Update on AirNow, AQS, and OAQPS IT Transitions

AAPCA Fall Meeting
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System Alignment in the OAQPS IT Center

Vision

- Align all major OAQPS IT systems within the Outreach and Information Division (OID) by functional business lines to accommodate:
  - Future consolidation.
  - Streamlining
  - Enhance the capabilities of OAQPS IT systems

Timeline

Alignment	Transition	Streamline
(2021)	(2021-2023)	(2022-TBD)

Ambient Systems Transition to the Information Transfer Group (ITG)

- All ambient systems aligned in the Information Transfer Group (ITG) on January 2, 2022. Temporary details through July 2, 2022, to help with transition and knowledge transfer

- Ambient LEAN events completed in January 2022; included regional participation.

- Knowledge Transfer - Complete knowledge transfer in Fall 2022.

- Requirements Gathering underway for a single ambient process and system
  - Responding to the GAO reports (GAO-21-38, Air Pollution: Opportunities to Better Sustain and Modernize the National Air Quality Monitoring System, 102657) and Effects of Wildfires on Air Quality and Public Health (Engagement Code 104723) that stated the ambient systems need to be modernized.
  - Follow up to the LEAN events and will include our EPA regional partners.

- Requirements Analysis Timeframe – Summer to Winter 2022/Spring 2023.

