appendix I provides an example of a typical brief that may be provided to the ACE Commander and staff planners during a MEF size operation.

J. The Future. The future holds tremendous promise for the full exploitation and integration of METOC information into MAGTF operations. The latest technologies will be incorporated into systems and equipment soon to fielded. These new systems will increase our METOC capabilities and they will be completely interoperable, and more responsive to, MAGTF requirements. Marine Corps METOC doctrine is currently under development that will further enhance mission readiness, standardize training and education, and define an overarching concept of operation and employment capabilities.

1. METMF Replacement Program. The METMF (R) will replace the current operational configuration of the METMF complex. It will be a transportable system which will provide tactical METOC support to the MAGTF in garrison and while engaged in expeditionary warfare. Housed in a single shelter, it will be capable of being transported by one C-130 aircraft for rapid deployment operations. The METMF (R) will provide the MAGTF with continuous meteorological observations, satellite imagery, forecasts and other tactical decision aids and products for 30 days without re-supply. Additionally, it will be fully interoperable with Marine Corps C4I systems and METOC systems of the other services and government agencies. The first METMF (R) was fielded in FY 97 and is currently undergoing operational evaluation testing at Bouge Field, NC. (See Appendix B)

a. Operational and Support Concepts. The METMF (R) will operate in support of Marine Corps Aviation units as the METOC component of ten active and two reserve MWSSs deployed worldwide. Data will be automatically acquired and fused from local surface and upper-air sensors, meteorological satellites, terrestrial and telecommunications sources providing METOC data. This data will be electronically processed and overlaid with meteorological imagery and gridded field data to produce forecasts and METOC briefings. Portable systems will be included to allow remote support of Marine Forces with MSTs.

2. Total ACE Support Concept. A comprehensive study of the Marine Corps METOC occupational field was completed in April 1994 by MCCDC (C453). It highlighted a requirement for a small, lightweight METOC capability to accompany MAGTF forces ashore prior to the arrival of the METMF and during situations where air and sealift limitations precluded the deployment of the METMF. It further identified a requirement for a METOC capability of limited size to provide support at forward operating bases. The study recommended three courses of action to be undertaken in order to fulfill the ACEs operational needs for METOC support during all three types of Marine Corps operations: Operational Maneuver From the Sea (OMFTS), Operations Other Than War (OOTW), Sustained Operations Ashore (SOA). These recommendations are outlined below.

   a. **Field the METMF (R)**. The Marine Corps should ensure that the METMF (R) acquisition action is funded and otherwise on-track. One METMF (R) should be assigned to each MWSS in the active and reserve forces.

   b. **Develop a METOC support capability for forward operating bases.** The Marine Corps should develop a downsized, high-mobility, multipurpose wheeled vehicle capability to provide limited METOC support to forward operating bases (FOB) for aviation units. One FOB system should be assigned to each MWSS.

   c. **Develop an assault METOC capability.** There is a requirement for an assault METOC capability that would permit some equipment to be dismounted from the METMF (R) and deployed ashore with a two or three man team early in an operation to provide a minimum METOC capability.

3. These recommendations led to the development of a new integrated concept for providing a more comprehensive level of support to the ACE. It has undergone extensive testing during the past four years that includes eight WTI Course exercises and several independently conducted training deployments. This concept is not officially promulgated or supported by HQMC. It will be discussed briefly here for informational purposes.

   a. The Concept. The METMF section is internally organized and structured into three separate elements or "packages" of METOC support. Each is manned and equipped to provide various levels of METOC support. The size, scope and mission of the ACE will determine which element or their combinations are required. Each element is capable of deploying separately or can be phased into the area of operation.

(1) Option One. This option is designed to provide an immediate "first-in" capability and minimum level of METOC support to ACE (Forward) or Special Purpose MAGTF Aviation Elements. It can be easily deployed as a "fly-away" team for quick insertion into a crisis location and can serve as the lead echelon for the METMF. It consists of a two or three member team with man portable equipment. The mission and implied tasking of the ACE will determine the exact composition of the team. The METOC support team is capable of providing on-scene data collection and can serve as a survey team for follow-on METOC echelons.

(2) Option Two. This option provides for a METOC team that is task organized to provide a greater level of METOC support than Option One. It is manned and equipped to support a variety of ACE operations. At a minimum, it will consist of two weather forecasters and two weather observers in order to provide continuous 24-hour METOC support. This includes meteorological observations, limited forecasting, and tactical decision aid support. The personnel and equipment are highly mobile and may be transported in vehicles as small as a HMMWV. This element may be employed independently or can precede the deployment of the METMF. This option is the most flexible of the three aviation METOC support elements and offers a credible capability for most ACE operations.

