COMMITTEE FOR OPERATIONAL PROCESSING CENTERS (COPC)

RECORD OF ACTIONS 2016-01 MEETING

May 3-4, 2016
FNMOC, Monterey, CA

MEMBERS PRESENT

557WW:	Col William Carle
	Mr. Christopher Finnigsmier
FNMOC:	CAPT Russ Smith
	Mr. Bill Kerr
NAVO:	CAPT Gregory Ireton
	Mr. Mark Jarrett
	Mr. Lamar Russell (CSAB Chair)
NOAA/NESDIS	Ms. Vanessa L Griffin
	CAPT William R. Odell
NOAA/NWS/NCEP:	Dr. Bill Lapenta
	Ms. Carissa Klemmer (CSAB)
OFCM:	Mr. Ken Barnett (Executive Secretary)

PARTICIPANTS/OBSERVERS

557WW:	Mr. William Cowgill *[Phone]*
	Mr. Jason Rance *[Phone]*
	Mr. Ken Smith (CSAB) *[Phone]*
	Mr. Mark Surmeier (OD) *[Phone]*
	Mr. Ted Vroman (CSAB) *[Phone]*
AF/A3W:	Col Michael Gremillion
AF/LCMC:	Mr. Rod Grady *[Phone]*
CNMOC:	Mr. David McCarren
DISA:	Mr. Daniel Burt
	Ms. Victoria Walsh
DISA/STRATCOM:	Mr. Bruce Kenison (CCM) *[Phone]*
FNMOC:	LCDR Tristan Borne (CCM Chair)
	Mr. John Ertl
	LT Dustin Hocking
	Mr. Chuck Skupniewicz
	Dr. Mark S. Swenson
	Mr. Jim Vermeulen (CSAB)
NAVIFOR/CIO-2:	Mr. Kevin Greenlee (CCM)
NAVO:	Mr. Mark Middlebusher *[Phone]*
	Mr. Kyle Rushing (OD Co-Chair)
NOAA/NESDIS:	Mr. Keith Amburgey (CSAB)
	Mr. Steven Petersen
	Mr. Vince Tabor (OD Co-Chair) *[Phone]*
	Mr. Rick Vizbulis *[Phone]*
OFCM:	Mr. Floyd Hauth *[Phone]*
	Mr. Tony Ramirez (OD-Exe Sec) *[Phone]*
	Dr. Bill Schulz
OPNAV:	CAPT Erika Sauer
	CDR Christiaan van Westendorp (NOAA Liaison to the Navy)

Opening Remarks

CAPT Russ Smith welcomed all the participants at the meeting and those connected through remote means. All the attendees introduced themselves. Mr. James Vermeulen made logistical and administrative announcements. Mr. Lamar Russell provided comments on the benefits of updates from each of the centers and encouraged feedback on CSAB related topics. (Presentations are on the OFCM webpage http://www.ofcm.gov/copc/meetings.htm.)

Center Updates

FNMOC -- CAPT Russ Smith

CAPT Smith presented information on the mission, vision, functions and tasks of FNMOC. The number one mission is to ensure the fleet gets the right weather for safety of their operations. The vision is to be DoD's Premier Numerical Modeling Center. Functions include producing a variety of METOC products tailored to the mission requirements of DoD to include optimum path flight plans, specific ocean state data, custom (high resolution) weather prediction areas, operational climatology support, go/no-go decision tools, tactical decision aids (TDA), weapon system inputs proven to improve performance and accuracy, and a variety of other mission-critical METOC data, products, and services. FNMOC also serves as a DISA Node for 12 DoD organizations on the central California coast.

FNMOC's tasks include operating a High Performance Computing Center (HPCC), collaborating with NAVO, USNO, NRL, NCEP, NESDIS, and 557th Weather Wing (WW) and serving as the primary host of Navy Enterprise Portal-Oceanography (NEP-Oc) and alternate host of Flight Weather Briefer (FWB) servers.

CAPT Smith described the alignment of the production centers under the Chief of Naval Operation and noted that FNMOC was one of seven internationally recognized Global Numerical Weather Prediction (NWP) Centers.

He summarized the core capabilities in delivering Physical Battlespace Awareness (PBA) and in directly supporting Integrated Fires (IF). Its capabilities include cybersecurity-compliant systems and communications.

CAPT Smith also provided an overview of the current models and plans for future upgrades and other developments. The intent is to align Naval Oceanography Enterprise atmospheric and physical oceanographic modeling efforts to best support contingencies and operations. To accomplish this, modeling resources are optimized, modeling intellectual capital is aligned and prepared for future operations and to be part of the ESPC coupled system.