ITG Members and Roles

John White

AirNow System Manager

Rob Wildermann

AirNow Web Product Owner / Quality Manager

Samson Onyango

AirNow API Developer

Josh Drukenbrod

WebCMS Team, AirNow / AQS User Support

Tami Laplante

AQS/ AirNow User Support, AQS Content Manager, Contractor Support

Robert Coats

AQS Product Owner, System Manager, AQS Developer

Brad Johns

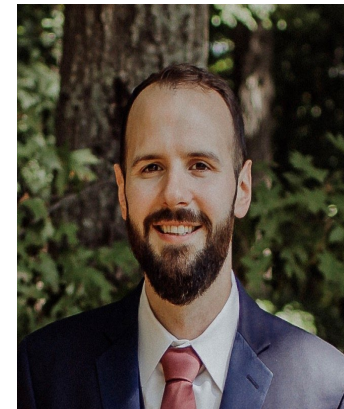AQS DataMart, Security, Developer

Phil Dickerson

Group Leader

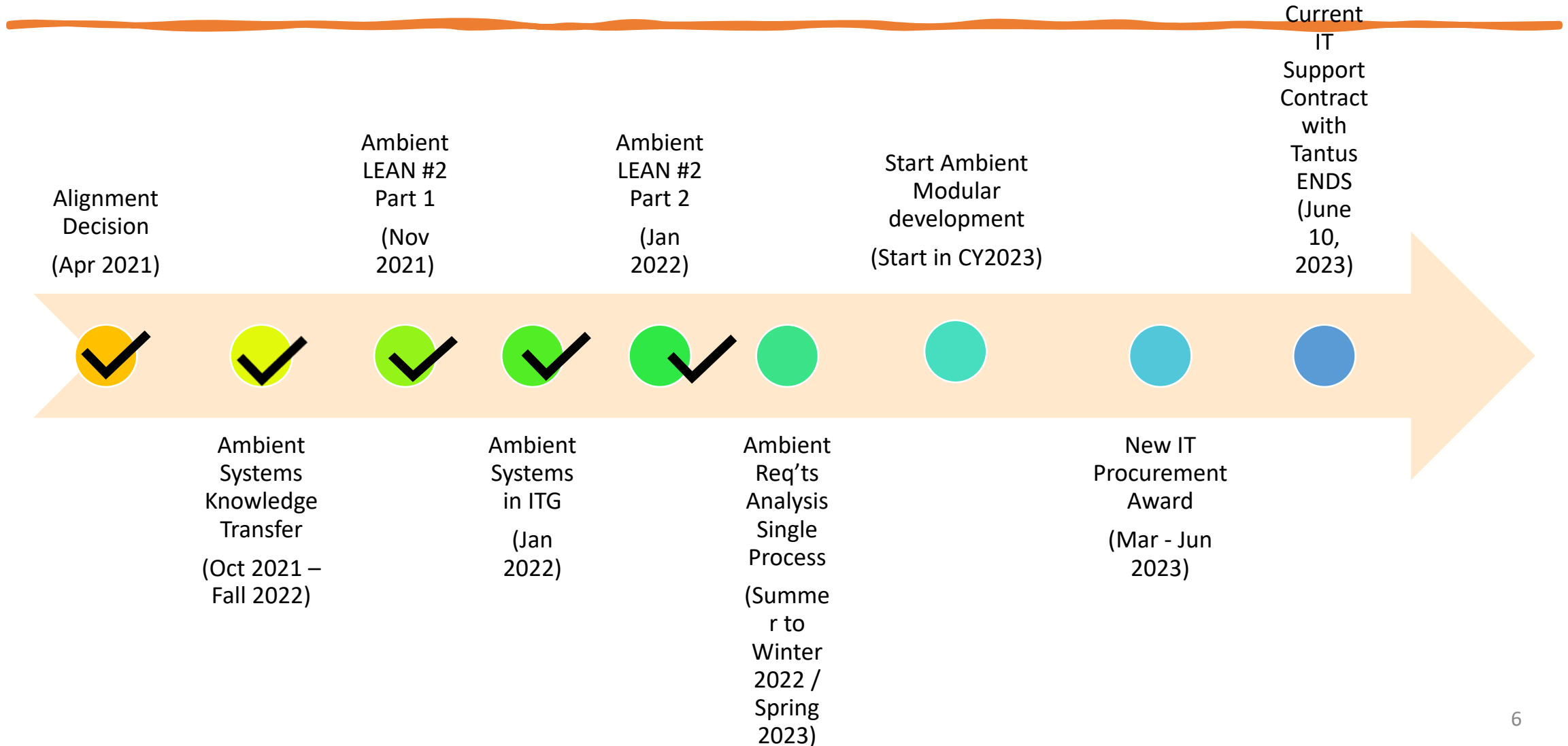**Eric Bettes**

AirNow/ AQS Security Officer

Luke Kaufman

AQS Developer

Mike Matosky

AQS Developer

Ambient Systems Transition Timeline

Alignment Decision (Apr 2021)

Ambient LEAN #2 Part 1 (Nov 2021)

Ambient LEAN #2 Part 2 (Jan 2022)

Start Ambient Modular development (Start in CY2023)

Current IT Support Contract with Tantus ENDS (June 10, 2023)

Ambient Systems Knowledge Transfer (Oct 2021 – Fall 2022)

Ambient Systems in ITG (Jan 2022)

Ambient Req'ts Analysis Single Process (Summer to Winter 2022 / Spring 2023)