(3) METMF. The highest level of METOC support is the deployment of the METMF. The METMF provides a METOC support capability similar to that found in garrison weather facilities and is normally deployed as part of an entire MWSS. Once established ashore, the METMF may re-deploy its previously deployed assets in support of aviation units, which are not located in close proximity to it (such as the TACC, DASC, or FOBs). This redeployment also provides the METMF with a forward data collection capability that significantly enhances support efforts to the entire MAGTF.

III. Summary

A. Commanders have always looked for an edge on the battlefield. Throughout history, there are many examples where weather has played a decisive and key factor in the outcome of a battle or campaign. From D-Day in World War II to Operation JUST CAUSE to the End Run in the Gulf War, accurate and timely METOC support can aid decision makers to pick the right platform, choose the right weapon, enter the right settings, pick the right area, use the right tactics and select the right time in order to maximize combat effectiveness. This discussion has focused on the mission, organization, employment, capabilities and limitations of the METMF and MST. It has also provide a snapshot of the future goals and capabilities of Marine METOC elements within the MWSSs to support the MAGTF on tomorrow's battlefield. Marine METOC is a tremendous force multiplier when integrated with the IPB and tactical decision processes. It can also spell disaster to military operations if commanders and planners lightly consider METOC's impact.

Quote to Ponder:

"Know yourself, know your enemy; your victory will never be endangered. Know the ground, know the weather; your victory will then be total........."

Sun Tzu
(Chinese General, 500 B.C.)

IV. Final Note

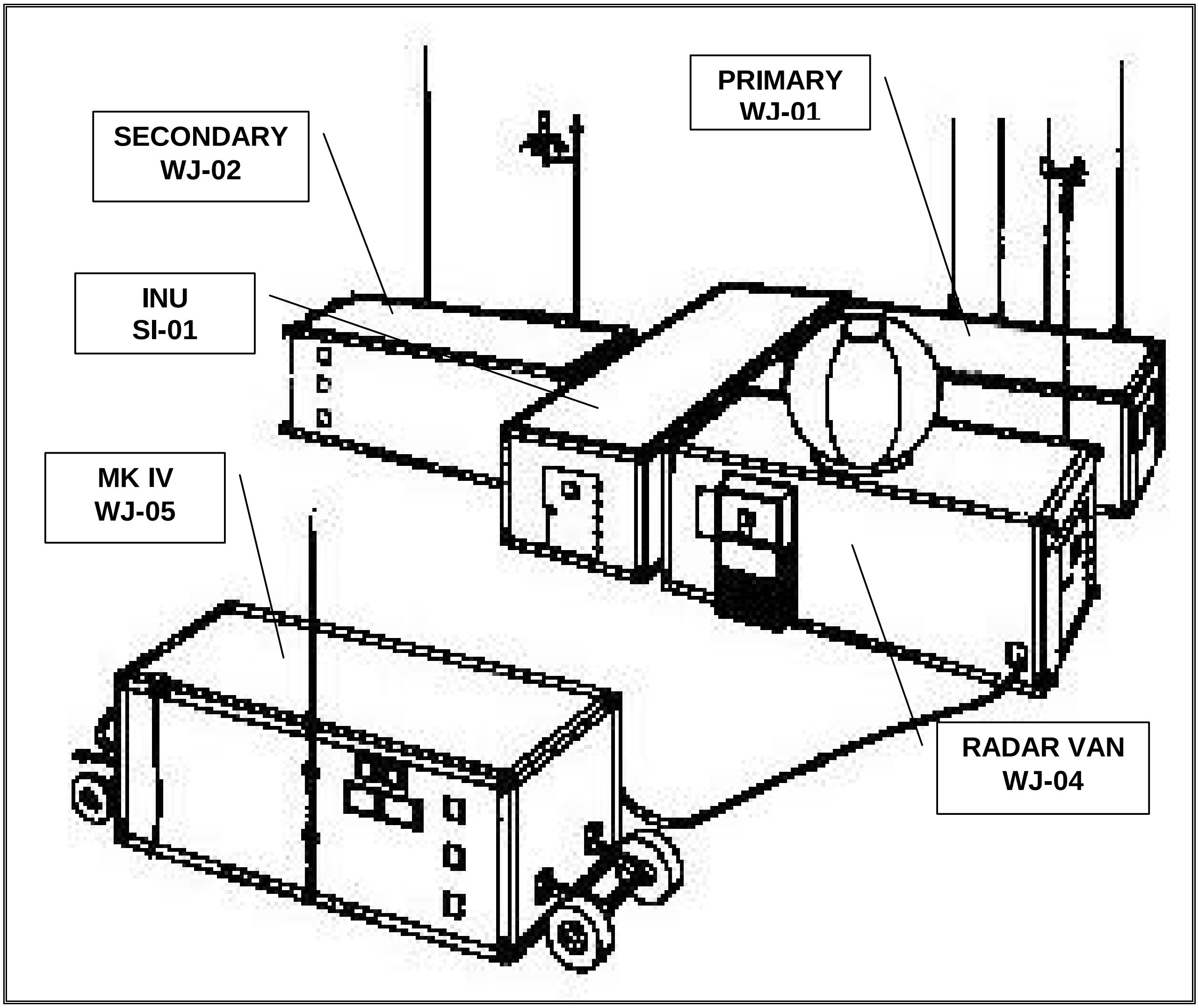
A Point of Contact (POC) list of all FMF METOC Officers is provided as Appendix J to this handout. For more information on any topics discussed during this presentation or on how Marine Weather can better support your unit and its mission, contact the nearest MWSS METOC Officer in your area.

