

# Surveillance and Broadcast Services

## Alaska Industry Council

By: FAA, WSA

Date: February 13, 2008



Federal Aviation  
Administration



# AGENDA

- Opening Remarks - Jere Hayslett
- Technical Update – Jere Hayslett
- Operations Support – John Marksteiner
- Navigation Services Update – JoAnn Ford
- AIC Update – Joe Pearson
- Round Table



# Opening Remarks

- **Today's Agenda**
- **Round Table Introductions**

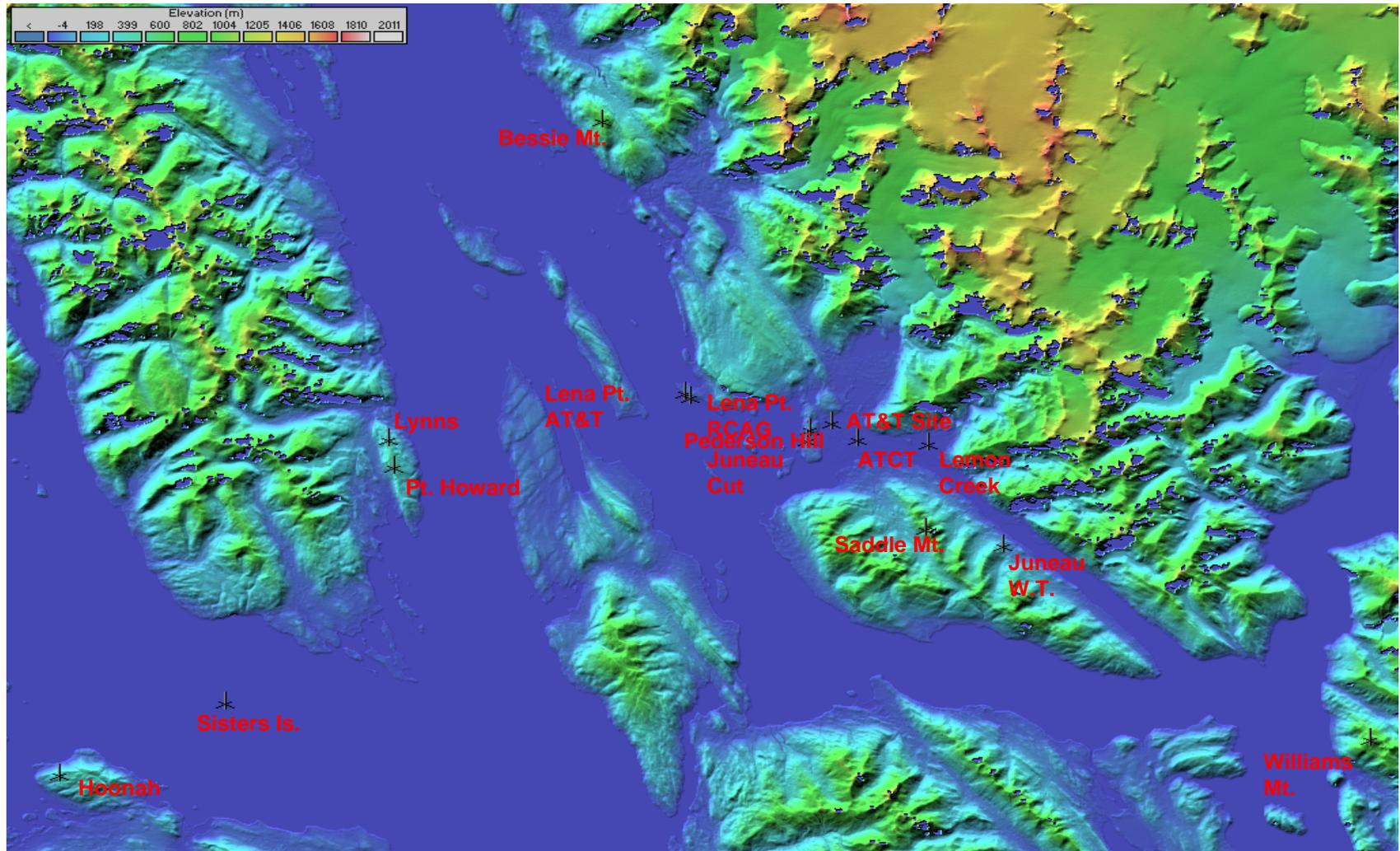


# SBS Technical Update

## SBS/Segment I (FY 07-10)

- Wide Area Multilateration (WAM)
  - Site selections have been finalized
    - 15 total sites proposed
    - 13 sites to be installed FY08
  - Contract Proposal under review
- **Service Volume 6 (ANC-FAI), 11 (OME), and 13 (OTZ)**
  - Engineering started for 5 GBT's
    - Anchorage - Complete
    - Fairbanks – 95% Complete
    - Kotzebue – 50% Complete
    - Curry – Location being finalized
    - Nome – Green Site, survey in spring 08
  - Conduct Surveys for 6 additional GBT's

