



Federal Aviation  
Administration

# **Air Transportation Information Exchange Conference - (featuring AIXM, WXXM and FIXM)**

*“Enabling Information Sharing thru Common Services”*

**August 30, 2011 - September 1, 2011  
NOAA Science Center & Auditorium  
Silver Spring, Maryland**

## **Program**

# Air Transportation Information Exchange Conference - (featuring AIXM, WXXM and FIXM)

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Colleagues:

On behalf of the Aeronautical Information Management (AIM) Directorate, I would like to take this opportunity to welcome you to the Air Transportation Exchange Conference. We are proud to continue the tradition of hosting this premier event for the air transportation community. We have endeavored to build upon our past successful efforts and expand our competencies by broadening the appeal of the conference to a wider audience, including other government agency professionals, the research community, international partners, and industry leaders.

This year the conference includes three exchange models:

1. Aeronautical Information Exchange Model (AIXM)
2. Weather Information Exchange Model (WXXM)
3. Flight Information Exchange Model (FIXM)

While most of you are here to network and exchange ideas on the model for which you are responsible, we hope you will expand your horizons and include in your discussions our colleagues who are responsible for other models. We believe we all have something to learn from each other which can make our efforts easier, more enlightened, and more enjoyable.

In addition to the exchange models, we will be discussing the delivery of the information through services, the services themselves, and the management of the information. From an information management perspective, this is essential. Our keynote presentation, information sessions, and exhibitor displays were crafted with that objective in mind.

We selected this year's theme, "Enabling Information Sharing thru Common Services" to encourage the cross-pollination of ideas, concepts, practices, procedures, techniques, and tools that are necessary to encourage the development of a single, integrated, end-to-end information sharing environment.

I hope you will make the most out of this conference by networking with your peers, discussing the critical issues that affect us today, and helping to find strategies to minimize these issues in the future.

Thank you and welcome!

Kind Regards,

A handwritten signature in black ink that reads 'Deborah Cowell'. The signature is fluid and cursive, with a large loop at the beginning.

**Deborah Cowell**

*Conference Chair and AIM Information Architect*

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Dear Participant,

The AIXM 5 implementation is getting momentum world-wide and there are strong signals from industry that there is a need for stability and predictability in the model evolution. We hope that the AIXM Change Control Process that is launched on the occasion of the Conference will fulfill these expectations. All AIXM stakeholders will be given the possibility to raise issues, propose solutions and state their opinion with regard to a formal change proposal. The release of new AIXM versions and the development of data conversion rules to be applied between different versions will also be in the scope of this process. An AIXM Change Control Board, composed of representatives from different stakeholder groups, will have the task to supervise the process and guarantee for its fairness and transparency. We are looking forward to seeing the AIXM user community, in particular industry, playing a strong role in the AIXM Change Control Process. Finally, we are pleased with the progress made in the ICAO AIS-AIM Study group with the formal adoption of AIXM as Guidance Material in support for the ICAO Annex 15 requirements for digital data management and digital exchange.

Eurocontrol is also looking forward to see progress in the development of an overall ATM information model, encompassing the aeronautical, meteorological, flight, flow and other related ATM data domains. We are fully committed to ensure that the progress made in the definition of the AIXM and WXXM models will be soon followed by similar progress in the Flight Data area. Our strong commitment in SESAR towards the development of an ATM Information Reference Model (AIRM) for Europe is paired with an equal commitment for the development of globally applicable solutions and harmonization between the regional and the global developments. We expect the Conference to be an excellent occasion for progressing the trans-Atlantic and the global cooperation in the air transportation information domain.

With sincere hopes for a successful conference, in the name of the Eurocontrol participants,

**Eddy Porosnicu,**

*Senior AIM Specialist - AIXM, Digital NOTAM, eAIP*

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Air Transportation Community:

Welcome colleagues, industry leaders and international partners. It is my pleasure to be part of the 2011 Air Transportation Information Exchange Conference. Knowing how successful this conference has been in the past, the opportunity to include the Flight Information eXchange Model (FIXM) in the topics to be covered is a testament to the conference's breadth of interests.

While the exchange of flight information is not a new concept; FIXM is, in fact, in its infancy. It is our hope that everyone here takes this opportunity to learn what they can about FIXM's development, as well as its place in the information exchange realm; specifically its relationship to AIXM and WXXM. I encourage everyone to join in the discussions regarding FIXM as the week progresses.

We can learn a great deal from each other and the relationships we build this week will have a positive impact advancing FIXM development. I look forward to our discussions.  
Thank you.

Regards,

A handwritten signature in black ink, appearing to read 'Richard Jehlen', with a long horizontal flourish extending to the right.

**Richard Jehlen**

*Director*

*Planning & Performance,  
System Operations Services,  
Air Traffic Organization, FAA*

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Colleagues:

On behalf of the National Oceanic and Atmospheric Administration (NOAA) and the WXXM community, I would like to welcome you to NOAA's Silver Spring campus and to the 2011 Air Transportation Information Exchange Conference. It is our pleasure to host and participate in this conference. The development of WXXM is an important step in modernizing the exchange of weather information. We welcome the opportunity to exchange information with our industry, FAA, and EUROCONTROL partners and with the AIXM and FIXM communities. We are looking forward to an informative and productive week.

Regards,

**Mark Miller**

*Program Manager*

*NOAA NextGen Weather Program*

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## Speaker Biographies

(listed in Alphabetical Order)

### Welcome and Intro Speaker:

#### **Nancy Kalinowski**

*Vice President, System Operations Services*



Ms. Nancy Kalinowski is the Vice President of System Operations Services for the Air Traffic Organization (ATO), Federal Aviation Administration (FAA). She is responsible for overall national guidance for the air traffic flow management, airspace management and aeronautical information management, as well as the delivery of safe, secure, and efficient air traffic management and flight services for the National Airspace System (NAS).

Nancy directs the daily ATO interface with the Department of Defense (DoD), the national and individual military command levels, and the Department of Homeland Security for all air transportation security issues. During her more than 30-year career with the FAA, she has served in management and executive positions in human resource management, budget, communications, flight services, airspace management and design, aeronautical information management, and aviation safety. Notably, she has been at the forefront of the redesign of airspace above the New York, New Jersey, and Philadelphia metropolitan areas — the busiest and most complex airspace in the nation.

Nancy has received numerous awards during her career, including the prestigious Secretary of Transportation's Gold Medal Award for outstanding achievement and leadership to address delays and aviation congestion in the New York area.

Nancy earned a Bachelor's in Psychology from Eckerd College, St. Petersburg, Florida, and holds a Master's in Industrial Psychology from University of Central Florida.