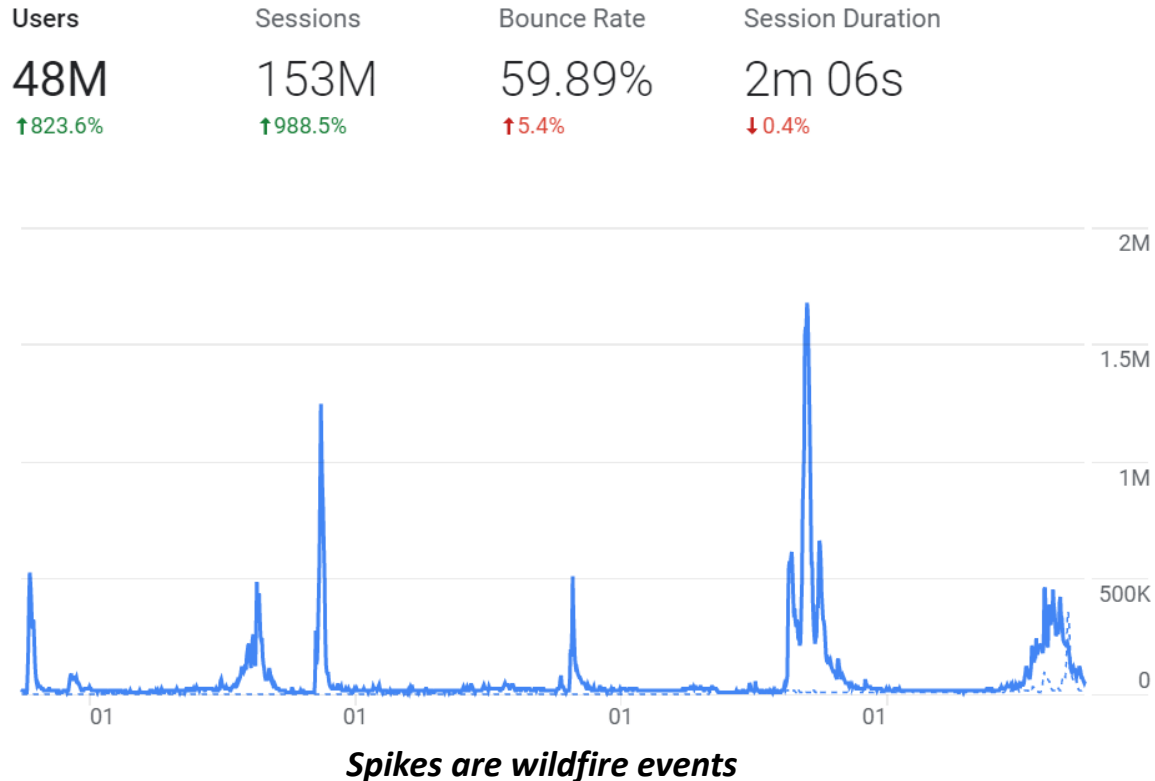New IT Procurement Award (Mar - Jun 2023)

AQS Updates

- Transition
  - New staff
- Login.gov support
- Will focus on maintenance while gathering requirements for a single system

AirNow Updates

- Wildfires and AirNow

- The AirNow app

- Fire and Smoke Map

Wildfires and the AirNow Program

Website traffic (2017-2021)

Users	Sessions	Bounce Rate	Session Duration
48M	153M	59.89%	2m 06s
↑823.6%	↑988.5%	↑5.4%	↓0.4%

Spikes are wildfire events

- **The public relies heavily upon AirNow as a source of information, especially during wildfires**

- **During wildfire events, AirNow usage is often 100 times that of an average day**