# 15 Proposed JNU WAM Sites



# SBS Technical Update

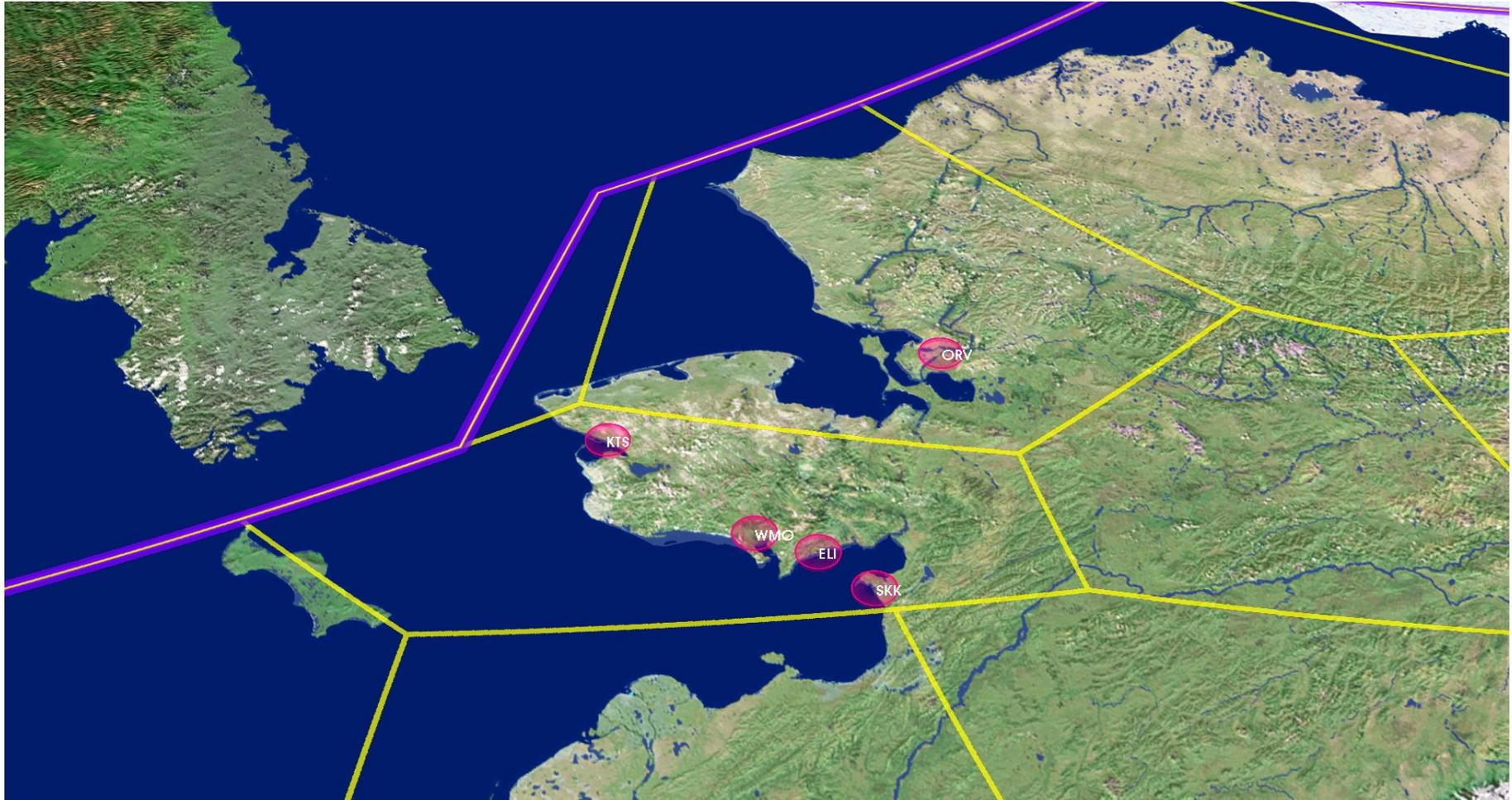
## Current AWOS Projects

- **Complete FY08**
  - Teller, Walles, Chevak, Kiana, Shungnak
  
- **Planned for FY08-09**
  - Brevig Mission (KTS), White Mountain (WMO), Elim (ELI), Shaktoolik (SKK)  
Bob Curtis Noorvik (ORV), Galena (GAL), Barter Island