### Keynote Speaker:

#### **Vicki Cox**

*Head of FAA NextGen*



As the Air Traffic Organization's Senior Vice President for NextGen and Operations Planning, Vicki Cox provides increased focus on the modernization of the nation's air traffic control system by providing systems engineering, research and technology development, and test and evaluation expertise. She is also responsible for NextGen integration and implementation along with the NextGen portfolio.

Within the FAA, she has served as the Director of the ATO's Operations Planning International Office, the Director of Flight Services Finance and Planning and the Program Director of the Aviation Research Division. She came to the FAA from the Department of Defense, where she was Director of International Technology Programs in the office of the Director of Defense Research and Engineering.

She graduated from Converse College and received a master's degree from East Carolina University. She has a certificate in U.S. national security policy from Georgetown University. She is a DOD Level III Certified Acquisition Professional in systems planning, research, development and engineering and holds a private pilot's license.

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## Agenda

Day 1 – August 30, 2011	
<b>08:00 – 09:00</b>	<b>Registration and Exhibits</b>
09:00 – 9:20	<b>Welcome and Introduction – Nancy Kalinowski</b>
09:20– 09:50	<b>KEYNOTE Speaker – Enterprise Services</b> <ul style="list-style-type: none"><li>• <i>Keynote: FAA –NextGen – Victoria Cox</i></li></ul>
09:50 – 10:00	<b>Themes and Logistics – Deborah Cowell</b>
<b>10:00 – 10:30</b>	<b>Coffee Break / Exhibits</b>
10:30 – 12:30	<b>International Developments</b> <ul style="list-style-type: none"><li>• <i>US/EU Coordination – Steve Bradford</i></li><li>• <i>The Need for Global Information Management – Paul Bosman</i></li><li>• <i>ICAO – AIM Development in a Global Context – Michael Hohm</i></li><li>• <i>MET Development in a Global Context - Dennis Hart</i></li></ul>
<b>12:30 – 1:45</b>	<b>Lunch/Exhibits</b>
1:45 – 3:00	<b>Information Structures</b> <ul style="list-style-type: none"><li>• <i>AIXM Status and Evolution – Eddy Porosnicu</i></li><li>• <i>WXXM Status and Evolution – includes WXXM 2.0 and Beyond - Aaron Braeckel</i></li><li>• <i>Flight Information Exchange Model (FIXM) – Rich Jehlen</i></li></ul>
<b>03:00 – 03:20</b>	<b>Break - Exhibits</b>
03:20 – 05:00	<b>Applications</b> <ul style="list-style-type: none"><li>• <i>Air Carrier – Electronic Flight Bag – Gary Church (Aviation Mgmt)</i></li><li>• <i>AIXM Viewer – Glen Landry &amp; Trent Tinker</i></li><li>• <i>NOTAM News/demo – Shaelynn Hales</i></li><li>• <i>MET Products enabled by WXXM – Dave Pace</i></li></ul>

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## Agenda

Day 2 – August 31, 2011	
<b>08:00 – 09:00</b>	<b>Exhibits</b>
09:00 – 10:15	<b>Common Services</b> <ul style="list-style-type: none"> <li>• ACS – Navin Vembar</li> <li>• NNEW/4-D Weather Data Cube – Alfred Moosakhanian &amp; Mark Miller, NNEW</li> <li>• SESAR – Information Services Focusing on AIS and MET – Dennis Hart &amp; Roger Li</li> </ul>
<b>10:15 – 10:45</b>	<b>Coffee Break – Exhibits</b>
10:45 – 12:15	<b>Applying Common Services – Emerging Concepts</b> <ul style="list-style-type: none"> <li>• Flight Info Demo – Midori Tanino</li> <li>• Digital Briefing Concepts – PIB – Eddy Porosnicu</li> <li>• Using Systems Thinking in Developing WXXM-Based System of Systems – Tom Day</li> </ul>
<b>12:15 – 1:30</b>	<b>Lunch/Exhibits</b>
1:30 – 3:00	<b>Exchange Protocols and Services</b> <ul style="list-style-type: none"> <li>• A Developers Experience with SWIM Panel Discussion (1 hour) <ul style="list-style-type: none"> <li>- Panel Moderator – Ahmad Usmani</li> <li>- AIM Service Provider – Navin Vembar</li> <li>- Weather Service Provider – Oliver Newell</li> <li>- Service Governance – Paul Jackson</li> </ul> </li> <li>• SESAR Registries – European Speaker</li> </ul>
<b>3:00 – 3:20</b>	<b>Break – Exhibits</b>
3:20 – 5:00	<b>Services (Continued)</b> <ul style="list-style-type: none"> <li>• OWS8 – Nadine Alameh</li> <li>• Efficient XML – Aaron Braeckel</li> <li>• Distribution of WXXM Data in NAS Using OGC Data Access Services – Oliver Newell</li> </ul>

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## Agenda

Day 3 – September 1, 2011	
<b>08:00 – 9:00</b>	<b>Exhibits</b>
09:00 – 10:45	<b>Information Management (Split time in the Auditorium)</b> <ul style="list-style-type: none"> <li>• <i>Weather Sensor and Data Access Service Info Management Using ebXML Registry – Brett Levasseur</i></li> <li>• <i>Textual Weather Product Decoding – Aaron Braeckel</i></li> <li>• <i>Trade-Offs Involved When Representing Weather and/or Aviation Data in WXXM Formats (as Compared to Native Format) – Glen Pankow &amp; Chris MacDermaid</i></li> <li>• <i>Load Balancing in WXXM Systems – Tom Day</i></li> </ul>
<b>10:45 – 11:00</b>	<b>Coffee Break – Exhibits</b>
11:00 – 12:30	<b>Additional Application Services</b> <ul style="list-style-type: none"> <li>• <i>FAA/SAA Pilot Demo – Glen Landry &amp; Jim Perkins</i></li> <li>• <i>The NET: Dev./Mgmt. of Interagency Testbed – Pete Pickard</i></li> <li>• <i>Wrap-up: An Enterprise View – Pierre Truter</i></li> </ul>
<b>12:30 – 1:30</b>	<b>Lunch/Exhibits</b>
1:15 – 4:00	<ul style="list-style-type: none"> <li>• <i>AIXM CCB - Eddy Porosnicu</i></li> </ul>
<b>04:00 – 4:15</b>	<b>Conclusion – Deborah Cowell</b>