Reviewed and Approved

______________________________ (Instructor)

______________________________ (Coordinator)

METMF Complex



Current METMF Complex

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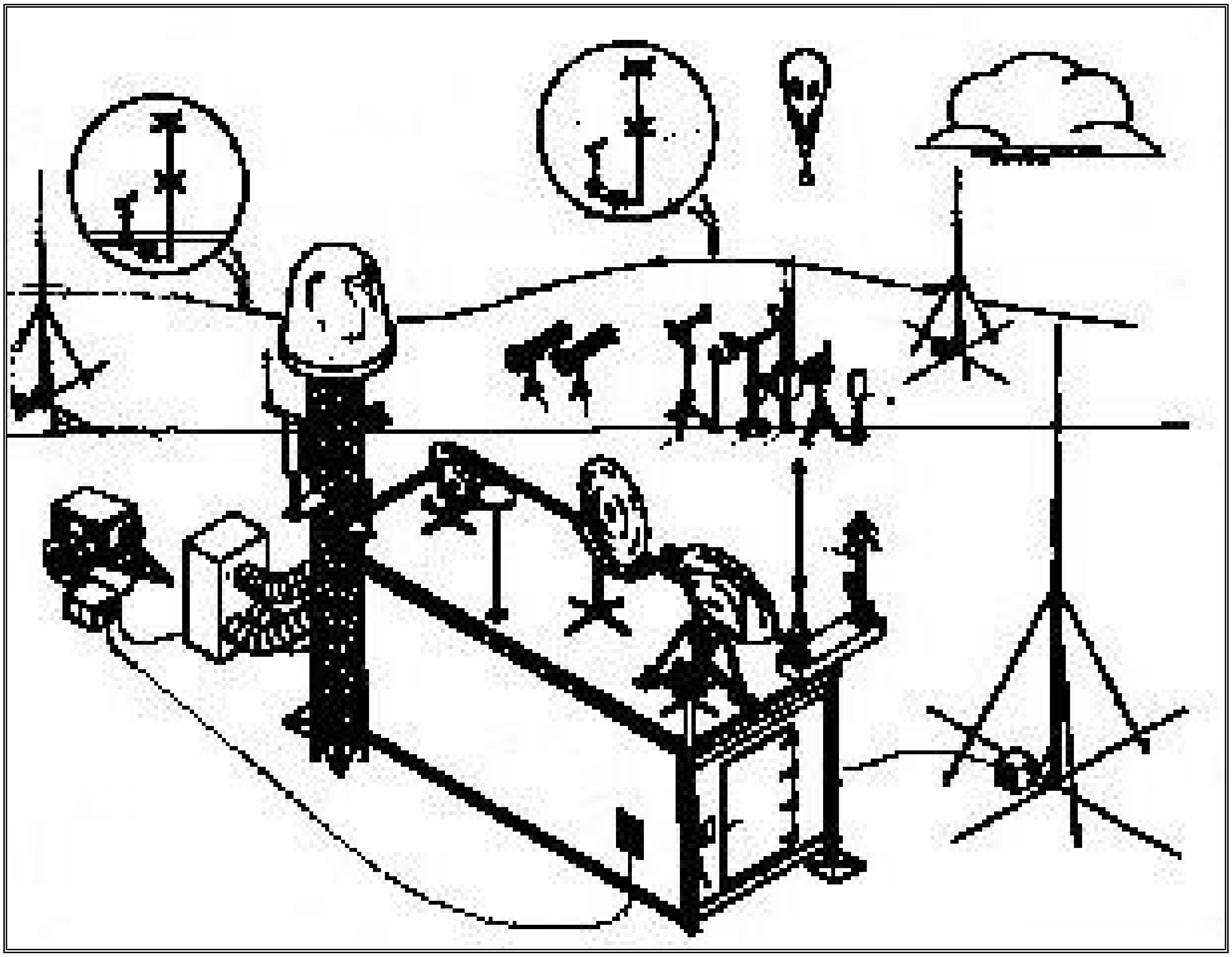
METMF(R)