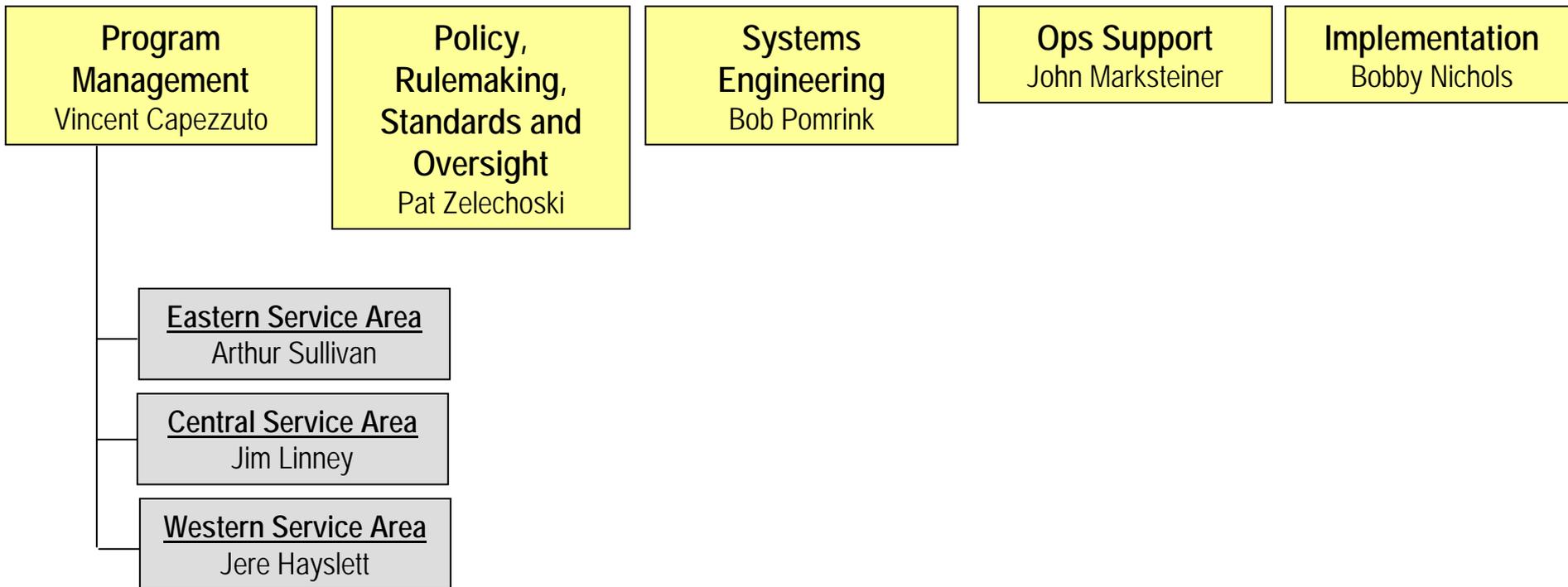
## Current Communication (RCO) Projects

- **Planned for FY08-09**
  - White Mountain
  - Brevig Mission

# Proposed Airport Upgrades in Service Volumes 11 and 13



# Surveillance and Broadcast Services (SBS) Organization



# Operations Support

**John Marksteiner**



# Navigation Services Update

JoAnn Y Ford

ATO-W Navigation Services;  
Navigation Systems  
Engineering

Update Briefing to the Alaska  
Aviation Industry Council

Feb 13, 2008



Federal Aviation  
Administration



# Navigation Services Update Profile

- **Current NAS LPV Totals**
- **Update 2008 Planned WAAS LPVs in Alaska**
- **Update of WAAS Software Release 8/9.1 and 8/9.2; and Alaska WAAS LPV vs. LPV 200 Availability**
- **Status - 4 remaining Alaska airports w/ “WAAS VNAV Unavailable”**
- **LP Approach vs. LPV Approach – avionics perspective**