He reiterated the value of exchanges of data, products and service/capabilities with COPC partners.

In summary:

- FNMOC is the foundation for fleet safety; every forecast for ships, submarines, and aircraft start with FNMOC environmental prediction and production services.
- FNMOC provides the foundation for Physical Battlespace Awareness and provides direct support to Integrated Fires.
- Cybersecure assimilation, production and delivery is enabling assured C2. Only center that models the Global and Regional Atmosphere to DoD CS Standards.
- Provides climatological support to Joint and Naval Operations and this support is growing in importance.

NAVO -- CAPT Greg Ireton

NAVO's mission is to optimize sea power by applying relevant oceanographic knowledge in support of U.S. National Security.

NAVO has a highly skilled workforce. More oceanographers work at Stennis Space Center than any other place in the world and 67% of the workforce falls in the scientific area.

To accomplish its mission NAVO processes include Tasking, Collection, Processing, Exploitation and Analysis, and Dissemination (TCPED). Its collection and sensing tools include military survey ships, profiling floats, buoys, marine mammals, satellites and the use of national and international data exchange agreements. He described some of the instruments used on these assets to collect oceanographic data.

Decisions on where to deploy collection assets and the priorities, are based on four factors: Does NAVO have an operational regional/coastal ocean model in the area? Is there real-world significance or existing naval requirement? Is the area used for exercises / training by US Naval Forces? Do other countries deploy in the area and do they make their data readily available?

For ocean circulation modeling, NAVO runs a series of nested, higher and higher resolution ocean models (Navy Coastal Ocean Model -NCOM) around the world. These are data assimilating, three dimensional, full physics forecast models. Each day the ocean models assimilate millions of sea surface temperature and sea surface height (altimetry) data points from satellite sources. Thousands of real-time temperature and salinity profiles come in every day from ships, aircraft, profiling floats and ocean gliders. Atmospheric models from FNMOC provide surface forcing conditions.

The global models provide boundary conditions to regional models that provide boundary conditions to local models. In this stepwise fashion, higher and higher resolution features and processes are resolved to match the forecast requirements of operations occurring at the local level.

From the ocean models come forecasts of currents, temperature, salinity and water height and other information used in support of Anti- Submarine Warfare and Search and Rescue type operations.

The Navy DoD Supercomputing Resource Center, or Navy DSRC, one of five Department of Defense supercomputing sites, is located in NAVO spaces and managed by CNMOC.

NAVO is in the data management business and stores very large amounts of data. NAVO uses much of the data it collects to numerically model the ocean. The physical models that are run computationally require inordinate amounts of computing power. The large numerical models at NAVO are run at the Navy DSRC. Through an agreement with the DOD High Performance Computing Modernization Program, CNMOC reserves up to 15 percent of its computing power to use for operations. The remaining 85% is used by Army, Navy, Air Force, and Defense agency research and development users.

CAPT Ireton also described In-situ data inputs and impacts involving COPC partners. All satellite inputs, COPC and Non-COPC contributors, are included in NAVO products which are distributed to OPCs.

He summarized by noting that COPC partnerships enable access to full range of satellite data, access to observational data, sharing of model data, coordination of standards, and networks to efficiently and safely move METOC information among the partners. As a result Naval forces get the relevant and timely environmental data to support operations around the globe.

NESDIS (OSPO) -- Ms. Vanessa Griffin
Ms. Griffin presented the NOAA/NESDIS mission, vision, and organizational structure. She also covered the recent changes in key personnel in the line offices and in OSPO. She noted that in some cases filling office vacancies was taking considerable time and becoming an operational challenge.

Her operations summary covered launch dates for GOES R and JPSS-1 and the work in progress to prepare for data from these systems. GOES-R, JPSS, and ESPC Programs are working in concert with OSPO to ensure operational readiness. They are continuing to meet launch dates for GOES-R (10/13/2016) and JPSS-1 (1/20/2017).

She also noted that the performance of legacy systems is nominal however, the satellites and ground systems are aging. Ground transitions for DSCOVR have been completed and impending ground transitions for GOES-R and JPSS are being tracked carefully.

In the Polar Program the 3-orbit coverage provides the vast majority of data critical for 3-7 day forecasts and environmental monitoring. The Suomi NPP was named NOAA's primary polar-orbiting weather satellite on May 1, 2014 and observations/products are exceeding expectations.

In the Continuity of Operations Plan (COOP) various partial failover and other exercises have been conducted and more are scheduled in May.