Day 3 – September 1, 2011	
<i>Breakout Sessions (held in the Science Center)</i>	
<b>08:00 – 9:00</b>	<b>Exhibits</b>
09:00 – 10:45	<b>Semantics</b> <ul style="list-style-type: none"> <li>• <i>Introduction to Semantics (1 hour) – Mark Kaplun</i></li> <li>• <i>Ontologies within Weather/Flight – Kajal Claypool &amp; Kelly Moran</i></li> </ul>
<b>10:45 – 11:00</b>	<b>Coffee Break – Exhibits</b>
11:00 – 12:30	<b>Additional WXXM</b> <ul style="list-style-type: none"> <li>• <i>Expansion of the WXXM Schema Model with the Inclusion of Probabilistic Weather Elements – Mark Oberfield</i></li> <li>• <i>WXXM Public Facing in a WXXM private Environment – Steve Olson</i></li> </ul>
<b>12:30 – 1:30</b>	<b>Lunch/Exhibits</b>

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## Session Abstracts

(listed in Session Order)

### Day 1, August 30, 2011

#### US/EU Coordination - Steve Bradford

The discussion is framed to provide an overview of international development in information management and coordination. In particular, the coordination and cooperation between the US and Europe will be the center theme. The discussion will encompass the role of the information management in NextGen and SESAR, its importance to interoperability, harmonization, and other areas. Issues such as the role of information management in stakeholder interaction and the harmonization of protocols, standards, and management will be covered. Lastly, the discussion will provide a summary of current efforts and outlook.

#### AIXM Status and Evolution - Eddy Porosnicu

The publication of the AIXM version 5.0 in March 2008 has set a milestone in the AIXM evolution, from a European AIS Database (EAD) focused specification towards a global digital AIM standard. The initial entity-relationship and custom XML Schema have been replaced by state-of-the-art technologies: UML model, GML schema and exhaustive "temporality" concept that provides Digital NOTAM capabilities.

On this baseline, AIXM version 5.1 released in February 2010 has brought some important updates: harmonisation of the "usage" models, properties with schedules, streamlined XML Schema, etc. While many AIM systems worldwide are still using the previous 4.5 version, the majority of the new AIS automation projects and upgrades are adopting the latest version 5.1.

After a period of significant change, there is now a need for stability. The objective for the further AIXM evolution is to minimise the amount of change in future versions, while also keeping the model in synchronisation with the evolution of the aeronautical information domain, in particular with new/changed ICAO requirements for aeronautical information publication.

The following topics will be presented and discussed during this session:

- AIXM 5.1 documentation (UML, XSD, Temporality, etc.)
- Support sites (www.aixm.aero, AIXM Wiki, AIXM Forum)
- On-going work (Data validation rules, Extensions, etc.)
- Current implementations
- Coordination with other data modelling activities
- Future versions (policy and planning)

#### WXXM Status and Evolution-Includes WXXM 2.0 and Beyond - Aaron Braeckel

WXXM 2.0 is a significant revision which includes major improvements and many fixes. The changes made in WXXM 2.0 and plans for subsequent versions will be discussed.

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### Flight Information Exchange Model (FIXM) - Rich Jehlen

Currently, the Federal Aviation Administration (FAA) along with the international community is working to develop an international flight information standard – The Flight Information Exchange Model (FIXM). FIXM is planned to be the international standard which is the basis for the Flight Object – a single common reference for the collection of all data elements that describe an individual flight. The Flight Object eXchange Service (FOXS) will be the mechanism for which the Flight Object's information is managed. In order to develop the three components of flight information exchange the FAA is harmonizing the FIXM standard across the globe with international partners that include, but are not limited to: Japan, Australia, Canada, South Africa, and Eurocontrol.

### AIXM Viewer - Glen Landry and Trent Tinker

AIXM5 is designed to convey aeronautical data between computer systems. The standard has been constructed to facilitate international communication of aeronautical information as the world moves towards a more open exchange of data. In order for AIXM 5 to be available for use and be adopted by a larger audience, it is important that users have the ability to view AIXM5 data presented to them.

Previously, there were no tools widely available to the FAA for the display of AIXM 5 graphical and attribute data. We present an AIXM Viewer tool that was developed specifically for the FAA, for the portrayal of AIXM 5 aeronautical data.

### Federal NOTAM System - NOTAM News/Demo - Shaelynn Hales

The Federal NOTAM System (FNS) is standardizing, digitizing and modernizing the collection, management, and distribution of temporary changes to aeronautical information within the National Airspace System. FNS leverages AIXM, OGC, and SWIM to provide a standard for the exchange of digital NOTAMs globally.

### MET Products enabled by WXXM - Dave Pace

The ultimate purpose of information exchange is to enable better decisions. In the case of WXXM, this is achieved by better conveying weather information, including information on the aviation constraints caused by weather, to aviation decision-makers and their decision support tools in a form which is readily and unambiguously applicable to problem resolution. The outcome is safer and more efficient aviation operations. This paper describes the information conveyed by WXXM and the concepts of use associated with it. It illustrates the concept with a scenario on weather constraint information being used to resolve an air traffic management (ATM) impact. It then shows the role of WXXM in enabling the ATM decision.

Outline:

1. Overall flow of weather information in the US National Airspace System
2. Concept of weather translation to constraints and conversion to impacts
3. Role of WXXM in the process
4. Example of information-driven aviation decision
5. Summary

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## Session Abstracts

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**Day 2, August 31, 2011**

### **Aeronautical Common Sense - Navin Vembar**

The Aeronautical Common Service (ACS) will be the single authoritative information source for aeronautical information. In order to develop the ACS, we must apply the appropriate web standards, data standards, and information management techniques to create a cohesive, useful service which can supply not just data, but information to decision support tools and human users. This talk will discuss what the capabilities of the ACS are and how it will be implemented.

### **NNEW/NextGen 4-D Weather Data Cube - Alfred Moosakhanian and Mark Miller**

The presentation will discuss plans and interagency cooperation for development and implementation of NOAA's NextGen 4-D Weather Data Cube and the FAA's NextGen Network Enabled Weather System. Working together these systems will provide users of the National Airspace System with a common source of weather information using net-centric technology and supporting standards for data, including Net CDF and WXXM. The Cube and NNEW will utilize existing agency communications backbones and Open Geospatial Consortium standards to enhance situational awareness across aviation users. Program objectives, a high-level architecture, timelines, and accomplishments will be briefed.

- The NextGen net-centric vision
- The 4-D Weather Data Cube/NNEW System
  - Users
  - Architecture
  - Services standards
  - Data format standards
  - Data/SAS
  - Schedules
  - Accomplishments

### **Flight Info Demo - Midori Tanino**

This presentation introduces the Flight Information Exchange Model (FIXM) and its relationship to the Flight Object (FO). It defines FIXM, and places it in the context of the NAS modernization effort, as well as other similar standards such as AIXM and WXXM. It introduces FIXM's overall goals, along with the FAA's development strategy and roadmap. Attendants are informed about data standardization efforts conducted so far, both from a data collection and from a data modeling standpoint. The presentation describes some of the engineering challenges faced in defining and implementing FIXM. The presentation also gives an overview of past FIXM-related demonstrations, and describes similar future efforts. To conclude, attendees are invited to actively participate in the development and implementation of FIXM.