- **Major improvements to help the public protect their health**
  - ✓ Website infrastructure on cloud.gov to handle increased traffic
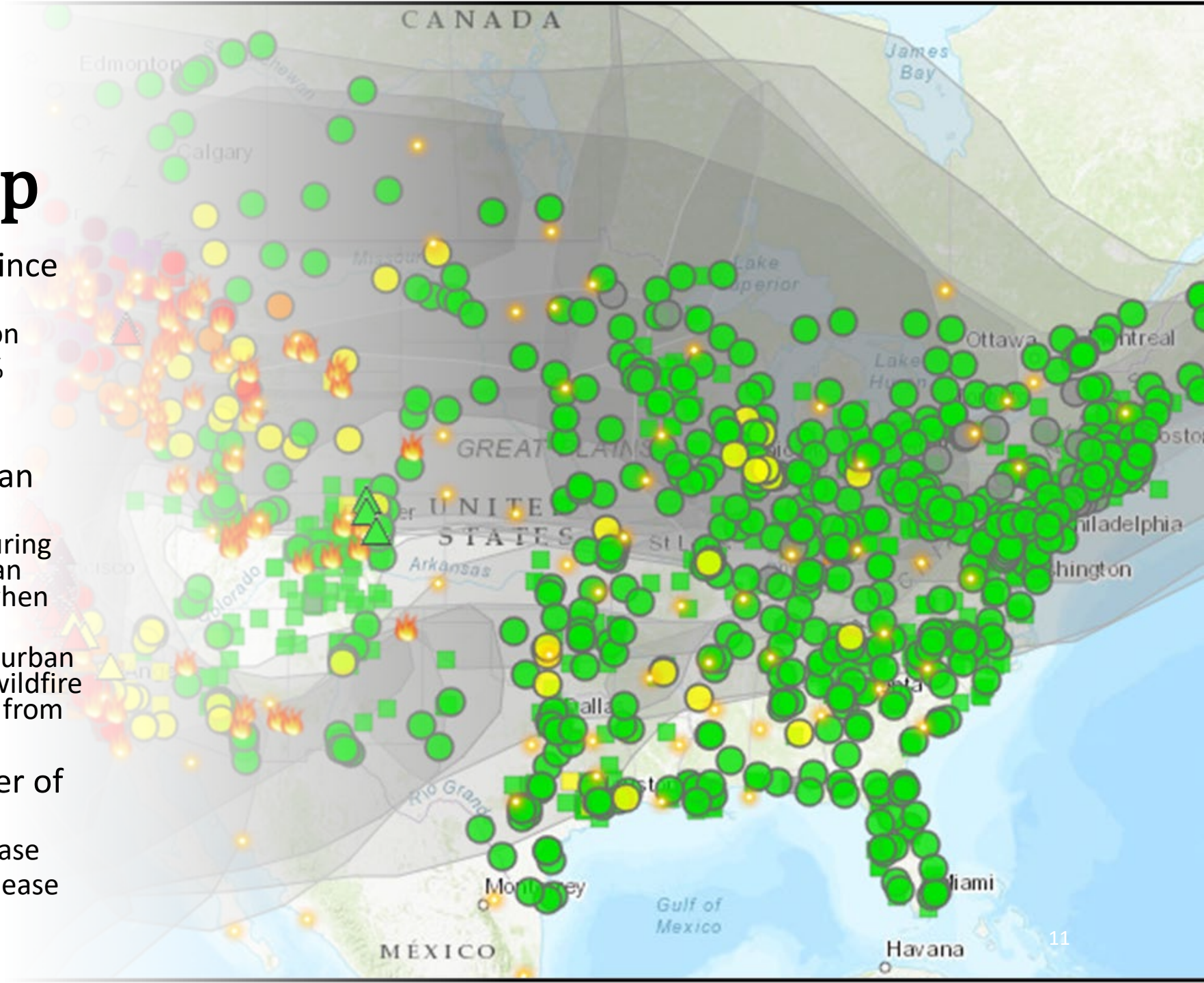
AirNow: Fire and Smoke Map