METMF Replacement

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SAMPLE WEATHER FORECAST (WEAX)

8TH MEF(FWD) WEATHER FORECAST (WEAX) (U)

[PASS TO (CE/ACE/GCE/CSSE)]
MSGID/GENADMIN/UNIT/SERIAL/MON/YR//
SUBJ/8TH MEF(FWD) WEAX//
RMKS/1. ( ) METEOROLOGICAL SITUATION AT ______Z. (Note: Include the location/movement/development of synoptic high and low pressure centers and associated fronts referenced to common geographical points, area, or established METOC zones. When in doubt, use lat/long.)
2. ( ) 24-HOUR FORECAST COMMENCING ______Z [ALONG TRACK FROM ______N(S)/______E(W) TO ______N(S)/______E(W)] OR VCNTY OF ______N(S)/______E(W). (Note: AO should be omitted if COMMARFOR prefers an UNCLAS forecast.
A. SKY/WEATHER: (Note: Plain language format.)
B. VSBY (NM):
C. SURFACE WINDS (KTS):
D. MAX/MIN TEMPS (°F):
E. RELATIVE HUMIDITY (%):
F. ABSOLUTE HUMIDITY (g/m^3):
G. WBGT HEAT INDEX/FLAG CONDITION:
H. AVIATION PARAMETERS:
(1) CLOUD/CEILINGS (FT): (Note: TAF format recommended.)
(2) WINDS/TEMPS ALOFT (FL/DIR/SPD IN KTS/TEMPS IN °C):
(3) TURBULENCE: (Note: Include discussion of all known CAT.)
(4) MINIMUM FREEZING LEVEL (FT):
(5) ICING:
(6) CONTRAILS (FT):
(7) MINIMUM ALTIMETER SETTING (INS):
(8) MAXIMUM PA/DA:
3. ( ) OUTLOOK TO 48 HOURS:
4. ( ) ASTRONOMICAL DATA (UTC OR LOCAL):
A. SUNRISE/SUNSET/SUNRISE:
B. BMNT/BMCT/EECT/EENT/BMNT/BMCT:
C. MOONRISE/MOONSET/ILLUMINATION (PCT):
5. ( ) 24-HOUR RADFO FCST FOR (AIR BURST/SFC BURST):

	WEAPON YIELD (KILOTONS)		
A. EFF DOWNWIND DIR(T)/SPD(KTS):	___/__	___/__	___/
B. SECTOR ANGLE/DIST TO ZONE 1 (NM):	___/__	___/__	___/

(Note: RADFO fcst should be included for actual/exercise DEFCON 3 or MOPP Level 2. Otherwise at senior forecaster's discretion.)
6. ( ) RELEASED BY: (Note: Include when MINIMIZE imposed.)//
DECL/ // (As required.)