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### **Digital Briefing Concepts - PIB - Eddy Porosnicu**

More than 20,000 NOTAM (on average) are in force at any moment world-wide. NOTAM messages that might concern a particular flight are provided to the crew in the form of Pre-flight Information Bulletin (PIB) which are frequently in the range of 20-50 pages. Such "NOTAM bulletins" increasingly fail to meet the end user needs, because of the limited filtering and usability capabilities of the current text NOTAM format.

Fully digital aeronautical and meteorological data will enable radical improvements in the pre-flight and in-flight briefing process. The challenge is to discover and document the rules for selecting, processing and presenting to the end user the right information, at the right time and in the right format. This is the objective of the SESAR "Digital Integrated Briefing" project, which will be highlighted in this presentation.

The following topics will be presented and discussed during this session:

- The current PIB concept and its drawbacks
- End user expectations for the future pre-flight briefing
- Digital Briefing research in SESAR

### **Using Systems Thinking in Developing WXXM-based System of Systems - Tom Day**

Data generated for weather information can come in a variety of formats and platforms. Because of the amount of science that is required for all of the systems and sub-systems to generate the forecast pieces, it is difficult if not impossible to require the source to reformat its output to meet a given standard. Although it is possible to require new systems to deliver output in a given standard or specified format, this is difficult if not impossible to accomplish for firmly established sources. This is especially true when a set of subscribers has historically received data in some given format, and new subscribers require the same information in a new or standardized format. This is the dilemma in providing weather data in WXXM-based formats suitable for more modern weather services. This discussion uses Systems Thinking in providing solutions to offering WXXM-based weather information and cause no-load on historic weather data sources using established System of Systems concepts.

### **A Developers Experience with SWIM - Panel Discussion**

The Panel discussion has been designed to give a high-level overview of service development and provision in the FAA through the System Wide Information Management (SWIM) Program. Various roles in developing services will be discussed by members of SWIM, Service Provider Organizations (Developers, Architects and Information Managers) and other supporting roles. These roles will be played out through a scenario, where panel members will review the steps necessary to respond to an information request. A discussion follows about what services are available and how they were developed in accordance to SWIM and other standards and guidelines.

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### **Highlights from the OGC OWS-8 Testbed Aviation Thread - Nadine Alameh**

This talk highlights preliminary outcomes of the Aviation thread of OGC's Web Service Phase 8 (OWS-8) testbed, a hands-on collaborative rapid prototyping initiative designed to continuously advance OGC's open interoperability framework for geospatial capabilities.

Sponsored by FAA, EUROCONTROL and NASA, the Aviation thread involves the participation of 18 competitively-selected OGC member organizations, collaborating on tasks such as maturing the use of WFS standard with AIXM data, exploring compression alternatives for AIXM, applying the SLD standard for encoding ICAO symbology for aeronautical features and advancing an event notification architecture to support the targeted delivery of Digital NOTAMs.

OWS-8 concludes with a demonstration on September 22, 2011 at the OGC Technical Committee meeting in Boulder, Colorado. Technical results will be captured in Engineering Reports that will soon be available on the OGC public site.

### **Efficient XML - Aaron Braeckel**

XML is well known for several traits: expressiveness, validatability, human-readability, and extensibility. These traits can come at the cost of compactness and efficiency, which can have non-trivial impacts upon bandwidth, latency, memory usage, and processing. This is particularly relevant with the data volumes encountered in the weather domain. The latest studies of efficient XML techniques, WXXM, and their impact on compactness and efficiency will be discussed.

### **Distribution of WXXM Data in the National Airspace System Using OGC Data Access Services - Oliver Newell**

This talk addresses the distribution of WXXM data in the National Airspace System using OGC services, including the Web Feature Service (WFS) and the Web Coverage Service (WCS). The utility of the standardized OGC spatial and temporal filtering functions as well as caching functions in a notional multi-tiered weather data distribution topology are discussed. The NextGen Network-Enabled Weather (NNEW) program's strategy of blending the 'traditional' OGC service interfaces with SWIM-compliant message broker implementations to satisfy real-time low-latency data delivery requirements is also presented, including initial performance metrics based on a software reference implementation.

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**Day 3, September 1, 2011**

### **Weather Sensor and Data Access Service Information Management using an ebXML Registry/Repository - Brett Levasseur**

The NextGen Network-Enabled Weather (NNEW) program utilizes a variety of metadata to describe sensors, available weather datasets, and data access service endpoints. The metadata standards, used are based on many of the same ISO/OGC data standards as AIXM and WXXM, resulting in a coherent overall metadata/data model.

This talk describes the use of an ebXML Registry Repository (RegRep) to provide governed access to weather-related metadata at runtime in support of the high-level system agility goals of NextGen. The use of a ISO 19139 ebXML profile to manage weather dataset and service metadata is discussed, as is the management of weather sensor metadata using an NNEW-developed ebXML RegRep SensorML profile.

Outline:

- NNEW Program metadata – Define the use of the ISO 19115, WSDL and SensorML standards and schemas in NNEW.
- Use of ebXML in NNEW – Discussion of how NNEW uses metadata and the capabilities of the registry to support easy access to weather information. This includes how weather data products are connected to their providing service and how geospatial metadata can be searched.
- Integration with SWIM NSRR – Information on the differences and advantages on the SWIM NSRR as a design time registry and the ebXML registry as a run time registry.
- Brief information on some future efforts.

### **Textual Weather Product Decoding - Aaron Braeckel**

In the aviation weather community there are a number of textual weather products that are commonly used, including METARs, TAFs, AIRMETs, and SIGMETs. These formats have been very successful over their history and are increasingly decoded using automated mechanisms by a variety of organizations. These formats are aimed towards human consumption, which creates a number of challenges for automated decoders. An overview of the decoding process and some of these challenges will be examined.

### **Trade-Offs Involved When Representing Weather and/or Aviation Data in WXXM Formats (as Compared to Native Format) - Glen Pankow and Chris MacDermaid**

Trade-offs involved when representing weather and/or aviation data in WXXM formats (as compared with its native format).

ESRL has been involved with preliminary efforts in converting certain meteorological data sets into WXXM. This talk will describe legacy data acquisition, translation, and distribution and contrast it with similar processing under an SOA-based system. In particular, our experience in handling METARs will be presented, and future directions will be discussed.