- Over 28 million page views since initial release
  - 7.5 million in 2020 fire season
  - Over 13 million in 2021, 10% viewed on AirNow app
  - Over 400,000 on one day
- Definite tie to wildfire in urban areas
  - Many significant wildfires during Fall 2021 were not near urban areas so usage not as high when wildfires near urban areas
  - Heavy use when wildfires in urban areas, during January 2022 wildfire in Colorado usage increased from 2,000 to 58,000 in a day
- Significant increase in number of sensors
  - Roughly 7,500 for initial release
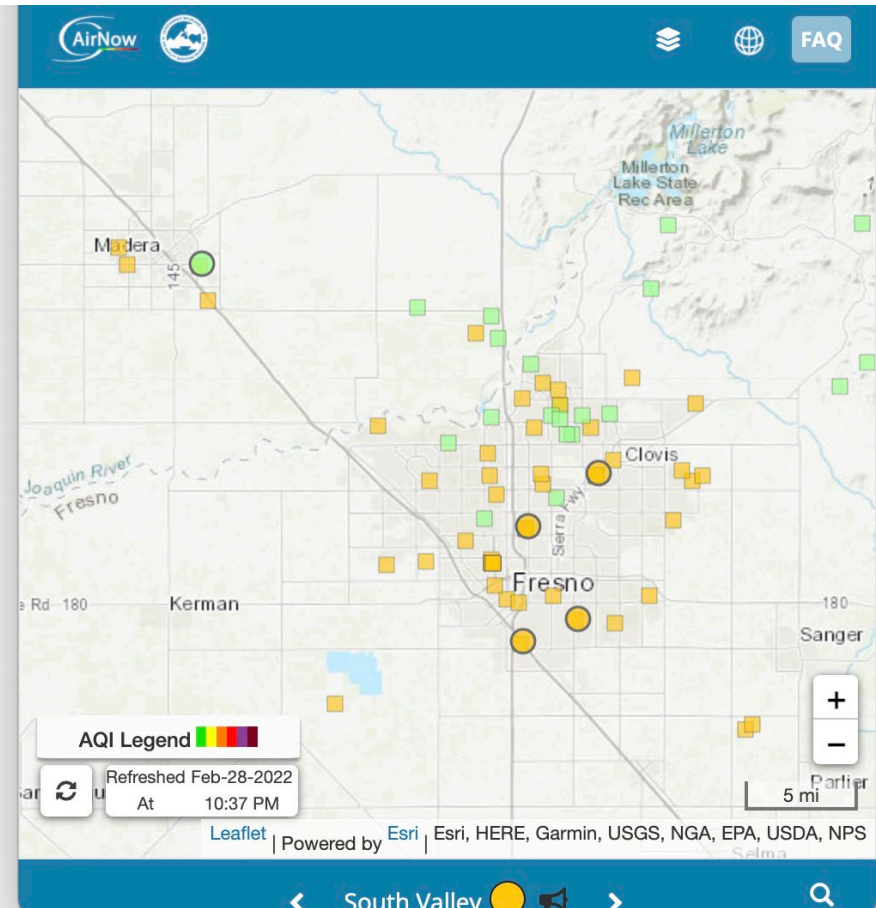 - Over 13,000 for version 3 release