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SAMPLE TACTICAL ATMOSPHERIC SUMMARY (TAS)

TACTICAL ATMOSPHERIC SUMMARY (TAS) (U)

(PASS TO [MAG/TACC/DASC/MATC/TAOC/SAAWC])
MSGID/GENADMIN/UNIT/SERIAL/MON/YR//
SUBJ/TACTICAL ATMOSPHERIC SUMMARY (TAS)//
RMKS/1. ( ) ATMOSPHERIC REFRACTIVE SUMMARY: BASED ON ______Z UPPER-AIR SOUNDING TAKEN AT ______N/ ______W.
A. SURFACE-BASED DUCT HEIGHT (FT):
B. ELEVATED DUCTS (BOTTOM-TOP) (FT):
2. ( ) TACTICAL ASSESSMENT: (Note: 1. Expand on the guidance contained in the Propagation Conditions Summary (PCS) Module. Specifically, discuss the atmospheric impact on MAGTF EM systems with respect to sensor-target-duct geometry (i.e. aircraft positioning, optimum altitudes for jamming, attack, EM surveillance, etc.). Highlight those sensors which are significantly degraded/enhanced. Focus on tactical guidance which will enable the TAC, SAAWC, and combat mission planners to effectively exploit a given atmospheric environment. 2. As feasible, include an analysis/forecast of atmospheric refractivity conditions in the projected operating area.)
3. ( ) EM SENSOR PERFORMANCE PREDICTIONS:
A. AIR SEARCH RADAR RANGES (NM) FOR ___(MISSILE)/ ___(FIGHTER - BOMBER) SQ METER TARGETS AT VARIOUS ALTITUDES, BASED ON 90 PCT POD:
ALT (100S FT) (005) (010) (050) (100) (200) (300)
RADAR
AN/TPS-59 ___/________/________/________/________/________/
AN/TPS-63 ___/___ ___/________/___ ___/________/________/
AN/TPS-73 ___/________/________/________/________/________/
AN/MPQ-50 ___/________/________/________/________/________/
AN/MPQ-62 ___/________/________/________/________/________/
AN/UPS-3 ___/________/________/________/________/________/
AN/MPQ-53 ___/________/________/________/________/________/
AN/APS-138 ___/________/________/________/________/________/
AN/APY-1/2 ___/________/________/________/___ ___/________/
(Note: Radar x-sections should be tailored to the expected threat. NOCD TD 1195/MCM3-1, Vol. II provide representative values of typical U.S./Threat platforms. Include all air-search radars organic to or in support of the MAGTF.
B. ESM INTERCEPT RANGES (NM) FOR VARIOUS EMITTERS:
EMITTER ESM RECEIVER (AN/ALQ-99 - ______FT)
________ (Surface) ________
____________(Airborne)
____________(Missile)
(Note: A representative set of emitters tailored to the expected threat is preferable to listing every emitter available.)
C. ESM COUNTER DETECTION RANGES (NM) FOR VARIOUS THREAT ESM RECEIVERS:
U.S. EMITTER ESM RECEIVER
(Surface) (Airborne)

__________ _________

SAMPLE TACTICAL ATMOSPHERIC SUMMARY (TAS) (Continued)

Note: A representative list of U.S. emitters and threat ESM receivers is recommended.)

4. ( ) FLIR DETECTION RANGE PREDICTIONS WFOV/NFOV (NM) FOR ________ TGT AT VARIOUS ALTITUDES, BASED ON 50 PCT POD, VSBY ______ NM, WIND SPEED KTS,

ABSOLUTE HUMIDITY ______g/m^3:

ALT (100S FT) SENSOR	(005)	(010)	(050)	(100)	(200)	(300)
AN/AAR-51	___/ NA	___/ NA	___/ NA	NA/ NA	NA/ NA	NA/ NA
AN/AAS-38A	___/___	___/___	___/___	___/___	___/___	___/___
AN/AWS-1	___/___	___/___	NA/ NA	NA/ NA	NA/ NA	NA/ NA

(Note: Include FLIR sensors available within the MAGTF. Target types should be tailored to expected threat. Flight levels should be consistent with platforms supported.)

5. ( ) COMMUNICATION RANGE PREDICTIONS:

A. UHF COMMUNICATION RANGE: (NORMAL/EXTENDED/GREATLY EXTENDED)

B. HF RADIO PROPAGATION CONDITION/FORECAST:

(1) HF PROPAGATION CONDITION/FORECAST:

(2) 10.7 CM FLUX:

6. ( ) M-UNIT SUMMARY (PROVIDED FOR INPUT INTO IREPS):

HGT (FT) M-UNIT TYPE (SUB/NORM/SUPER/TRAP)

____

____

____

____

(Note: Include enough significant levels to enable MSTs to generate representative coverage diagrams using IREPS.)

7. ( ) MRS CALIBRATION DATA: (Note: Include this section only if MRS-capable units are operating in close proximity.)

8. ( ) RELEASED BY: (Note: Include when MINIMIZE imposed.)