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### **Load Balancing in WXXM Systems - Tom Day**

The historic source systems producing weather information for processing is faced with new challenges in converting and disseminating their products in WXXM formats. Also, as new systems come on-line, the diversity of products, both WXXM and non-WXXM formats can cause undue loads and stresses on existing infrastructure. Even if the systems are sized properly for their infrastructure, it becomes difficult to maintain system balance for effective delivery by providing the same information in multiple formats. This discussion provides a practical and easy-to-use balancing algorithm for maintaining system balance, optimizing the infrastructure and economizing on new infrastructure purchases that can be applied in most WXXM and non-WXXM applications.

### **FAA/SAA Pilot Demo - Glen Landry and Jim Perkins**

The SAA Dissemination Pilot supported the automated dissemination and portrayal of Special Activity Airspace (SAA) information to users via Open Geospatial Consortium (OGC) Web Services. The Pilot focused on access, filtering, and portrayal of SAA information, as well as notifications of SAA updates and schedule changes to subscribed users. As such the objectives of the Pilot were three-fold:

1. Provide access to static and dynamic SAA information via OGC Web Services to increase the dissemination potential of SAA information to external users,
2. Expose SAA information services to the NAS stakeholders, particularly airlines, to support flight dispatch and planning,
3. Develop and exercise a standards-based Service-Oriented Architecture (SOA) that can accommodate future requirements related to automated scheduling and information synchronization with the DoD.

We will discuss lessons learned from the Pilot, and present highlights of the demonstration services.

### **AIXM CCB - Eddy Porosnicu**

This session will be dedicated to presenting the new AIXM Change Control Board approach, which aims at ensuring full transparency and global participation in the definition of the changes to be made in future AIXM versions. The concept of the new CCB was developed through the ICAO AIS-AIMSG, in relation with the work for the adoption of AIXM as ICAO Guidance Material. While Eurocontrol and FAA will continue to provide the resources for the maintenance of the model, a much more visible role in the definition and approval of the model changes will be given to the various stakeholder groups, in particular industry and world-wide AIS/AIM experts. The activity of the CCB is effectively initiated on this occasion.

The following topics will be presented and discussed during this session:

- Presentation of the proposed AIXM CCB process
- Demonstration of the AIXM CCB Web based tool (JIRA Hosted project)
- Open discussions about the proposed AIXM CCB process
- Planning of the AIXM CCB initiation phase: creation of user accounts, submission of first change proposals, establishment of the CCB supervision board, etc.

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## Session Abstracts

*(listed in Session Order)*

### **Expansion of WXXM Schema Model - Mark Oberfield**

The National Weather Service's Meteorological Development Laboratory (MDL) has created a system which generates hourly forecasts of aviation weather elements such as ceiling height, cloud coverage and horizontal surface visibility -- elements particularly difficult to obtain directly from numerical weather models. These forecasts are transformed into terminal aerodrome forecasts, i.e. TAFs, and disseminated using WXXM. However, TAFs convey a limited picture of the expected weather in the next 24 to 30 hours. To complete the forecast picture, probabilistic information from MDL's forecast system is added to the product. The presentation will describe MDL's forecast system in more detail, guidance TAF generation, and the implementation of probabilistic data in the North American weather extension (NAWX) to WXXM.

- \* Completing the forecast
- \* Description and performance of MDL's Local Aviation MOS Program
- \* Guidance TAF generation
- \* Changes to NAWX schema to include probabilistic information
- \* Current implementation and future plans

### **WXXM Public Facing in a WXXM Private Environment - Steve Olson**

In 2004, NOAA's National Weather Service (NWS) created a Digital Services Program to meet our customers' and partners' ever increasing need for digital weather, water, and climate services. The foundation of this program is the National Digital Forecast Database (NDFD). NDFD is a set of gridded forecasts of sensible weather elements. It contains a mosaic of digital forecasts from NWS field offices working in collaboration with the National Centers for Environmental Prediction (NCEP). A companion to NDFD is the National Digital Guidance Database (NDGD) which contains guidance forecasts in gridded formats that are interoperable with NDFD.

NDFD and NDGD offer an unprecedented opportunity for the NWS to automate, modernize, and improve products and services to meet the evolving needs of our customers and partners. Currently, users can download forecast grids that are encoded in the WMO's FM-92 GRIB Edition 2 (GRIB2). Customers and partners can also access NDFD/NDGD data that have been formatted in an NWS-specific dialect of XML via a web service that supports Simple Object Access Protocol (SOAP).

The current suite of services, however, cannot support emerging standards for the machine-to-machine exchange of geospatial data. The Federal Aviation Administration's (FAA) Next Generation (NextGen) Network Enabled Weather program has developed technologies that can be used to integrate NDFD, NDGD, and a number of other weather data sources into a 4-D Weather Data Cube. The 4-D Weather Data Cube is a net-centric, four-dimensional (three spatial dimensions plus time) virtual database of weather information. Access to 4-D Weather Cube Data is a two-step process. The first step is to query the Registry/Repository (RegRep) service metadata for the service and endpoint as part of data discovery. The second step is to use the endpoint and service described in the RegRep metadata for data retrieval.

The NWS's Meteorological Development Laboratory (MDL) is currently hosting RegRep, Web Coverage (WCS) and Web Feature (WFS) Services. A number of tools and mechanisms are used to implement the RegRep, WFS and WCS, including XML encoding schemes like Weather Information Exchange Model (WXXM), transport protocols to exchange data with clients, and binary data formats. To date, MDL has been providing these services exclusively to the FAA on a private network. MDL is planning to leverage this work, and is developing a plan to offer similar types of services for machine to machine exchange of geospatial data with the general public.

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## Speaker Biographies

(listed in Alphabetical Order)

### Dr. Nadine Alameh

Dr. Alameh is Director of Interoperability Programs at OGC, planning and managing multi-vendor software prototyping and pilot initiatives to advance geoinformatics-related requirements and specifications. Dr. Alameh is a leader in the field of geospatial interoperability with a proven track record in architecting and implementing geospatial technologies, standards and web services. Her current engagements include leading diverse international teams of participants and sponsors in applying OGC and other web standards for providing up-to-date aeronautical and weather information to pilots, aircrafts and other users of such on-demand real-time information. Dr. Alameh is also leading Global Earth Observing System of Systems (GEOSS) Architecture Implementation Pilots (AIP) activities, focusing on supporting the earth observation community in developing and deploying new process and infrastructure components for the GEOSS Common Infrastructure. Dr. Alameh holds two MS. degrees and a Ph.D. from MIT in the field of Information Systems Engineering.



### Paul Bosman

Mr. Paul Bosman worked 7 years as Technical Project Manager on Surveillance Analysis products in Eurocontrol's R&D Centre in Bretigny. He joined the Eurocontrol Aeronautical Information Management Domain in 2000 where he worked on AIS improvement projects such as ISO9000, AIRAC Adherence & SLAs and created AIS Agora.