The Navy's Next Generation Triton Drone Program is considering sites including Wallops Island. Their assessments are expected to be completed in June and operations are planned to begin in 2020.

NCEP -- Dr. William Lapenta
Dr. Lapenta provided a high level overview of the present status of the NWS and NCEP. The headquarters has pretty well completed their restructuring and now the attention has shifted to field operations and the need to reorganize that service area. Within the HQ the new alignment of the operations and planning functions has simplified and streamlined coordination processes to resolve problems, issues and concerns being addressed by the staff.

Budgeting factors and consideration of the economic value of operations has gained high level attention. All services and products need to provide intrinsic value to decision makers who are using weather/water/climate information in their decision processes. Impact based decision support service enables value added action by the decision maker. This impact based perspective helps to increase the credibility of weather information and also provides a better means of assessing the economic value of weather/water and climate information.

The success of this approach was shown in the January 2016 blizzard forecast for New York and the emergency measures taken that minimized the impacts on the public compared to past forecasts.

This approach to structural review the field operations at the WSOs will focus on stakeholder needs and be organized to provide the best economic value to users of the field's products and services. This will require changing many of the individual cultures that exist in the field activities.

Dr. Lapenta described the status of supercomputer upgrades at NCEP and recent and future model upgrades. He noted that decisions on model upgrades/revisions should stem from evidence based requirements.

He summarized current interactions that NCEP has with the Air Force and Navy in the mutually supporting/sharing COPC arena.

NCEP and NWS are continuing to evolve and undergoing a lot of change as they work toward achieving their mission and vision.

557th Weather Wing – Col Bill Carle

Col Carle described the diverse mission of the 557th: Maximize America's power through the exploitation of timely, accurate, and relevant weather information; anytime, everywhere. He also noted the benefits of COPC through getting together and dialog about shared data, communication synergies and mutual backup capabilities. The collaborations help the partners make better use of resources and jointly contribute to homeland defense.

The 557th workforce provides authoritative terrestrial and space weather information to win the fight...today and tomorrow. The organizational structure includes a wing staff and two weather groups.

1 WXG Mission and Organization has six OWSs and an OL to provide timely, accurate, and relevant environmental characterizations in support of AF, Army, and Joint Total Force operations.

The 2WXG provides AF's 24/7 Strategic Weather Production Capability – Five unique squadrons and a support function Detachment optimizing joint military and intelligence operations and readiness.

Its unique DoD missions include:

- 24/7 operational support for Intelligence Community
- Global cloud analysis and forecast modeling
- Global NWP for USAF & US Army operations
- Operate global network of solar observatories at Holloman, Learmonth, San Vito, Kaena Point, Sagamore Hill
- 24/7 DoD mission-tailored space environment analyses, alerts, forecasts, and warnings for JSpOC, NORAD, Space Operators, DoD HF and GPS users
- USAF/DoD's climate monitoring, analysis, and prediction capability
- Global snow cover/snow depth analyses
- American Forces Network (AFN) Weather Center -- Produce shows tailored to DoD/DoS deployed/stationed OCONUS
- USAF/DoD's center for airborne volcanic ash products & backup
- Aviation Weather Center/Storm Prediction Center/SWPC back up

Col Carle summarized the 557th numerical modeling capabilities and noted the AF emphasis on cloud forecasting and the need to provide its support on a global basis. He closed by again noting the value of COPC partnerships.

PDA Discussion -- Mr. Keith Amburgey/Mr. Rick Vizbulis

Mr. Keith Amburgey (NESDIS), WG/CSAB presented an overview and update on Product Distribution and Access (PDA) which is NESDIS's enterprise distribution for real-time users. It supports only secure transfer protocols (SFTP, FTP-S and HTTPS – pull only) and provides NESDIS with a scalable SOA based architecture that functions as a high availability and high performance distribution system. It enables users to directly manage their data subscriptions (within their allowed daily data volume limits) while OSPO can focus more efforts on management of the system. It also provides users with the ability to tailor products in order to meet their unique

mission requirements.

The PDA at NSOF (Suitland, MD) will support many missions; however, PDA at CBU (Fairmont, WV backup site) will only support the JPSS missions. Development status: The ESPDS has completed Qualification System Testing (QST) Part 2 verification. Initial results are at the 95% level.

The ESPDS Build has been deployed to support GOES R Validation testing at NSOF and CBU. In addition, the ESPDS ORR in support of GOES R has been decoupled from the ESPDS ORR for JPSS. JPSS Test Readiness Review planning and preparation are underway.

One of the challenges is that the end of the development contract with the industry partner is near. The intent is to award a follow-on contract by mid-July.