# NAS LPV Procedure Publication Progress to Date (Current and all prior years)

|   |             |
|---|-------------|
| <b>LPVs Published to non-ILS Runways</b>  | <b>592</b>  |
| <b>LPVs Published to ILS Runways</b>  | <b>436</b>  |
| <b>Cumulative LPVs Published to Date</b>  | <b>1028</b> |
| <b>(current Alaska published LPV approaches: Anchorage, Homer, Emmonak, St. Michaels)</b> |             |
| <b>LPVs Published to &lt;250' Decision Altitude</b>                                       | <b>14</b>   |
| <b>(Above data is based upon February 14, 2008 publishing date)</b>                       |             |

# Alaska LPV approaches: Funded thru Navigation Services, SBS, Airports AIP, and SAAAR

- **Current LPV approaches**
  - Anchorage, Homer, Emmonak, St. Michaels
- **2008 Planned approaches (production dates and publish dates will differ)**
  - April 2008
    - Cold Bay RWY 32
    - St. Marys RWYS 17/35
    - Yakutat RWY 29
  - June 2008
    - Galena RWYS 25/7 (surveyed 2006)
    - Gulkana RWYS 15/33
    - Gustavus (Y) RWY 29
    - Prospect Creek PVT RWY1

# Alaska LPV approaches: Funded thru Navigation Services, SBS, Airports AIP, and SAAAR (cont.)

- **2008 Planned approaches**

- July 2008

- Bethel RWYS 1L/19R
- Sitka RWY 11

- September 2008

- Nuiqsit RWYS 21/3
- Birchwood RWY19R
- Badami PVT RWYS 21/3
- Ketchikan RWY 11
- King Salmon RWYS 11/(Y)29/(Z)29 (surveyed 2006)
- Kwethluk RWYS 18/36
- Napakiak RWYS 16/34
- Shageluk RWYS 16/34
- Kuparuk PVT RWYS 23/5