Fire and Smoke Map: Color vision deficiency AQI accommodation

Traditional AQI colors

Adjusted AQI colors
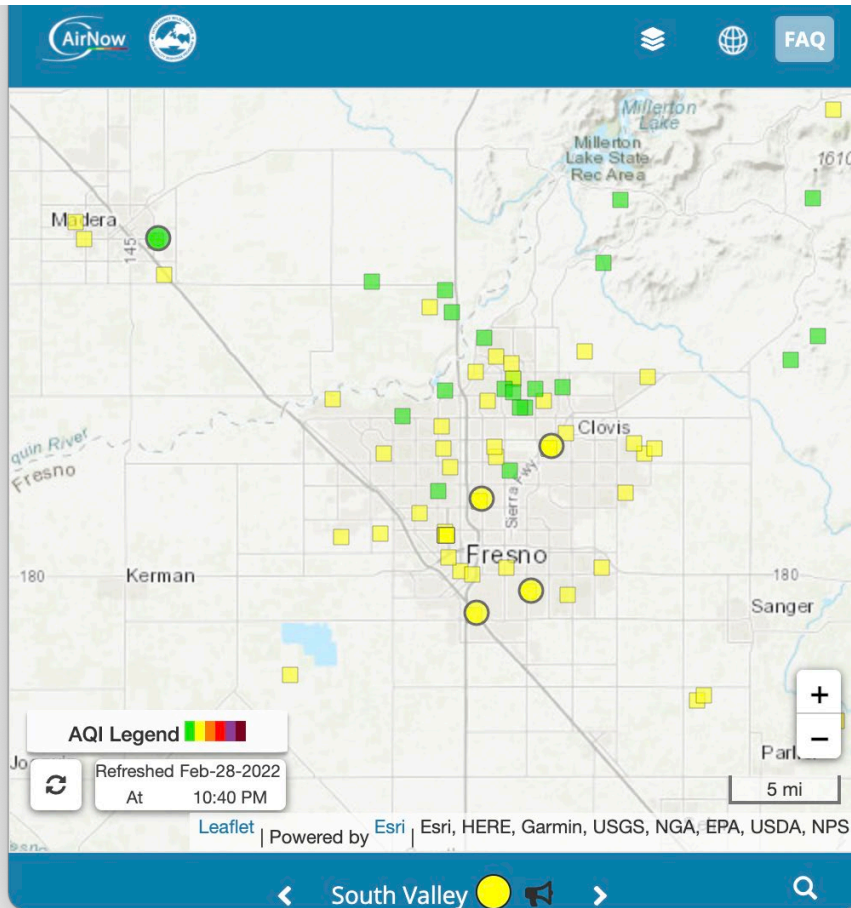
AirNow Resources in Spanish
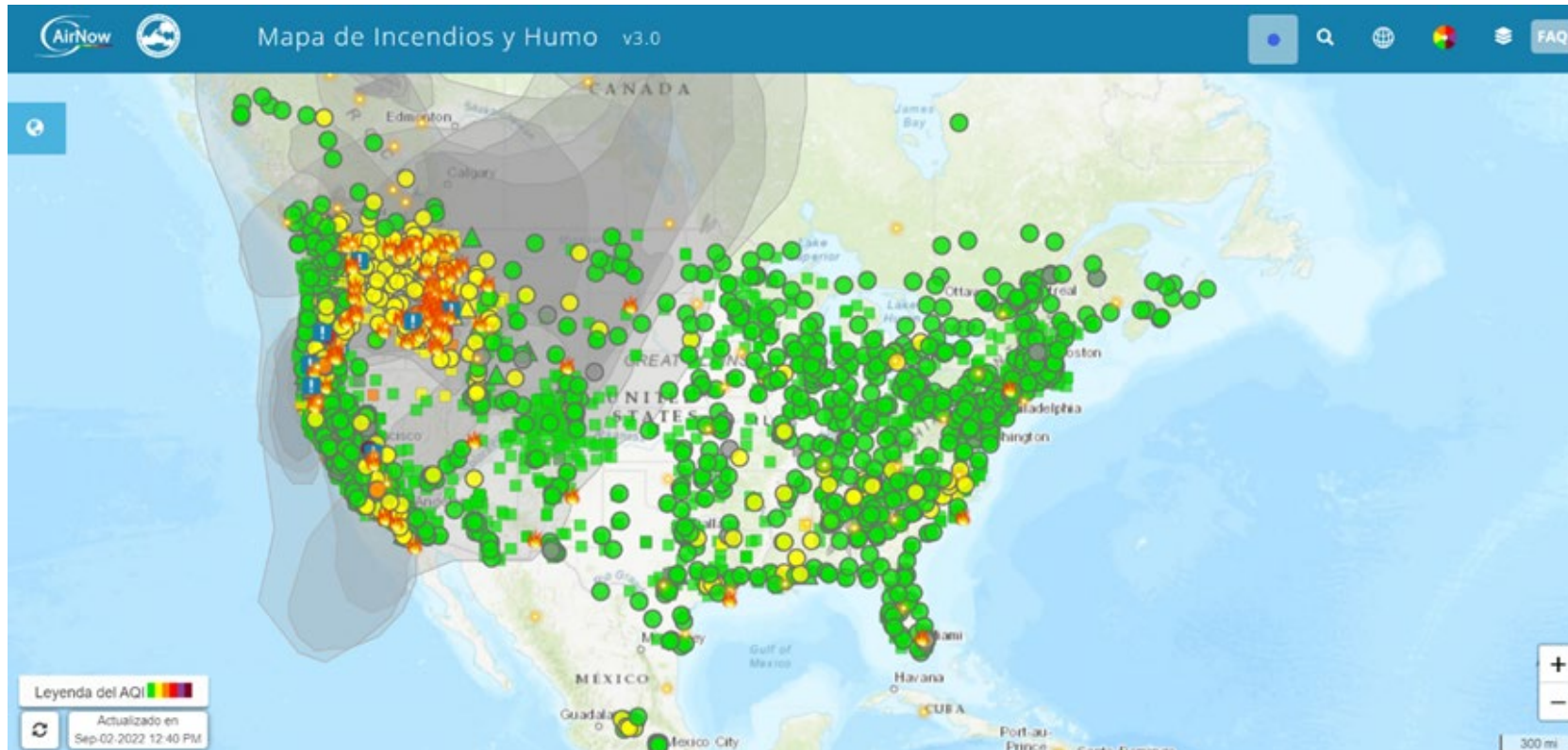
- Fire and Smoke Map now available in Spanish – launched 9/28/22
- AirNow "Recursos en Espanol" menu added
- Fire landing pages and FAQ questions in Spanish
- Please share this new resource!