He closed with a schedule of upcoming operational reviews for JPSS, ESPDS and GOES-R and noted that the schedule may be in flux.

Working Group for Observational Data Update (Satellite)
Mr. Vince Tabor (NESDIS), WG/OD Co-Chair

Mr. Tabor summarized the status of satellite requests for each of the COPC partners. Most of the requests have been approved or implemented. He followed by showing the Gateway statistics for data volume to and from NESDIS to and from COPC partners from August 2015 through March 2016.

The COPC Action Item on Secure Protocols and the DAPE Gateway was discussed and is provided in the final section of this ROA.

Mr. Tabor briefed the recent satellite launches which included Sentinel-3A, Jason 2-Interleave, and Jason 3. Ongoing activities involve the MET-7 follow-on and acquisition of INSAT-3D data.

The Action Item on the Environmental Satellite Data Annex update was discussed and is summarized in the final section of this ROA.

Mr. Tabor also provided brief updates on the mission partner (federated) gateway, the product distribution and access, Himawari-8 data, DMSP, risk reduction for Windsat and COSMIC-2.

Working Group for Observational Data Update (Conventional)
Mr. Kyle Rushing (NAVO), WG/OD Co-Chair

Mr. Rushing began with an overview of the scope of responsibility of the WG which is to facilitate the acquisition, processing, and exchange of observational data among the National Operational Processing Centers (OPCs) and other related data centers. He reviewed the agencies participating in the WG and identified who represented each of the entities on the WG.

One of the primary current activities is to monitor and coordinate resolution of issues that arise due to the WMO text to BUFR transition. WMO is migrating from Traditional Alphanumeric Code (TAC) forms to Binary Universal Form for the representation of meteorological information (BUFR). OPCs are experiencing a complicated migration and have been responding to issues as they arise. Errors have arisen from decoding TAC prior to encoding in BUFR and other errors/problems in BUFR from TAC include missing information or erroneous metadata.

A metadata subgroup has conducted weekly conference calls since January 2015 to compile information on the errors and coordinate with POCs within NCEP and NWS to get the

problems/concerns addressed. WG/OD Action Items 2015-2.1, -2.2, -2,3, -2.4, -2.5, and -2.6 were generated to resolve these issues.

Mr. Rushing also provided updates on the WMO Integrated Global Observing System (WIGOS), which is a future observing framework in support of weather, climate, water and relevant environment services, and on the Observing Systems Capability Analysis and Review tool (OSCAR).

He closed by relating the WG's next immediate steps which are to continue to resolve metadata and data errors; develop a process of testing new BUFR data before distributing operationally via GTS; and, to develop a relationship with data collection programs that fall within the NWS/Office of Observations.

OFCM Update -- Dr. William Schulz

Dr. Schulz provided his assessment of OFCM and his proposed priorities for the coming two years. This assessment and outlook were presented to FCMSSR's subordinate group, the Interdepartmental Committee for Meteorological Services and Supporting Research (ICMSSR) in February and to the FCMSSR in April.

He presented the mission, structure, procedures, priorities, goals and expected outcomes for OFCM activities over the next two years. OFCM is a service organization and its customers are the agencies comprising the Federal Weather Enterprise (FWE). Their main product is sustained coordination efforts on cross-agency issues.

OFCM facilitates the exchange of information, plans and concerns among the FWE to help the nation get the most out of the approximately $5.3B spent annually on meteorological services and supporting research. In its advisory role OFCM provides strategic and operational views of interagency federal weather efforts in order to support related decisions at high levels.

In its planning role, OFCM produces and maintains foundational meteorological documents including the Federal Plan for Meteorological Services and Supporting Research, Federal Meteorological Handbooks, the National Hurricane Operations Plan and others as directed.

OFCM currently has 3 personnel vacancies on its staff and would like to fill these vacancies in 2017 and 2018 in order to fulfill mission responsibilities and provide the support for the Committees and Working Groups that are active and those that may need to reactivated.

The basic procedural guideline for OFCM is to engage agencies in areas where it can add value and assist with problem solving and complying with legal/policy mandates. The coordination role includes working with committees (ICMSSR and OSTP organizations) as well as extra-governmental agencies (AMS, AGU, NAS, Academia) on strategic issues, improving forecasts, facilitating data exchange and availability, ensuring continuity of observation quality and sources, and supporting sustainability of the FWE. (The latter three being linked to COPC interests.)

In its advisory capacity, OFCM assists multiple agencies address complex issues such as technical obstacles, timeline discrepancies, testing and evaluation, and expected costs and benefits. The intention is to provide executive/senior agency (including OMB) leadership with solid background and help to manage expectations and enable more informed strategic planning and budgeting. Example issues include follow-on sensor development and modeling coordination.