He then moved on to work as Special Advisor to the Director ATM Programmes and was seconded to the SESAR Definition phase Content Integration Team where his responsibilities concentrated on the production of the Masterplan and associated Work Programme.

Back with AIM since 2008, he is now the SWIM/EA Unit Manager, chairman of the European AI-Team & ICAO AISAIM Study Group and Agency focal point for AIM.



### Steve Bradford

Steve Bradford is the Chief Scientist for Architecture and NextGen Development in the FAA's Air Traffic Organization NextGen and Operations Planning Service Unit. In this role he has participated in the development of the Joint Planning and Development Office's (JPDO) NextGen Concept, the RTCA NAS Operational Concept and the ICAO ATMCP Global Concept. He is Chairmen of the Technical Review Board of the Air Traffic Operations which monitors technical decisions related investments and the Enterprise Architecture. He also works with elements of the FAA and the JPDO to develop midterm plans and five year budget requests to implement NEXTGEN. He has a leading role in several new activities with SESAR Joint Undertaking, and has led several co-operative international efforts via action plans with Eurocontrol. Previous activities include leading efforts to validate future concepts and developing the FAA's NAS Enterprise Architecture. Prior to his current position, Mr. Bradford was the Manager of the NAS Concept Development Branch and conducted early analysis of Free Flight Concepts.



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## Speaker Biographies

*(listed in Alphabetical Order)*

### Aaron Braeckel

Aaron Braeckel is a software engineer with the National Center for Atmospheric Research. Aaron began his work at NCAR on the Aviation Digital Data Service (ADDS), a pilot service for aviation weather visualization and data services. Recent work has included the development of weather data dissemination systems and WXXM data modeling as part of the FAA NextGen modernization effort.

### Gary Church

Gary Church is the President of Aviation Management Associates, Inc. which was founded in 1984. He is an active licensed instrument rated pilot, former air traffic controller with the Federal Aviation Administration, and past Manager of Air Traffic Control for the Air Transport Association. Among his many aviation activities, Mr. Church is an active professional member of the Air Traffic Control Association and has Chaired ATCA's Annual Symposium four times in the last 25 years. He is also a member of EAA, AIAA, AOPA and the Aero Club of Washington where he was Membership Chair and Trustee. Further, Mr. Church has served as the Chairperson of Airway Science Research Advisory Council of Embry-Riddle Aeronautical University. Gary majored in physics and minored in economics at the University of California, Berkeley and Indiana University, Bloomington.



### Thomas Day

Thomas J. Day, Ph.D. is the Chief Engineer for the NOAA NextGen Weather Program. He is also Analysis Branch Chief for the Systems Engineering Center, Office of Science and Technology at the National Weather Service. He currently has over 45 technical papers and publications, including peer-reviewed research and two textbooks in the field of applied systems engineering.



### Shaelynn Hales

Shaelynn Hales, an Associate Director with the Air Traffic Management Division of CNA, has supported the FAA Aeronautical Information Management Group since 2003. Most recently, she has supported the Federal NOTAM System project as the Technical Lead, leading to the development of capabilities to support the Digital NOTAM concept.



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## Speaker Biographies

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### Mr. Michael Hohm

Michael Hohm has been involved in Aviation for over 35 years. First licensed as a pilot in 1973, he has worked as a civil pilot in various roles accumulating approximately 6000 hours. In 1988 he joined Transport Canada as a Civil Aviation Inspector doing flight procedure and airspace design work. In 1991 he assumed the position as Supervisor of Aerodrome Policy and Standards developing the design and certification standards for Canadian Airports as well as participating in the development of the *Canadian Aviation Regulations*. He joined NAV CANADA at its inception in 1996 taking on the responsibility for airspace design and later becoming the Manager of the branch responsible for AIS, NOTAM and Airspace/Flight Procedures. Eventually focusing on airspace design, his familiarity with operational requirements and infrastructure development in the ANS was employed to develop the NAV CANADA AIS Strategic Plan outlining the move from a publication centered AIS to an information management focus. He participated on the ICAO ATMCP/ATRRPP since its beginning as the Canadian member and has previously participated on the ICAO Visual Aids Panel, the All-Weather Operations Panel, and the Obstacle Clearance panel. Michael Hohm joined ICAO in September 2009 as the Technical office responsible for AIS issues with particular emphasis on the transition from AIS to AIM.



### Richard Jehlen

Currently the Director of the Planning & Performance Office in the Air Traffic Organization's System Operations Services and serves as the Air Traffic Procedures Advisory Committee (ATPAC) Executive Director. Mr. Jehlen holds a Bachelor of Science degree from Excelsior College and has over 30 years Air Traffic Management experience. His operational experience, both FAA and Department of Defense, includes positions in the Tower, Approach Control and Air Route Traffic Control Center.

During his career, his responsibilities have included: Automation, Airspace & Procedures, Traffic Flow Management, Future Concepts, Validation and Integration, Operational Planning and Requirements. Mr. Jehlen has also served as the United States' representative to ICAO (Panel/Study Group) and currently is the U.S. Panel Member to the ICAO Air Traffic Management Requirements and Performance Panel (ATMRPP).



### Glen Landry

Glen Landry works at CNA in Washington D.C. He has been supporting the FAA Aeronautical Information Management group for five years. In that time he has worked on the Sector Design and Analysis Tool (SDAT), the Special Activity Airspace modernization, and the National Offload Program Repository. Glen has a Ph.D. in Physics from the University of Delaware.



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## Speaker Biographies

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### **Brett Levasseur**

Bachelors of Science in Computer Science  
Worcester Polytechnic Institute Class of 2008  
Massachusetts Institute of Technology Lincoln Laboratory 2008 - Present  
Technical Interests - Systems/Networks



### **Chris MacDermaid**

Chris became a CIRA associate in 2001 and currently works as a senior research associate for NOAA's Earth System Research Laboratory (ESRL) in the Global Systems Division (GSD) as lead of the Data Systems Group (DSG). His areas of expertise include meteorological data acquisition and data dissemination.

Most recently, Chris has been working as technical coordinator for NOAA/OAR/ESRL/GSD's involvement with the FAA's NNEW (NextGen Network Enabled Weather) program and the NWS's NextGen program.

Chris MacDermaid earned his B.S. in Computer Science and Mathematics from the Colorado State University in 1994. Following graduation, Chris worked as a consultant at Interleaf and as a software developer at Spatial Technologies.



### **Mark Miller**

Mark Miller is the Program Manager for the NOAA NextGen Weather Program in NOAA's National Weather Service, Office of Science and Technology in Silver Spring, Maryland. In this capacity, he is responsible for the execution of NOAA's development for more accessible and more accurate weather information for the Next Generation Air Transportation System (NextGen) initiative. He entered government civil service in October 2006 after serving 20 years in the Air Force, retiring at the rank of Lieutenant Colonel.