//DECL/ //

AMPHIBIOUS OBJECTIVE AREA FORECAST (AOAFCST)

AMPHIBIOUS OBJECTIVE AREA FORECAST (AOAFCST) (U)

(PASS TO [CATF/CLF/MST/ACE])
MSGID/GENADMIN/UNIT/SERIAL/MON/YR//
SUBJ/AMPHIBIOUS OBJECTIVE AREA FORECAST (AOAFCST)//
RMKS/1. ( ) METEOROLOGICAL SITUATION AT ______Z.
2. ( ) 24-HOUR FORECAST COMMENCING ______Z FOR AMPHIBIOUS OBJECTIVE AREA. (Note: Include separate forecast for landing area if significantly different from AOA weather.)
A. SKY/WEATHER:
B. VSBY (NM):
C. SURFACE WINDS (KTS):
D. MAX/MIN TEMPS (°F): (Note include wind chill factor if applicable.)
E. SST (°F):
F. COMBINED SEAS (FT):
G. IN WATER SURVIVAL TIME (HRS):
H. AVIATION PARAMETERS:
(1) CLOUDS/CEILINGS (FT):
(2) WINDS/TEMPS ALOFT (FL/DIR/SPD IN KTS/TEMPS IN °C):
(3) TURBULENCE:
(4) FREEZING LEVEL (FT):
(5) ICING:
(6) MINIMUM ALTIMETER SETTING (INS):
(7) MAXIMUM PA/DA:
(8) CONTRAIL FORMATION:
(9) SLANT RANGE VISIBILITY (NM):
3. ( ) SURF FORECAST FOR (RED)/(BLUE) BEACH: (Note: Output format included in MOSS surf module.)
A. ALPHA - SIGNIFICANT BREAKER HEIGHT (FT):
B. BRAVO - MAXIMUM BREAKER HEIGHT (FT):
C. CHARLIE - DOMINANT BREAKER PERIOD (S):
D. DELTA - DOMINANT BREAKER TYPE: (i.e. ______% Spilling, Plunging, Surging)
E. ECHO - BREAKER ANGLE (DEG):
F. FOXTROT - LITTORAL CURRENT (KTS):
G. GOLF1 - NUMBER OF SURF LINES:
   GOLF2 - SURF ZONE WIDTH (FT):
H. MODIFIED SURF INDEX:
I. HIGH/LOW TIDES (UTC OR LOCAL):
J. BEACH CONDITIONS: (Note: Provide summary of hydrographic reconnaissance data to include bottom type, beach slope/type/trafficability, significant obstacles (locations) ashore and in shallows.)
4. ( ) TACTICAL ASSESSMENT: (Note: See CNSP/CNSLINST 3840.1 - Joint Surf Manual for a discussion of modified surf limits for various landing craft types. Discuss no-go criteria, LCAC limitations, etc.)
5. ( ) ATMOSPHERIC REFRACTIVE SUMMARY:
A. EVAPORATIVE DUCT HEIGHT (FT):
B. SURFACE-BASED DUCT HEIGHT (FT):
C. ELEVATED DUCT HEIGHTS (BOTTOM-TOP) (FT):

AMPHIBIOUS OBJECTIVE AREA FORECAST (AOAFCST) (Continued)

```
D. RADAR PROPAGATION CONDITIONS SUMMARY:
(1) SFC TO SFC RADAR RANGES: (Note: Expand upon the guidance contained
in EM
(2) SFC TO AIR RADAR RANGES:  PCS module.)
(3) AIR TO AIR RADAR RANGES:
(4) AIR TO SFC RADAR RANGES:
E. COMMUNICATION RANGE PREDICTIONS:
(1) UHF COMMUNICATION RANGE: (NORMAL/EXTENDED/GREATLY EXTENDED)
(2) HF RADIO PROPAGATION SUMMARY:
6. ( ) ASTRONOMICAL DATA (UTC OR LOCAL):
A. SUNRISE/SUNSET:
B. BMNT/BMCT/EECT/EENT:
C. MOONRISE/MOONSET/PCT ILLUMINATION:
D. NIGHT VISION EFFECTIVENESS (LUMENS):
7. ( ) 24-HOUR RADFO/CHEMFO FCST: (Note: Include as tactical situation
dictates.)
A. EFF DOWNWIND DIR(T)/SPD (KTS):
B. DISTANCE (NM):
8. ( ) RELEASED BY: (Note: Include when MINIMIZE imposed.)//
DECL/         //
```