From meetings with the Agencies in recent months, several common interests emerged among the FWE agencies. These included multi-purpose radar CONOPS, FMH updates, determining the

economic value of forecast improvements, access to (and interpretation of) worldwide meteorological data, space based sensor data sharing, and coordinated approaches to modeling.

Dr. Schulz presented the CY 2016 and 2017 goals, both internal to OFCM and those addressing FWE issues described above. He also proposed some metrics that could reflect the effectiveness of the OFCM in meeting its mission. He closed by reiterating that OFCM is a service organization that enables cross-agency views and takes prioritization guidance from FCMSSR/ICMSSR.

Unified Ensemble Operations Committee Update -- Mr. Charles Skupniewicz

This committee evolved from a 2011 agreement and was established by the ESG and reports to the OPCs.

He noted that the NUOPC ensemble metrics from NCEP, FNMOC, and AFWA were briefed at 15 Oct ESG meeting. The ½ Degree Data Exchange upgrade was delayed to late 2015 due to delayed NCEP GEFS upgrade and communication line issues between CMC and NCEP.

NUOPC/NAEFS held a mini workshop on 24-25 February 2016 with face to face meeting of the Co-Chairs of the UEO Committee. The agenda focused on the development of NUOPC that includes data exchange of global and wave ensemble data, post process, ensemble week 3&4 forecast and future plans.

Research following a concern by FNMOC over the timing of the CMC raw ensemble data resulted in NCEP starting raw data processing 90 minutes earlier, much closer to real time and bias corrected data.

AF moved up operational GEPS processing to take advantage of this; GEPS suite had 5,000 unique users and about 4M product hits in the last 12 months.

He noted in an update on the ½ degree resolution that the plans for change over from 1 Deg to ½ Deg was delayed due to Canadian communication bandwidth issues. An internet solution has been put in place.

He also briefed NUOPC Products and Delivery Schedule Goals, NAEFS/NUE Model Configurations and the Planned Upgrades to NUE Baseline.

Regarding NUOPC Verification Metrics, AF GEPS continues to perform as expected with no problems that stand out. NUOPC Verification Metrics for the period April 1st 2011 – February 29 2016 were provided for all three individual bias corrected ensemble forecasts (NCEP/GEFS, CMC/GEFS and FNMOC/GEFS) and combined (NUOPC) ensemble (equal weights) against UKMet analysis. The plan is to add additional metrics based on bias corrected 500hPa height.

OPC Outage Mitigation -- Mr. Lamar Russell

Mr. Russell reviewed COPC Action Item 2015-2.1: Building on the OPC outage mitigation effort presented at the Fall 2015 COPC, develop a user oriented data source priority list or table per Center. Purpose: To increase the understanding of mission essential data exchange, single data sources, and data agency interdependencies, with the overall goal to mitigate the impacts on the OPCs when significant data outages occur.

OPCs identified the critical data inputs for their operations, identified critical products, with associated latency, began assessing mitigation options, alternate data sources, if primary provider is offline, alternate product line created at other center(s), and alternate pathways.

He identified an example of a critical OPC Data Exchange for Altimetry Data and Derived Product(s):

- Data Provider – NOAA/NESDIS/OSPO
  - Jason-2 & 3, AltiKa, Cryosat-2
- Data Recipient – NAVO (Core Processing Center)
- Derived Products
  - Sea Surface Height Anomaly
    - NAVO (ocean models)
    - FNMOC (atmospheric models)
    - NESDIS (Ocean Heat Content)
    - NCEP (via HYCOM initialization fields and SSHa product)
- Candidate Mitigation Strategies
  - COA 1: Navy Research Lab-Stennis as alternate source of raw altimetry data for NAVO

COPC approved the recommendation to close this Action Item and the recommendation of opening a new action to refine the OPC priority list, identify candidate data exchanges, and investigate mitigation approaches for the highest priority items at each OPC.

Mission Partner Gateway (formerly known as the NIPRNet Federated Gateway [NFG]) -- Ms. Victoria Walsh/ Mr. Dee Burt (DISA)

The Mission Partner Gateway (MPG) acts as a layer of defense providing detection, protection, and defense to the NIPRNet while exchanging data with non-DoD partners and other assets. Related to the TASKORD #J3-11-0508. This creates a clear boundary between DoD and others; enables improved sharing with key partners; and focuses cyber-attack detection, diagnosis, and reaction on the most important DoD missions. This gives DoD some ability to maneuver at the boundary in response to cyber-attacks.