- November 2008

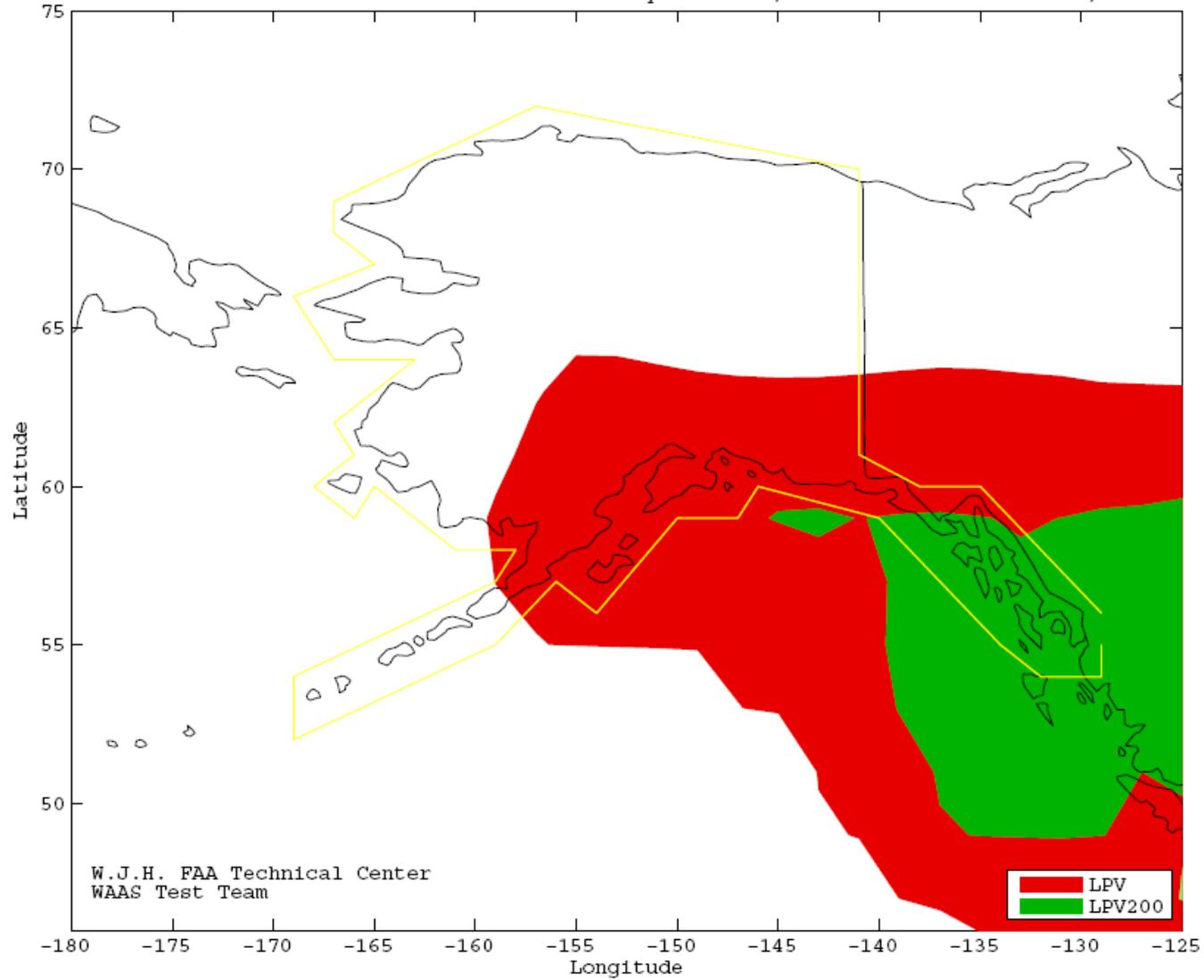
- Cordova RWY 27

# Update of WAAS Software Release 8/9.1 and 8/9.2; and Alaska WAAS LPV vs. LPV 200 Availability

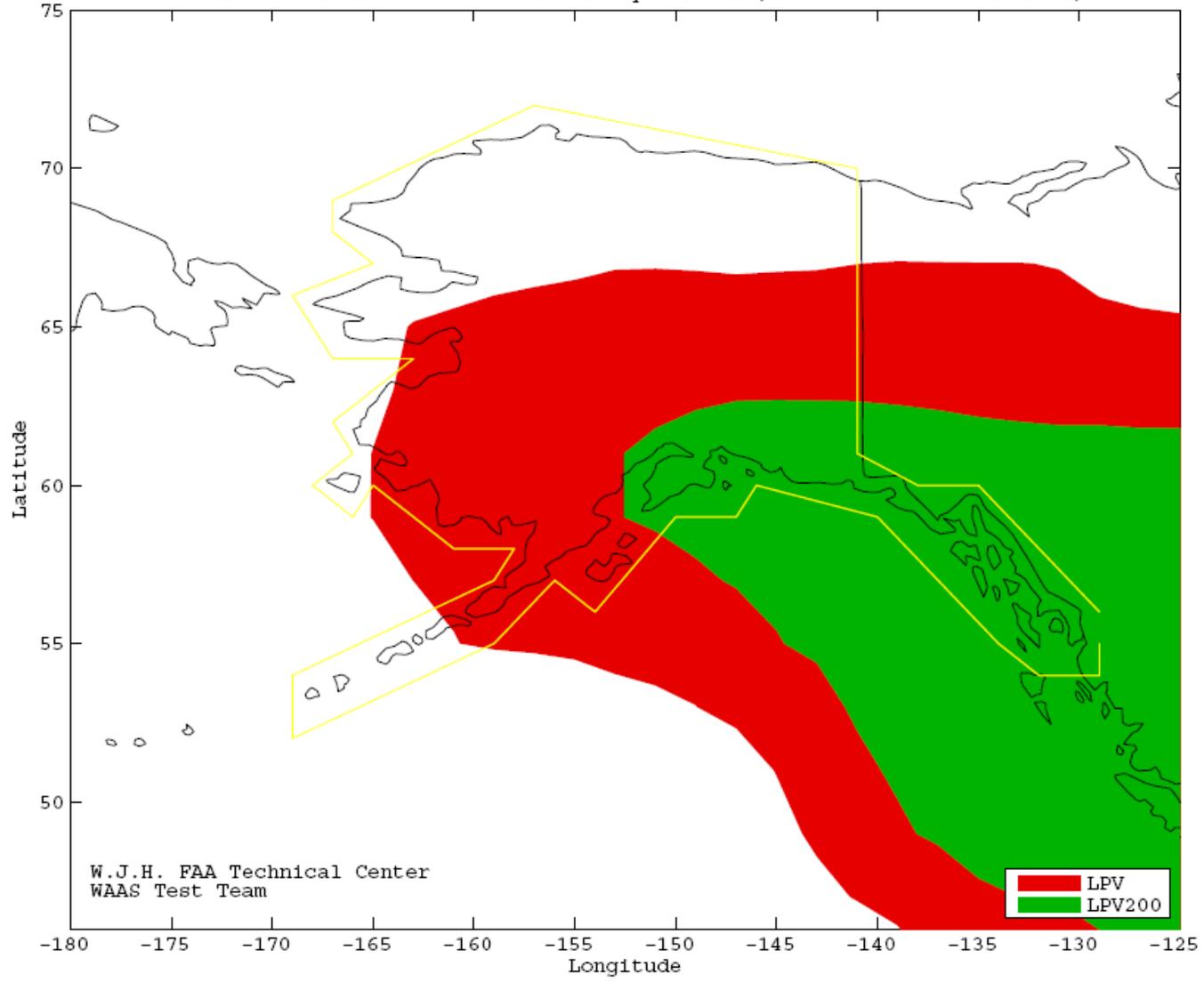
- **WAAS Software Releases 8/9.1 and 8/9.2 on track**
  - Software release 8/9.1 April 2008
  - Software Release 8/9.2 will provide most benefit to Alaska in September 2008
    - Recommend private industry testing be delayed until software release 8/9.2 testing is completed and is declared operational
- **FY2008 1<sup>st</sup> Quarter Alaska WAAS LPV vs WAAS LPV 200 Contours (slides to follow)**