Before coming to NOAA in September 2009, Mr. Miller was the Chief Meteorologist for the Headquarters, Department of the Army, Office of the Deputy Chief of Staff for Intelligence. He was responsible for Army weather policies and requirements validation to meet the Army's weather and environmental support requirements.

During his military career, Mr. Miller was a Distinguished Graduate from the Reserve Officer's Training Corps and was commissioned in 1986. He served in various weather support positions to the Air Force in Virginia, Alaska, and Nebraska. In 1997, Mr. Miller was placed in charge of weather operations for the Global Weather Division at the Air Force Weather Agency, Offutt AFB, Nebraska, where he oversaw all worldwide severe, aviation hazards, and tropical forecast production. He was then reassigned as Chief of the Special Support Operations Branch, providing weather support and services for special operations and intelligence missions.

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### **Alfred Moosakhanian**

Alfred is currently the Aviation Weather Services Dissemination Manager in the Technical Operations Weather Organization. He is a PMP and FAA Senior Level Certified Program Manager that currently manages NextGen Network Network Enabled Weather (NNEW), Weather and Radar Processor (WARP), Next Generation Weather Radar (NEXRAD), and Juneau Airport Wind system (JAWS).

Previously, he served as the En-route Weather programs manager that included FIS Data Link (FISDL), Corridor Integrated Weather System (CIWS), and WARP. He has 30 years of engineering and management experience in the Industry and FAA working on numerous programs involving advanced Communications, Weather, and Automation technologies, from concepts to full scale development and system operation. Alfred has MS in Electrical Engineering, MS in Engineering Management, and BS in Electrical Engineering.

### **Oliver Newell**

Mr. Newell is a member of the technical staff. He received a B.S. in Civil Engineering from the University of Massachusetts in 1984. He worked at the MIT Earth Science Department on weather radar systems prior to joining the Laboratory in 1988. His early work focused on building real-time signal processing systems for the ASR-9 Weather Systems Processor and Terminal Doppler Weather Radar systems. Subsequent work included design and implementation of enhanced real-time processing subsystems for the ASR-9 and Mode-S surveillance radar systems. He is now working on net-centric system architectures in the context of a number of FAA and DOD programs.



### **Mark Oberfield**

Mark Oberfield is a meteorologist with the National Weather Service's (NWS) Meteorological Development Laboratory (MDL). His career started at the NWS Warning and Forecast Office (WFO) in Birmingham, AL, learning the roles and responsibilities of the forecaster. After nearly three years at the WFO, he joined MDL in developing computer applications to assist WFO forecasters in their duties. He was the task-leader in the development of one of the most widely used applications within the NWS to assist forecasters in composing and monitoring terminal aerodrome forecasts against real-time observations. Currently, he is working on the production of gridded and point guidance for NextGen's 4-D Weather Data Cube.



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### Steve Olson

NWS employee Steve Olson works with the Meteorological Development Lab in the NWS's Office of Science and Technology. He holds a B. A. degree in Mathematics from St. Olaf College and a M.S. degree in Meteorology from Florida State University. Steve has been with the Federal Government for 5 years. Steve now lives in Laurel, Maryland.



### David Pace

David Pace is a meteorologist in the FAA Aviation Weather Group. His responsibilities concern weather in the Next Generation Air Transportation System (NextGen) and in particular the integration of weather into Air Traffic Management decisions. Other duties include interfacing with weather efforts in EUROCONTROL, membership on the Joint Planning and Development Office Weather Working Group Executive Panel, and Chairmanship of the American Meteorological Society Committee on Aviation, Range, and Aerospace Meteorology. In his 20-year association with FAA weather programs, Mr. Pace worked extensively on the FAA Aviation Weather Research Program and the management of weather research at various national laboratories. He is also a retired US Air Force weather officer.



### Glen Pankow

Glen has been with NOAA's Earth System Research Laboratory in the Global Systems Division for over two decades as a senior software engineer, much of that time under contract with CIRA. He has extensive experience with data acquisition, translation, dissemination, and long-term storage.

Most recently Glen, has been working to serve meteorological data sets using UCAR's WCSRI and MIT's WFSRI for ESRL/GSD's involvement with the FAA's NNEW program and the NWS's NextGen program.

Glen earned a B.A. in Chemistry in 1981 and an M.S. in Computer Science in 1987, both from the University of Colorado at Boulder. He has worked for the University as well as for NOAA.



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## Speaker Biographies

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### Jim Perkins

Jim Perkins is the lead for Special Activity Airspace automation in the Aeronautical Information Management directorate at FAA Headquarters in Washington, DC. He has over 25 years experience as an Air Traffic Controller, with the last nine years at FAA Headquarters. He has been involved with Special Activity Airspace automation for the past seven years, beginning as a subject matter expert and moving up to program management. Jim has a Bachelors degree in Biology from Drake University.



### Eduard Porosnicu

Eduard Porosnicu studied at the University "Politehnica" in Bucharest where he has been graduated Aircraft Engineer. After a short training in procedure design and aeronautical information, he started working for the Civil Aviation Authority of Romania, AIS and Navigation Department.



He works in EUROCONTROL since 1998 in the Aeronautical Information Management area. Eduard's responsibilities include the development of automation specifications, in particular the Aeronautical Information Exchange Model (AIXM), Electronic AIP (eAIP) and Digital NOTAM. Currently, he is also leading the Eurocontrol contribution to the "AIM Sub-system" work package of SESAR, which includes the Digital Integrated Briefing project.

### Midori Tanino

Midori Tanino joined the FAA's Flight Object (FO) team as a manager in 2009. She leads the development and establishment of Flight Information Exchange Model (FIXM). She also leads FO demonstration and engineering analysis activities. She is an expert in the field of Traffic Flow Management (TFM) and has successfully developed and deployed multiple TFM decision support tools and algorithms. Midori has BS/MS in CS/Mathematics/EE from University of Maryland, Collage Park.



### Trent Tinker

Trent Tinker works at Luciad, Inc. in Reston, VA. He has an extensive background in GIS application development. For the past 7 years, he has developed GIS applications for a variety of government agencies. Additionally, he has taught GIS classes and provided on-site support to customers. The AIXM5 Viewer was developed by Luciad and Trent will support the FAA in the launch and distribution of the AIXM5 Viewer.



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### Ahmad Usmani

Since 2007, Ahmad Usmani has been the program manager for the System Wide Information Management (SWIM) Program Office at the Federal Aviation Administration (FAA). SWIM is a National Airspace System (NAS)-wide information system that supports Next Generation Air Transportation System (NextGen) goals. SWIM is a technology enabler that provides the Information Technology (IT) infrastructure necessary for NAS systems to share information, increase interoperability, and encourage reusability of information and services.