Mr. Burt presented background information on the mission, architecture, where the system is deployed, plans for the future and connection processes. The architecture shows the IA Tools that service the NFG. There are six site locations in the U.S. and overseas.

The MPG continues to expand to a wide range of different communities including non-governmental entities. A connection process is in place through the MPG.

The Task Order is being updated with final approval for connections at the Joint Forces HQ (JFHQ). There are concerns about the latency between DISN nodes and testing is required to check the impact on the information/data being passed.

WG/CCM Status Updates and Recommendations
LCDR Tristan Borne (FNMOC), CCM Chair

LCDR Borne briefed the WG/CCM COPC Status Updates and Recommendations.

The purpose of the WG is to coordinate communication issues between the OPCs, monitor the effectiveness of those communications, and to do capacity planning and forward projection of capability needs. Each COPC has representative(s) on the WG.

Primary COPC connections have been upgraded and secondary connections have been established.

Status of COPC Action Items:

- COPC Action Item 2013-1.5: Implement an end-to-end latency test exchange using representative proxy data from NOAA (NESDIS and NCEP) through NFG to each DoD OPC.
    - Overall concept: Establish the 2nd connection, establish a connection to a NFG, and test latency with a large data set over a long period of time (to not impact the operational path).
    - Utilize NFGs within COPC network to exchange data between DoD and NOAA.
        - DISA's published SLA guaranteeing DISA node to DISA node will NOT exceed 100ms CONUS and 150ms OCONUS.
    - CCM recommends keeping this action item open.
- COPC Action 2015-1.4: Make a recommendation about the utilization of the 2nd COPC network path (Boulder). [Concurrent usage or regular scheduled failover tests].
    - CCM recommends utilizing as Failover Path with routine testing.
    - Configure as a protected circuit allowing automatic fallback if primary COPC path suffers an outage.
    - Provides for optimum network reliability and robustness.
    - CCM recommends closing this action item.

CCM's concerns of note to COPC about the NFG:

- With these new enterprise programs, what do we do about inconsistent capacity impacting time-sensitive METOC data?
- How/who do we get to authorize a quality of service scheme?
    - For either location AF must deal with the AF-gateway issues before they can receive NOAA data via the NIPRNet.

OPC Data Distribution Systems

557 WW Data Distribution Systems (Moving Weather)
Mr. Rod Grady, LCMC

Machine to machine mode is the most applicable mode for COPC. Subscription-data push will be transferring to Moving Weather.

Web services-data-pull will be transitioning to Open Geospatial Consortium (OGC) services. Web Page – interactive data currently is Air Force Weather Web Services (AFW-WEBS) and in the future will be AFW-WEBS 3.0. This is multi-use case driven for use by pilots, base operations etc.

Only impact to COPC is through subscription mechanism. The Moving Weather transition schedule is based upon task order award of January 16. Initial plan:

- FNMOC/NAVO transition complete NLT Jan 17
- NOAA transition complete NLT Oct 17
- Adjustments possible given other COPC network changes

Impacts to COPC partners: Minimal impact anticipated. Will fully test new connection before cutover; same port and protocol; no direct benefit to COPC. However, impact to 557 WW by lowering total cost of ownership, eliminating use of expensive IBM hardware and eliminating use/maintenance of unique GOTS by pilots, base operations, etc.

FNMOC Data Distribution Systems (Data Access, Receive, Transmit [DART])
Mr. James Vermeulen (FNMOC), WG/CSAB

Initial Operational Capability (IOC) for DART included the following core capabilities:

- Automated SFTP file push and SFTP file retrieval.
- Automated local file copy (accessing multiple global file systems reducing the number of file transfers).
- Significantly improved application IA compliance.
- Web based GUI to manage daily data transfer and DART sub cluster configuration and failovers

DART IOC features have substantial capability improvements over legacy systems and more flexibility for data formats.

NCEP Data Distribution Systems (IDP & TG)
Ms. Carissa Klemmer (NCEP), WG/CSAB

Data Distribution and Ingest; Integrated Dissemination Program (IDP) Big Picture shows 100% dissemination backup with College Park and Boulder with overall functionality in place at College Park as of January 2016.

The reason for this arrangement is that the TOC Gateway hub had 2 locations in Silver Spring, MD (primary) and Fairmont, WV (backup) but they were not independently redundant.

In April 2015, NCEP Central Operations (NCO) merged with the Telecommunications Operations Center (TOC); the goal being to merge organizational resources in both systems and personnel.