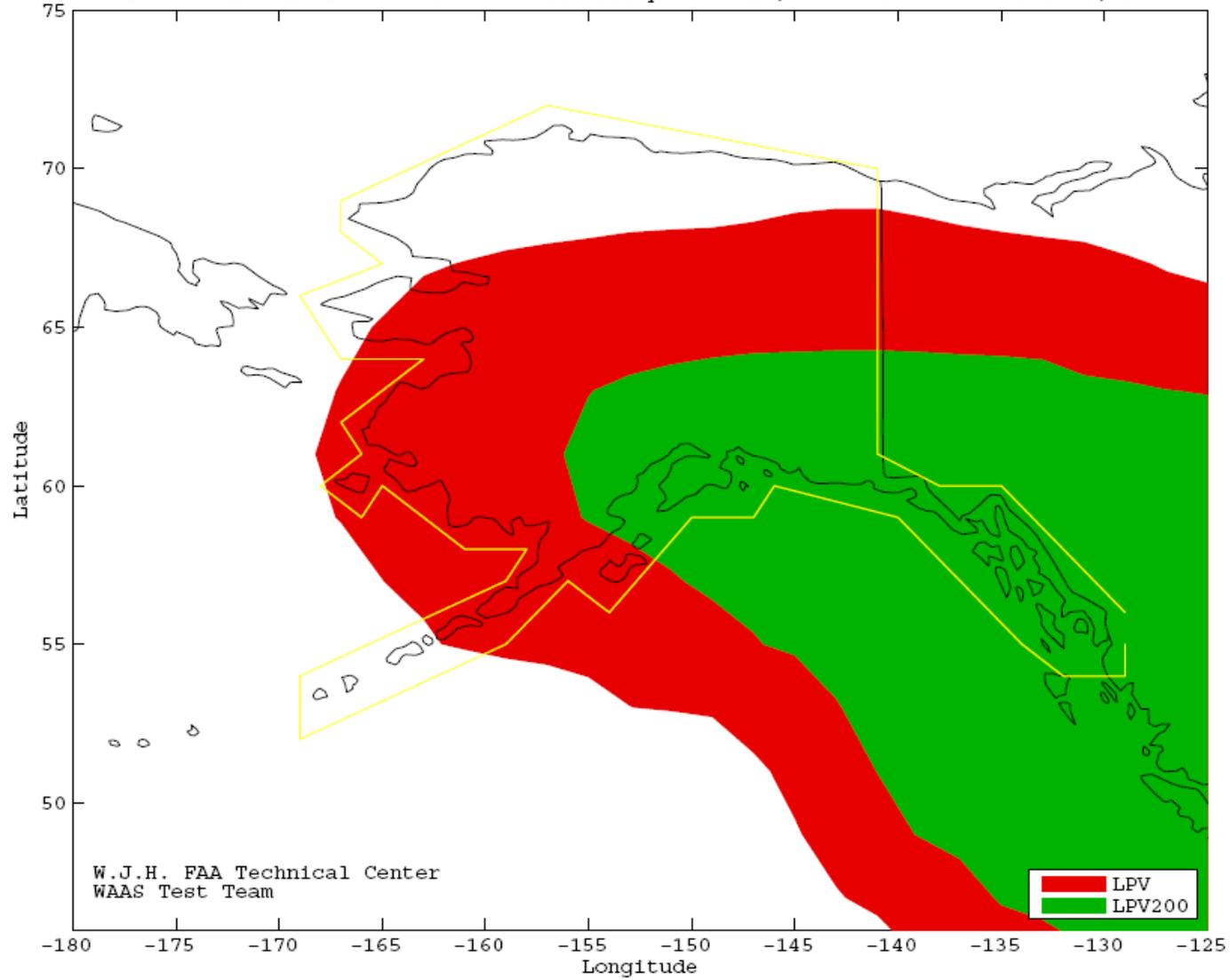
WAAS 99.9% LPV and LPV200 Alaska Availability Contours, October 1 - December 31, 2007



