Extended TFM Coordination Through Collaborative Planning

(Improvements to the Collaborative Planning Process)

NBAA 64th Annual Meeting and Convention
Friends and Partners in Aviation Weather

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What is Collaborative Planning?

- **Objective is to provide a long-range look ahead to improve efficiency and predictability of the NAS using a collaborative and longer-range action plan.**
- **Intended to be an ongoing information exchange among NAS stakeholders.**
- **Proposed to begin around 18z to discuss next day strategic planning.**

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Motivation

- **CDM (WET) longer range forecasts (Convection, Winter Weather).**

- **Foreign and Domestic carriers operating international flights already perform long-range strategic planning 24 hours in advance.**

- **Day 1 and Day 2 strategic planning coordination at the ATCSCC International desk using:**
- *Social media (Saba Centra)*
- *TAF's*
- *ECFP (Extended Convective Forecast Product)*
- *Jet Stream analysis*
- *High Level Significant Weather (SIGWX) forecasts*

- **Participants discuss pertinent weather forecasts, tracks, and a strategic plan based on that information.**

- **Discussions include; DAY 1 CONUS arrivals/departures and subsequent arrivals back to the CONUS the following day (Day 2).**

Extending TFM Coordination Through Collaborative Planning

- **Implementation of an extended TFM planning horizon for the NAS through the FAA proposed Collaborative Planning initiative.**
- **Utilize currently available long-range thunderstorm forecasts.**
- **Deploy Collaborative Planning as a phased approach.**
- **Numerous observational and post-analysis case studies of strategic planning at the ATCSCC for the FAA and WET.**
- **Results demonstrated long-range thunderstorm forecasts can provide reliable information to focus strategic TFM decision-making efforts.**
- **Since Collaborative Planning begins the day before, it requires forecasts for thunderstorms beyond the temporal scope of the CCFP.**
- **Longer-range planning will require longer-range forecasts.**

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Collaborative Planning Requires Longer Range Thunderstorm Forecasts

(Candidate Thunderstorm Forecasts)

- **4 long-range thunderstorm forecasts are identified as candidate products to support collaborative planning:**
  - *Extended Convective Forecast Product (ECFP),*
  - *Aviation Impact Guidance for Convective Weather (AIGCW),*
  - *Localized Aviation MOS (Model Output Statistics) Product (LAMP),*
  - *Storm Prediction Center (SPC) Experimental Thunderstorm Outlook*

- **<u>Summary of Forecasts</u>:**
  - **These forecasts are well suited for use with collaborative planning due to aviation-centric characteristics.**
  - **There is no common agreement within the FAA or stakeholders on which to use for extended planning.**

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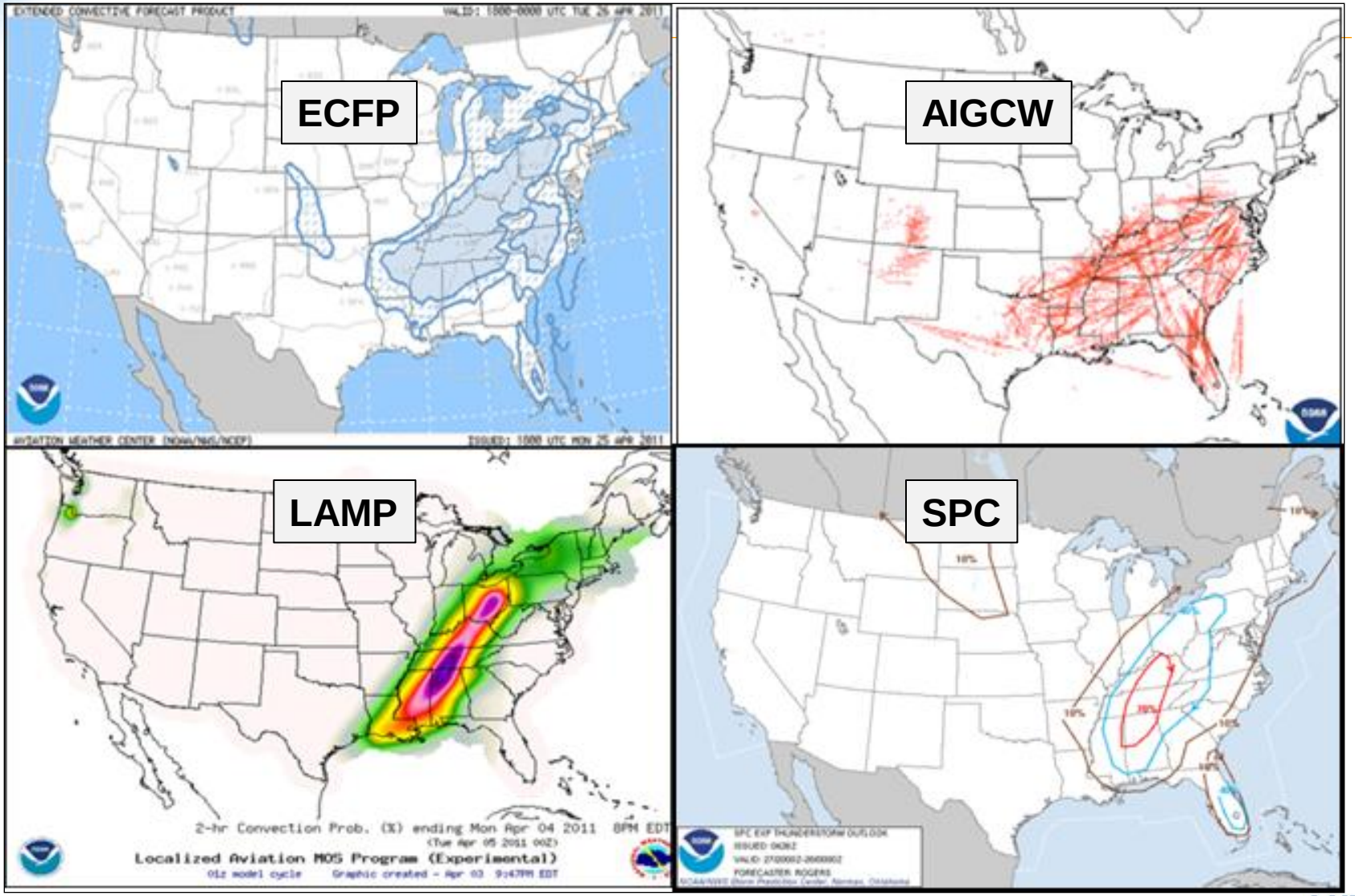
Long-Range Thunderstorm Forecasts