The AirNow App

- Added Interactive Air Quality Map
- Added the AirNow Fire and Smoke map
- Designing a notification capability to replace the decade-old EnviroFlash email system
- Adding trends and ability to share screenshots via social media
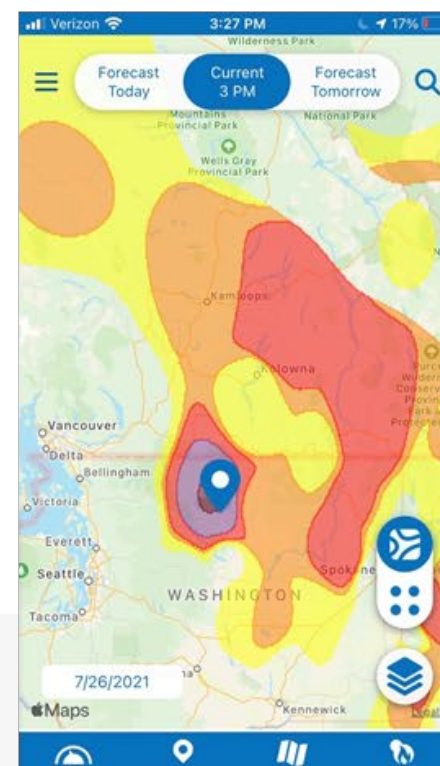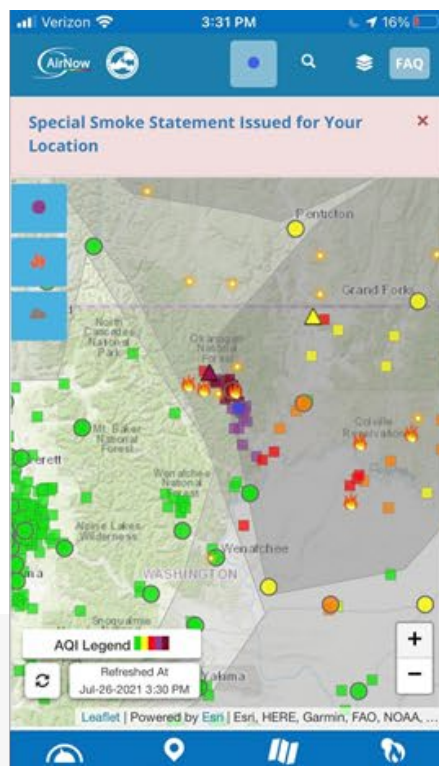
Single Ambient System: Requirements Analysis

- Started a Requirements Analysis work assignment in May 2022

- Major focus thus far on meeting with users at the National Ambient Monitoring Conference
  - Several in-person sessions: AQS Training, "Who are the Users", "Buy a Feature"

- Also holding interviews with:
  - Product Owners
  - Users

- Workshops planned after interview phase

- Testing of the proposed requirements

- Final deliverable will be a full set of requirements to build a single ambient repository

Early Results

- Raw results from two NAAMC feedback sessions
  - Customizable Reports were #1 feature in BOTH
- I'll walk through the process and raw results next

AQS Session 1

Feature Name	100	50	20	10	5	2	1	Session 1 Totals
Customized reports	11	7	4	9	7	12	12	1691
Integrated data visualization		7	8	5	9	11	6	6	1363
Expansions of QA/QC info- more specific feedback on how to correct data	7	2	1	1	3	4	4	1237
Better site management		7	4	6	10	5	6	3	1160
User friendly error messages	5	6	11	2	1	1		1047
More/better output formats	4	6	8	2	5	6	3	920
Ability to relate "parameters" in aqs to real world classifications	5	5	1	1	1	1	5	792
Ability to directly upload data to AQS (instead of going through exchange)	1	6	4	3	3	1	5	532
Design value (with time period and monitor)	3	2	3	1	4	3	1	497
More consistency in structure/format across files		4	6	9	5	6	6	453
More ways to evaluate data that is comparable to the data standard	3	1	1	2	2	2	3	407
Ability to save certain reports for future use		3	4	1	7	6	3	290
The ability to drill down	1							100
Granular permissions	1			3			2	132