COPC IDP coordination items:
- FNMOC: First round moved into IDP November, 2015. Second round is in early stages
- 557WW: Accounts have been created for ftps and are being tested. The move from "tgdata" to IDP "tgftp" is awaiting careful coordination from the network teams between 557WW and NCEP. 557WW requested a new line to better support operations, NCEP is in the process of standing this up for testing.
- NAVO: Accounts have been created for ftps and testing will begin soon.
- NESDIS: In the processes of validating dual data feed.

FNMOC file transfer issues: NCEP is tracking an issue with being unable to obtain a reliable feed from Monterey. At this time there is no immediate path to resolution, but dialog continues.

COPC successes:
- FNMOC: Currently testing the 0.5 degree WW3 Ensemble that will be used in the next FNMOC NCEP Combined Ensemble System (NFCEns)
    - In the process of receiving the 0.5 degree NAVGEM Deterministic model to replace the 1.0 degree.
- 557WW: As reported, NCEP recently began providing the 557WW Global Ensemble model products publicly through NOMADS.
- NAVO: NAVO has been working closely with EMC to coordinate updating the Real-Time Ocean Forecast System (RTOFS) off the soon to be upgraded HYCOM restart files.

WG-CSAB Updates
Lamar Russell (NAVO), WG-CSAB Chair

<u>OPC Outage Mitigation</u>
COPC Action Item 2015-2.1: Building on the OPC outage mitigation effort presented at the Fall

2015 COPC, develop a user oriented data source priority list or table per Center.

- Recommend closing this action.
- Recommend opening a new action.

NEW Action Item 1: Refine the OPC outage mitigation priority list, identify candidate data exchanges, and investigate mitigation approaches for the highest priority items at each OPC. (Additionally, add a column that calls out the negatives when using the alternative data solution and make the document for internal OPC use only.
Purpose: To increase the understanding of mission essential data exchange, single data sources, and data agency interdependencies, with the overall goal to mitigate the impacts on the OPCs when significant data outages occur. Priority: M, Advocate: CSAB, Suspense: At the next COPC.

<u>COPC Terms of Reference Update</u>
COPC Action Item 2015-2.2: Review and recommend updates to the COPC Terms of Reference. Admin changes to membership names and locations.

- COPC's reports up to the Interdepartmental Committee for Meteorological Services and Supporting Research within the Federal Coordinating Infrastructure.
- FYI - COPC agencies' ICMSSR members are: Dr. Uccellini, Dr. Volz, Mr. Stoffler, and Mr. Livezey (chair).
- Subgroups TORs: only changes are administrative to OPC membership names and working group names.
- JAG/CCM will now be WG/CCM.
- WG/OD TOR was reworked and signed 5/2014. They have an internal AI to update again.
- Committee TORs are "blessed" by ICMSSR and all TORs are signed by the Secretariat of ICMSSR.
- CSAB recommended closing this action and COPC approved.

<u>Data Exchange</u>
COPC Action Item 2015-1.4: Make a recommendation about the utilization of the 2nd COPC network path (Boulder). [Concurrent usage or regular scheduled failover tests].

- CCM recommends utilizing as failover path with routine testing. Configure as a protected circuit allowing automatic fallback if primary COPC path suffers an outage. CCM recommends closing this action item.
- Approved by COPC.

COPC Action Item 2014-2.1: Determine if data can be exchanged via the DAPE Gateway using secure protocols.

- Reviewed in the WG/OD briefing and recommended closing this action.
- Recommended opening a new action to implement secure protocol exchanges.
- COPC approved closing this action but did not approve the recommendation to open a new action. OPCs do not set the security requirement but instead work to follow the mandate from the authorized groups.

<u>DAPE Agreement and the ESDA</u>
COPC Action Item 2013-2.1: Complete a new DAPE agreement for signature.

- MOA update staffed and signed Sep 2013 with minimal changes

- HAF/A3O-W requested AFWA pursue revision to align with AF GC review comments (AFWA took the lead to develop the first draft of revised DAPE and ESDA)
- Revision prior to scheduled expiration on hold as HAF A3W is investigating agreement authority and appropriate signature-level.
- CSAB recommends pursuing a new DAPE MOA for the Spring COPC 2017 to be ready for signature on Sept 30th 2018 (when the 5 years term ends).
- Recommend closing this action.

COPC Action Item 2013-2.2: Review and update the Environmental Satellite Data Annex to the DAPE MOA.

- Updated version completed.
- Air Staff and ACC are looking into the AF signature level.
- COPC requested that the DAPE MOA and ESDA be reviewed at the higher level (ICMSSR).