Demonstrating Extended TFM Planning

(a Collaborative Planning feasibility exercise)

- **Conducted a high level experiment to assess how ANSP and Users might react in a collaborative extended planning environment focusing on the "Day Before (18-24 hours ahead)" period.**

- **<u>Experiment Construct:</u>**
  - **Internal staff with either ANSP or User ATM Planning experience responded to surveys using 4 scenarios with thunderstorms in the NAS.**
- **<u>Experiment Results:</u>**
  - **Suggest that more long-range planning takes place today in the User community than in the ANSP community.**
- **<u>Experiment Conclusions</u>:**
  - **Suggest both groups would perform more strategic planning activities 18-24 hours ahead of a thunderstorm event.**
  - **Interpreting and considering the same weather information, users were more agreeable to early coordination of plans with ANSP.**
  - *Assessing the potential NAS impact based on the forecast.*
  - *Planning for thunderstorm impact mitigation actions.*
  - *Conduct external coordination, communication, and collaboration*.

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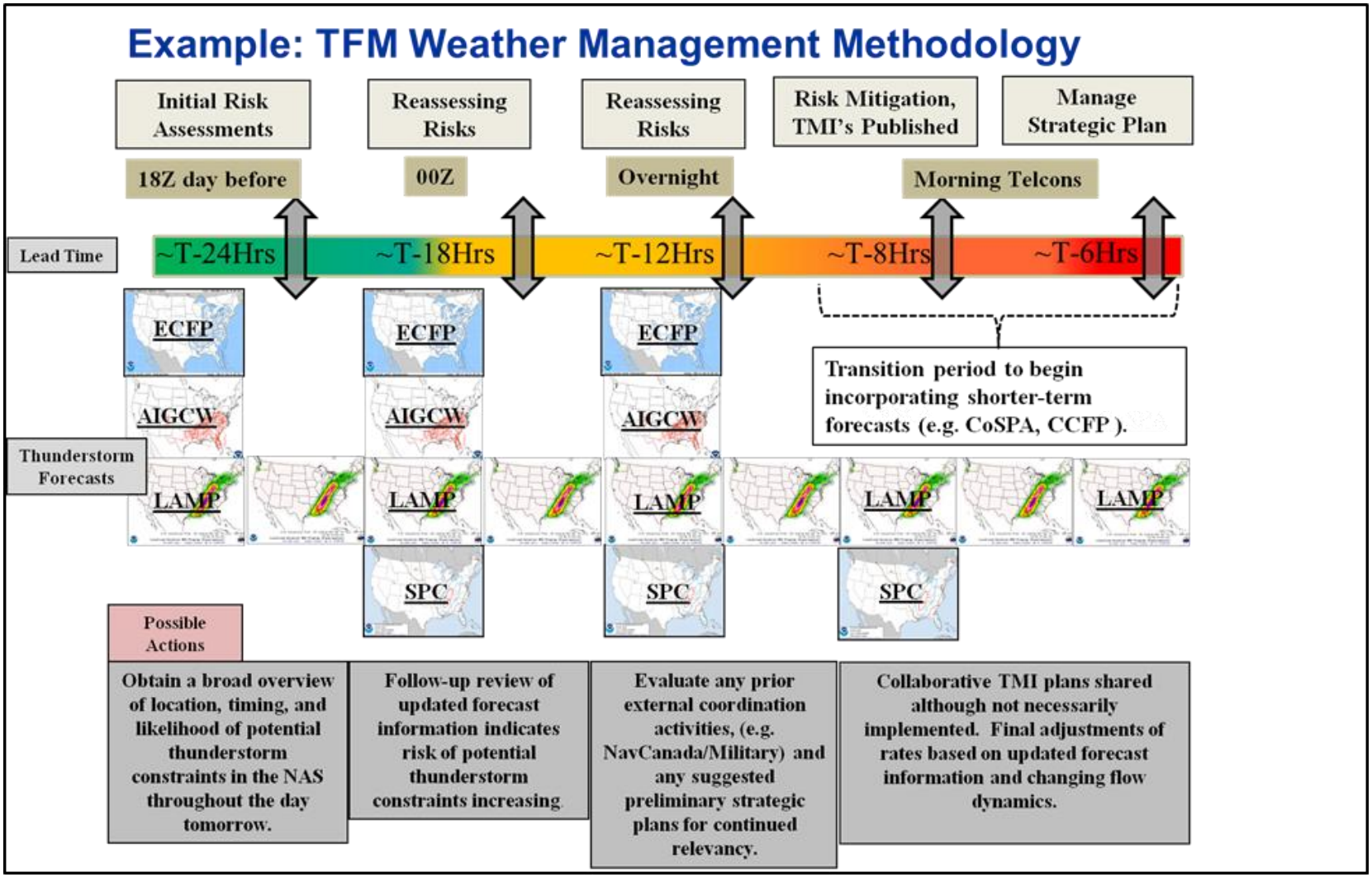
Forecast Use Scenario:
Hypothetical example using long-range forecasts for a thunderstorm event in the NAS.