SAMPLE STRIKE FORECAST (STRKFCST)

STRIKE FORECAST (STRKFCST) (U)

(PASS TO [MAG/TACC/DASC/FSCC/MATC/TAOC/SAAWC])
MSGID/GENADMIN/UNIT/SERIAL/MON/YR//
SUBJ/STRIKE FORECAST (STRKFCST)//
RMKS/1. ( ) METEOROLOGICAL SITUATION AT ______Z.
2. ( ) 24-HOUR FORECAST COMMENCING ______Z.
A. ENROUTE WX: ____________ TO ____________ TO ____________.
(1) SKY/WEATHER:
(2) VSBY/SLANT RANGE VSBY (NM):
(3) SST (°F)/IN WATER SURVIVAL TIME:
(4) CLOUD TOPS/CEILINGS (FT):
(5) ENROUTE WINDS/TEMPS ALOFT (LOCATION/FL/DIR/SPD IN KTS/TEMPS IN °C):
(6) TURBULENCE:
(7) MINIMUM FREEZING LEVEL (FT):
(8) ICING:
(9) MINIMUM ALTIMETER SETTING (INS):
(10) CONTRAIL FORMATION:
(11) DITCH HEADINGS (DEG T):
B. TARGET AREA WX: (Note: Repeat for each target area.)
(1) SKY/WEATHER:
(2) VSBY/SLANT RANGE VSBY (NM):
(3) SURFACE WINDS (KTS):
(4) MAX/MIN TEMPS (°F):
(5) CLOUD TOPS/CEILINGS (FT):
(6) WINDS/TEMPS ALOFT (FL/DIR/SPD IN KTS/TEMPS IN °C):
(7) TURBULENCE:
(8) FREEZING LEVEL (FT):
(9) ICING:
(10) MINIMUM ALTIMETER SETTING (INS):
(11) D-VALUES:
(12) CONTRAIL FORMATION:
(13) ASTRONOMICAL DATA (UTC) AT ______Z:
SUNRISE/SUNSET/SUN ANGLES (ELE/AZ):
BMNT/BMCT/EECT/EENT:
MOONRISE/MOONSET/PCT ILLUMINATION/MOON ANGLES (ELE/AZ)/LUX VALUES:
3. ( ) OUTLOOK TO 48 HRS:
4. ( ) TACTICAL ASSESSMENT: (Note: Correlate the current/forecast weather to major concerns such as aerial refueling track cloud layers and ceilings, severe wx, TGT ceilings and visibilities, bomb damage assessment (BDA), impact on EO systems/weapons, IFR conditions, etc.)
5. ( ) ELECTRO-OPTICAL SENSOR PERFORMANCE PREDICTIONS: (Note: Include representative EO sensor performance predictions for strike sensors/weapon systems and key environmental assumptions.)
6. ( ) RELEASED BY: (Note: Include when MINIMIZE imposed.)//
DECL/ //

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SAMPLE ASSAULT FORECAST (ASLTFCST)

ASSAULT FORECAST (ASLTFCST) (U)