Testing and Documentation

COPC Action Item 2013-1.5: Implement an end-to-end latency test exchange using representative proxy data from NOAA (NESDIS, TOC, and NCEP) through MPG (NFG) to both Navy OPCs.

- Reviewed in the WG/CCM briefing and recommended keeping open.
- COPC approved. DISA requested that the OPC provide representative test data as soon as possible for running through the security tools at the MPG (NFG).

COPC Action Item 2013-1.9: Review and update the Federal Plan for Cooperative Support and Backup Among Operational Processing Centers (FCM-P14-2012).

- OFCM and CCM are updating the COPC network section.
- OPCs are reviewing the document to update the organizational changes.
- CSAB recommended keeping this action open and COPC approved.

GOES-R Data

COPC Action Item 2012-2.7: Each OPC to provide anticipated GOES-R implementation strategy; expressly addressing data receipt mechanism/methodology and impacts to processing infrastructure.

GOES-R is scheduled to launch in Oct 14, 2016.

- Air Force working contracts for DRO receipt, processing and assimilation of GOES-R at Offutt AFB.
- NAVO and FNMOC are continuing to pursue GOES-R Direct Read-out capability, using the Navy ESRP Program (POM18 planning)
    - Plan to use PDA "Operational" delivery until DRO capability is established.
    - NRLMRY has installed antennas. Plan to leverage that capability and recommend movement into ESRP to address continued O&S costs
- CSAB recommends keeping this action open.
- COPC approved. However, OSGS expressed concern about the 2 Navy OPCs getting their GOES-R data from the PDA.

Ensemble Data Distribution

COPC Action Item 2012-2.8: NCEP (in particular NCO) will host a teleconference meeting/s with the DOD OPCs to develop the way forward with NOMADS. 1) Investigate alternative paths

(besides Internet) for the operational use by the OPCs. 2) Discuss architecture and backup capabilities. 3) Solve getting the DOD data flows on the NOMADS server for distribution.

- 1 and 2 will be covered by the 2nd DOD/NOAA connection and IDP at Boulder.
- 3 - Dissemination of 557WW Ensemble products from the College Park NOMADS:
- 557 WW made the necessary modifications to their GRIB to meet the WMO standard table definitions.
- NCEP is working to make the products fully NOMADS distributable.
- Scheduled implementation April 26th, backup for critical weather April 28th.
- CSAB recommends closing this action.
- NCEP confirmed that the 557WW ensemble data is now available on NOMADS, so COPC approved closing this action.

Himawari 8 Data

COPC Action Item 2012-2.9: NESDIS to track and share JMA rebroadcast and HRIT downsampled product offerings. WG/ODAA to assess mutual center needs for obtaining Himawari via cooperative share relationship with JMA.

- H8 data (16 channel) flowing from NOAA STAR to NCEP and NAVO.
- Himawaricast used for NWS and AF (via the MARK IVB)
- 557 currently getting the 5 channel feed from MARK IVB (and sending to FNMOC).
- AF working to get 2 additional channels using MARK IVB (potential exists to obtain all 14).
- Recommend closing this action and opening two new action items.

New Action Item 2: Request an interim solution of distributing the H8 data from NCEP across the COPC Network circuits.
Purpose: To improve the IA posture, utilize the increased Navy bandwidths, and provide a more reliable data exchange.
Priority: H
Advocate: CSAB
Suspense: At the next COPC (Fall 2016).

New Action Item 3: OPCs to receive the H8 data operationally from PDA.
Purpose: To have operational support (24x7) of the data feed that is used to create OPC mission critical products. (Himawari 8 data is anticipated to be available on PDA in the summer of 2017).
Priority: M, Advocate: CSAB, Suspense: Update at the next COPC.

Executive Session Highlights:

- Discussion of having only 1 COPC a year, but the group decided to stay with the current format of twice a year. Justification, they don't want to lose the momentum they currently have within COPC and the subgroups. Additionally, the DOD CO members change positions within 2 to 3 years and with scheduling conflicts it could be difficult to influence COPC direction.
- CSAB will only use the Outage Mitigation spreadsheets internally within the OPCs. We will also add a column about the negatives when using an alternative mitigation data feed/product. Overall, they see the value in this effort but they don't want anyone else to misinterpret the backup or "redundancy" element.
- Next COPC at NAVO, need to find two different weeks if possible to send out a request for

availability. The election week will not work with Election Day Tuesday the 8th and a holiday on the 11th. Some discussion about the first week in Dec along with the first week in Nov but NAVO will determine and Ken Barnett will go out with the email to COPC.