Previously, Ahmad wrote code for the Global Positioning System (GPS) and worked on the Advanced Automation System (AAS) for IBM. After a brief leave of absence to attend graduate school and a return to IBM for a couple of years, Ahmad joined Computer Technology Associates as an operations engineer overseeing the Computer-Human Interface (CHI) of FAA's Voice Switching and Control System (VSCS). He supported VSCS through Operational Test and Evaluation (OT&E) and Initial Operating Capability (IOC) deployment. Ahmad then worked with the CHI team on the Display System Replacement (DSR). He supported other government agencies before becoming a FAA federal employee in 2002, as a Systems Engineer and Investment Analyst for the Traffic Flow Management (TFM) Program Office and later in supporting the SWIM Program.

Ahmad holds Bachelor's degrees in Computer Science and Applied Math from Northwestern University and a Master's degree in Industrial Engineering from the University of California at Berkeley.

For more information on the SWIM Program, please visit [www.swim.gov](http://www.swim.gov) or email SWIM at 9-ATOW-HQ-SWIM@faa.gov.

### Navin Vembar

Dr. Navin Vembar is the Acquisition Lead for the AIM Modernization Program for the FAA. The programs under AIM Modernization will create the Federal NOTAM System and the Aeronautical Common Service. He has been working for the FAA as for the last two years, and prior to that was an engineer for the agency for 5 years. He has a Ph.D. in Mathematics from University of North Carolina-Chapel Hill.

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## Featured Exhibitors

### Avitech AG

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### Carroll Publishing

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*CGH is a US-based woman-owned company, with 20+ year background covering the entire realm of AIM system engineering including SW development/deployment, AIXM data exchange, international standards compliance, quality control/assurance, enterprise architecture, information security, system acceptance testing, configuration and project/program management.*

### CNA

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*CNA is a non-profit research and analysis organization providing objective analyses to the Federal Aviation Administration since 1992. CNA provides a range of technical and analytical expertise including: operations analysis, systems engineering, investment analysis, modeling simulation and optimization, business process and quality management.*

### CommVault Systems

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*CommVaultr Simpanar software modules were designed to work together seamlessly from the ground up, sharing a single code and common function set, to deliver superlative Backup & Recovery, Archive, Replication, Search and Resource Management capabilities.*

### Dell, Inc.

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### Esri

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*Esri, the leader in geographic information systems (GIS), provides the technology advantage for civilian and military organizations worldwide. Esri's solutions and its technology platform provide the business advantage and exploitation capabilities that defense agencies and aviation authorities require for modernizing their system architectures.*

### FAA Aeronautical Information Management

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*Enterprise Architecture*

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## Featured Exhibitors

### FAA NextGen Network Enabled Weather

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Alfred Moosakhanian  
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### Frequentis USA, Inc.

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*The core business of Frequentis are highly-available communication and information solutions for the civil air traffic management market. smartAIM, the smart aeronautical information management solution, is used by CAAs, ANSPs and military organisations around the world to manage aeronautical static and dynamic information.*

### Fusion-io

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*Fusion-io is the leading provider of application-centric, enterprise storage architecture that unlocks a world of possibilities for performance-starved applications. The company is closing the gap between processing power and storage needs by delivering breakthrough performance at a fraction of the cost of traditional disk-based storage systems.*

### IDS- Ingegneria Dei Sistemi SpA

Stefania Petrini  
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*IDS is an independent system engineering company operating in both defence and civilian fields. IDS has been providing high technology engineering consultancy and integrated software and hardware system solutions since it was founded in 1980. The company is organised into four business lines: Naval, Aeronautical, Airnavigation, Georadar.*

### Infoblox

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*Infoblox is the leader in network automation and control. Many of the world's largest businesses rely on our integrated hardened appliance based software for business continuity, availability and compliance. We provide integrated DNS, DHCP, IP Address Management (IPAM) and Network Change & Configuration Management (NCCM) products.*

### Luciad Inc.

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*Luciad provides software solutions for high performance data fusion, visualization, and analysis of geospatial information. Luciad's software components are the building blocks for mission-critical ATC/ATM and C4ISR systems. For more info please visit [www.luciad.com](http://www.luciad.com) or contact us at [Info@luciad.com](mailto:Info@luciad.com).*

### NOAA NextGen Weather

Tamarah Russell  
1325 East West Highway  
Silver Spring, MD 20910  
(301) 713-0763 Ext. 182  
Thomas.Day@noaa.gov

*Interactive demonstration of NOAA NextGen Weather Initiative as pretains to WXXM translation and dissemination*

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## Featured Exhibitors

### Open Geospatial Consortium, Inc.® (OGC)

Nadine Alameh, Ph.D.  
8070 Georgia Ave #304  
Silver Spring, MD 20910  
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nalameh@opengeospatial.org  
<http://www.opengeospatial.org>

*The Open Geospatial Consortium (OGC) is a non-profit, international, voluntary consensus standards organization leading the development, promotion and harmonization of standards for geographic content and services, sensor webs, and location services. The OGC has been assisting in the evaluation, advancement and adoption of AIXM and WXXM by leading a series of rapid prototyping initiatives focused on these emerging standards.*

### Palo Alto Networks

Patrick Gleason  
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<http://www.paloaltonetworks.com>

*Palo Alto Networks offers innovative, next generation firewalls that provide IT organizations with visibility and control of all applications, users, and content on the network.*

### SAP Government at Carahsoft

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### Snowflake Software

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*Snowflake Software, the Data Exchange Company, is a leading provider of solutions and expertise to enable interoperable data exchange based on open standards. Active in the Air Traffic Management (ATM) market since 2008, Snowflake has built its reputation through playing a lead role in the FAA / EUROCONTROL sponsored Open Geospatial Consortium (OGC) Open Web Services (OWS) testbeds.*

### Teradata Corporation

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*As the global leader in data warehousing and analytic technologies, Teradata provides government agencies an integrated view of their agency's data to make better, faster decisions. Teradata elevates enterprise intelligence by giving every decision maker the insight necessary for responding to critical tactical and strategic decisions.*

### UCAR

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*The National Center for Atmospheric Research advances atmospheric science in service to society. Current developments related to aviation include: aircraft icing and de-icing, storm forecasting, atmospheric turbulence, ceiling and visibility, oceanic weather, and NextGen Network Enabled Weather technology. The FAA and MIT/LL are partners in NNEW.*

# Air Transportation Information Exchange Conference - (featuring AIXM, WXXM and FIXM)

*"Enabling Information Sharing thru Common Services"*



Federal Aviation  
Administration



## Notes

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