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TFM Matrix for Extended TFM Planning

- **Incorporates a structured, multi-tiered alerting system into extended TFM planning.**
- **Alerts stakeholders to the likelihood of traffic management initiatives using current FAA vernacular "Possible", "Probable", and "Expected".**
- **Details regarding specific flow rates unrealistic at extended timescales.**
- **Allows hedging of previous decisions to evolve with the forecast.**

NWS / FAA	NWS Guidance (formal directives) translates to	FAA Strategic Planning (informal directives)
NWS: Outlook READY FAA: Possible	Issued to address the potential for hazardous weather and provide the information to those who need considerable lead time. Although too far in advance to contain specific details, the outlook highlights potential hazards and explains possible threats.	Likelihood of a specific TMI based on forecast constraint location and probability of occurrence. Can be used as a trigger for the ATCSCC to coordinate with NavCanada and DoD for potential routing/airspace options.
NWS: Watch SET FAA: Probable	Risk of hazardous weather has increased significantly to provide enough lead time so those who need to set their plans in motion can do so. A watch means that conditions are favorable for the development of certain phenomena, but the conditions are not yet occurring or imminent.	Increasing risk of a constraint based on subsequent issuances of the weather forecast. ATCSCC and Stakeholders have pre-coordinated a plan of action for delay mitigation based on previous assessments and current reassessment of risk. TMI objectives shared and agreed upon.
NWS: Warning GO FAA: Expected	Issued when hazardous weather is occurring, imminent or likely. This is the cue to immediately implement plans to protect life and property.	ATCSCC TMI's incrementally implemented (hedging) and continuously re-evaluated for efficiency prior to being subsumed by tactical operations.

Potential Benefits and Challenges of Collaborative Planning

- **Potential Benefits:**
  - **Additional planning time for complex logistics such as appropriate staffing and obtaining approval to use various airspace resources (e.g., Canadian and offshore military airspace).**
  - **Common constraint and mitigation plan awareness.**
  - **Increased predictability to the NAS.**
- **Implementation Challenges:**
  - **Technology**
  - **Secure infrastructure requirements**
  - **Staffing**
  - **Change implementation**

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Phased Approach to Deployment

- **Phased implementation incorporates change incrementally.**
- **Experience gained with each phase allows continued refinement of processes and procedures.**

Phase 1: ***Use of commercially available collaboration software and further demonstration exercises to refine the concept.***

Phase 2: ***Initial deployment strategy utilizing the 2115EST SPT by adding an additional agenda (NAS Outlook) item using the ECFP as the single source.***

Phase 3: ***Expand the temporal scope using social media and additional candidate thunderstorm forecasts.***

Phase 4: ***Full deployment of collaborative planning and automation starting at 18z the day prior to an event with information shared between desired system tools including; modeling tools, traffic management tools, and operational analysis.***

Summary

- **Collaborative Planning requires a change in the planning process where the use of longer-range weather products is an integral change component.**
- **Full implementation of Collaborative Planning and integrating long-range weather products requires additional demonstration exercises to mature the concept.**
- **Demonstration workshops could enable stakeholders to develop a common Collaborative Planning vision and agreed upon processes and procedures.**
- **Initial deployment of the Collaborative Planning process during the 2115EST Planning Telcon as a NAS Outlook agenda item.**
- **Integrate currently available weather products utilizing the TFM Weather Matrix as a risk management guide.**
- **Deploy as a phased approach.**

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