(PASS TO [MAG/TACC/DASC/FSCC/MATC/TAOC/SAAWC])
MSGID/GENADMIN/UNIT/SERIAL/MON/YR//
SUBJ/ASSAULT FORECAST (ASLTFCST)//
RMKS/1. ( ) METEOROLOGICAL SITUATION AT ______Z.
2. ( ) 24-HOUR FORECAST COMMENCING ______Z.
A. ENROUTE WX: ____________ TO ____________ TO ____________.
(1) SKY/WEATHER:
(2) VSBY/SLANT RANGE VSBY (NM):
(3) SST (°F)/IN WATER SURVIVAL TIME:
(4) CLOUD TOPS/CEILINGS (FT):
(5) ENROUTE WINDS/TEMPS ALOFT (LOCATION/FL/DIR/SPD IN KTS/TEMPS IN °C):
(6) TURBULENCE:
(7) MINIMUM FREEZING LEVEL (FT):
(8) ICING:
(9) MINIMUM ALTIMETER SETTING (INS):
(10) CONTRAIL FORMATION:
(11) DITCH HEADINGS (DEG T):
B. FARP/RGR WX: (As required, include for return leg if necessary.)
(1) SKY/WEATHER:
(2) VSBY/SLANT RANGE VSBY (NM):
(3) SURFACE WINDS (KTS):
(4) CLOUD TOPS/CEILINGS (FT):
(5) MAX/MIN TEMPS (°F):
(6) MINIMUM ALTIMETER SETTING (INS):
(7) MAXIMUM PA/DA:
C. ASSAULT LZ WX: (Note: Repeat for each assault LZ.)
(1) SKY/WEATHER:
(2) VSBY/SLANT RANGE VSBY (NM):
(3) SURFACE WINDS (KTS):
(4) MAX/MIN TEMPS (°F):
(5) MAXIMUM PA/DA:
(6) CLOUD TOPS/CEILINGS (FT):
(7) WINDS/TEMPS ALOFT (FL/DIR/SPD IN KTS/TEMPS IN °C):
(8) TURBULENCE:
(9) FREEZING LEVEL (FT):
(10) ICING:
(11) MINIMUM ALTIMETER SETTING (INS):
(12) D-VALUES:
(13) CONTRAIL FORMATION:
(14) ASTRONOMICAL DATA (UTC) AT ______Z:
SUNRISE/SUNSET/SUN ANGLES (ELE/AZ):
BMNT/BMCT/EECT/EENT:
MOONRISE/MOONSET/PCT ILLUMINATION/MOON ANGLES (ELE/AZ)/LUX VALUES:
3. ( ) OUTLOOK TO 48 HRS:
4. ( ) TACTICAL ASSESSMENT: (Note: Correlate the current/forecast weather to major concerns such as FARP/RGR ceilings and visibilities, severe wx, LZ ceilings and visibilities, bomb damage assessment (BDA), impact on EO systems/weapons, IFR conditions, etc.)

SAMPLE ASSAULT FORECAST (ASLTFCST) (Continued)

```
5. ( ) ELECTRO-OPTICAL SENSOR PERFORMANCE PREDICTIONS: (Note: Include
representative EO sensor performance predictions for associated assault
platforms and key environmental assumptions.)
6. ( ) RELEASED BY: (Note: Include when MINIMIZE imposed.)//
DECL/         //
```

USMC WX POINTS OF CONTACT

ANK	NAME	TITLE / UNIT	PHONE/E-MAIL
LtCol.	Resavy, William J. Jr.	Meteorological Specialist CMC	224-1835 FAX COMM 703 697-7343 William_J_Resavy@notes.hqi.usmc.mil
Maj.	Banks, Ernest D.	Weather Service Officer SPAWARS	577-0168 FAX COMM 619 524-3034 bankse@spawars.navy.mil
Maj.	Davis, Scott E.	Weather Service Officer/WTI CNMOC	485-4897 FAX 5332 daviss@cnmoc.navy.mil
Capt.	Dixon, James J	Weather Service Officer/WTI MAWTS-1	951-2534 FAX 2637 dixonj@yuma.usmc.mil
Capt.	Englert, Dave C.	Staff Weather Officer/WTI II MEF	751-8558 FAX 8597 englertd@clb.usmc.mil
Capt.	Colby, Brian K.	Weather Service Officer/WTI COMCAB EAST	582-2346 FAX 5628 colbyb@cherrypt.usmc.mil
Capt.	Webb, Michael J.	Weather Service Officer/WTI COMCAB WEST	577-4030 FAX 4031 webbm@miramar.usmc.mil
Capt.	Hutchison, Carl J.	Staff Weather Officer/WTI I MEF	365-9127 FAX 9170 hutchisonca@pendleton.usmc.mil
CWO4	Swosinski, Michael S.	Weather Service Officer/WTI KEESLER	597-3288 FAX michael.swosinski@smtp.cnet.navy.mil
CWO3	Usher, Ronald, S. Jr.	Weather Service Officer MCAF KANEOHE BAY	457-0404 FAX 2150 usherrs@mcbh.usmc.mil
CWO3	McBee, Eric R.	Staff Weather Officer/WTI III MEF	622-7773 FAX 7769 mcbeee1@okinawa.usmc.mil
CWO3	Smith, William B.	Weather Service Officer/WTI MWSG 27	582-2358 FAX 5691 smithw2@cherrypt.usmc.mil
CWO3	Bohannon, Donald L.	Weather Service Officer/WTI MWSS 171/MCAS IWAKUNI	253-4435 FAX 4801 bohannond@iwakuni.usmc.mil
CWO2	Hartman, John M.	Weather Service Officer/WTI MWSS 272/MCAS NEW RIVER	750-6828 FAX 6315 hartmanj@clb.usmc.mil
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