AQS Session 2

Feature Name	100	50	20	10	5	2	1	Session 2 Totals
Customizable reports	5	3	1	3	3	4	6	729
Submit multiple files	4	4	2					640
Dashboard & report for annual monitoring network plan(?) & report	6			2				620
Context-sensitive help	3	1	4	3	3	3	2	483
Configurable lookouts for site and monitors	2	3		4	1	1		397
More format options for report exports (workfiles)	2	2	3		3	1		377
More modern edit and query functions		5	3	3				340
Strong API for bigger data queries	2	2		3	1			335
Frequent Q&A sessions	2	1	1		1			275
Input excel files		2	2	4	3			195
Support for knowing if data has already been uploaded		3	1	1	1	3	3	194
Improve login interface	1	1	1					170
All-in-one mapping tool			3		4	8	13	109
Bug reporting in app			2	2	3	5	3	88
A way to submit data directly to AQS in bulk			2	1	5			75
Select/filter sites by custom geographic areas			2	1	2	2		64
Data validation to handle anomalies that are entered via AirNow (real time)								0
English instead of codes								0

Next Steps: Single Ambient System

- Workshops after interview phase

- Testing proposed requirements

- Securing funding to start development

- Agile development methodology
  - Maximize participation of non-EPA users
  - Develop a Minimum Viable Product quickly
    - Test
    - Develop more
    - Test again

- Rather than releasing a new system all at once in several years, we plan to rebuild modules as we go

- Look forward to your input

Phase 2: Transfer Emissions and Regulatory Applications to the National Air Data Group (NADG)

- Electronic Reporting Tool (ERT) on October 1, 2022.
- Compliance and Emissions Data Reporting Interface (CEDRI) and WebFIRE on February 26, 2023.
- Combined Air Emissions Reporting System (CAERS) on February 26, 2023.
- MOSAIC-based applications on February 26, 2023:
  - State Planning Electronic Collaboration System (SPeCS).
  - Title V Petition Submittal Portal (TVPSP).

2022 and Beyond

- Exploring Integrating Other Air Quality Datasets
  - Develop a "fused" approach in which satellite, models, and low-cost sensor data (as well as other data sources that may not exist today) contribute to the most accurate air quality surface possible for all localities
  - Will be more comparable to other air quality vendor/sources of air quality information
- Provide air quality information for everyone and for more localized conditions
- Currently the AirNow dial reports the highest monitor in an area
  - Can over-report if the user is far from the monitor
  - Some areas only have ozone or PM10 monitors
- Combining observations, low-cost sensors, and NOAA air quality model

Questions?

Contacts

ITG Group Leader: Phil Dickerson
OAQPS IT Project Manager: Ketan Patel

Appendix: Ambient LEAN Events Summary

- Event 1 (2018) Key Take-aways
    - The current state (problem statement) isn't as much of a burden as we assumed it was
    - Stakeholders have automated much of their process
    - Stakeholders dislike the use of the Exchange Network and want an easier submission method
    - Project team developed a future state that proved:
        - A single process can be developed for all ambient air data
        - A single system can be developed to facilitate the process

- Event 2 (2022) Key Process Changes
    - Single data delivery process (more efficient and reduces need/cost for user training)
    - User-centered design
    - Portal for ticket tracking
    - Consistent data definitions/qualifiers
    - Easier to get data out of system
    - Better role-based security will empower users
    - API-first approach for meeting end-user needs
    - Cloud-first approach for providing scalable performance -- Platform-as-a-service
    - Data dictionary provides logical and physical data independence
    - Home for plug-in reports