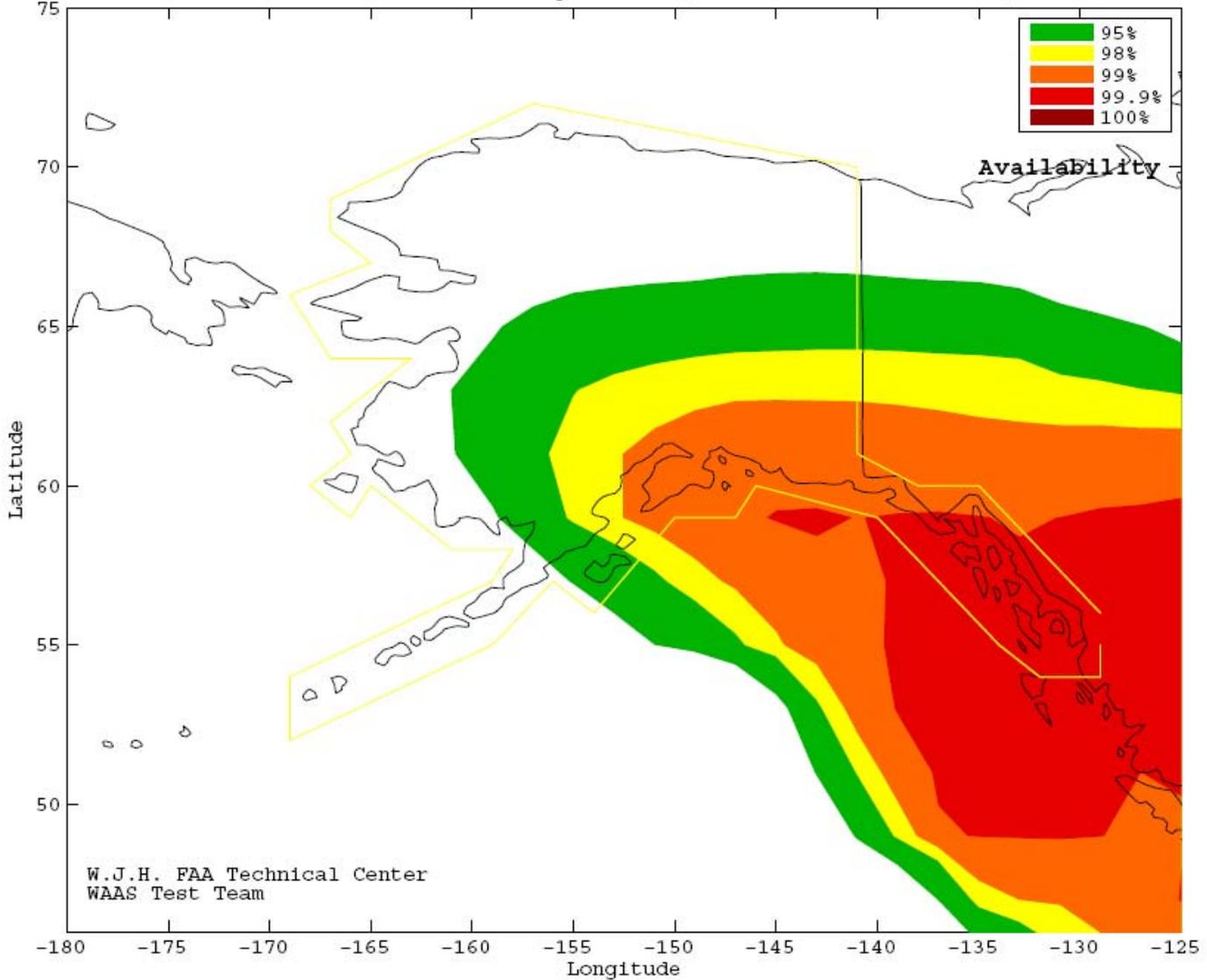
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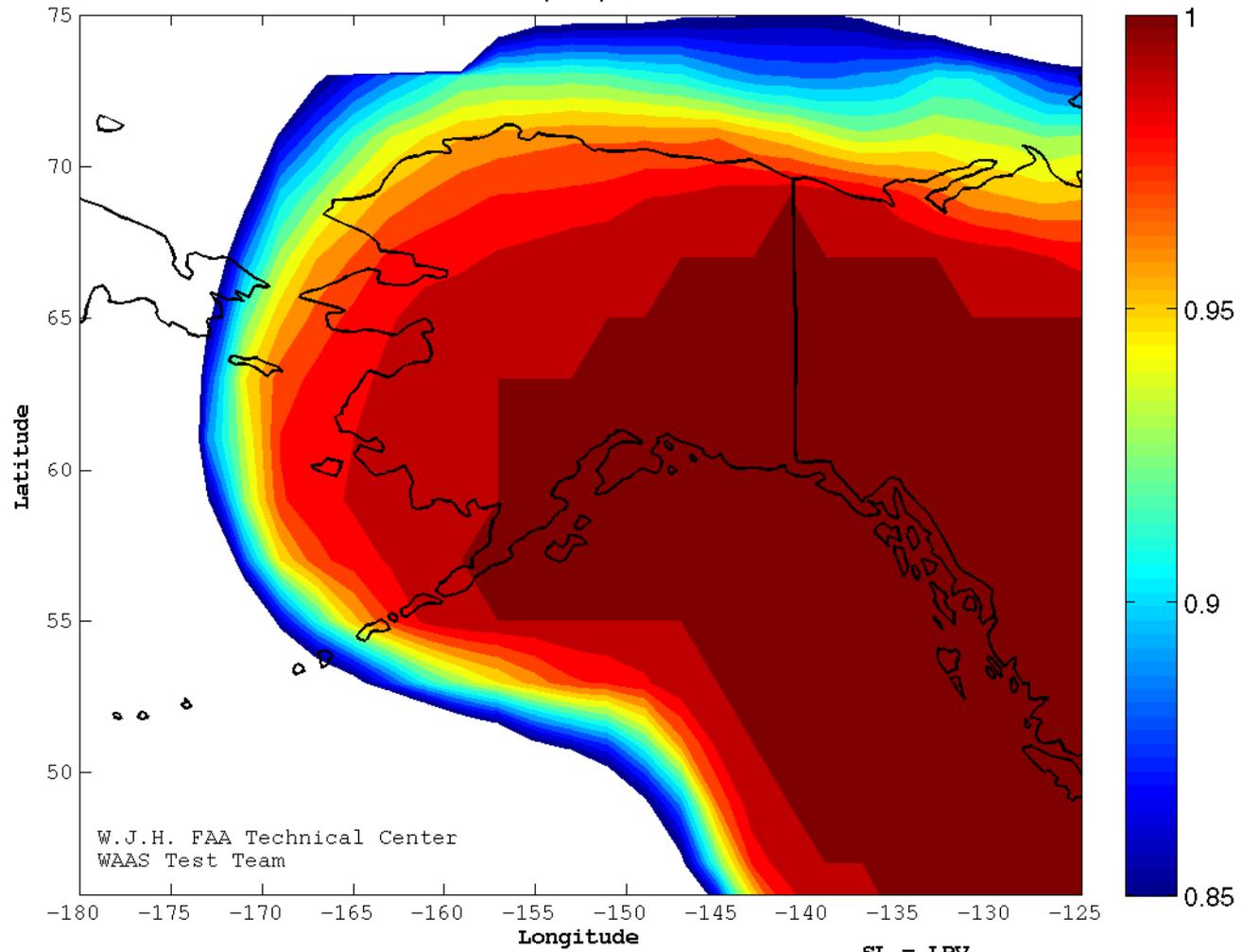
WAAS LPV 200 Alaska Availability Contours, October 1 - December 31, 2007



Alaska Coverage at 95% Availability = 47.83%  
Alaska Coverage at 99% Availability = 18.48%  
Alaska Coverage at 100% Availability = 0%

SL = LPV

WAAS LPV Alaska Coverage Contours -  
01/07/08



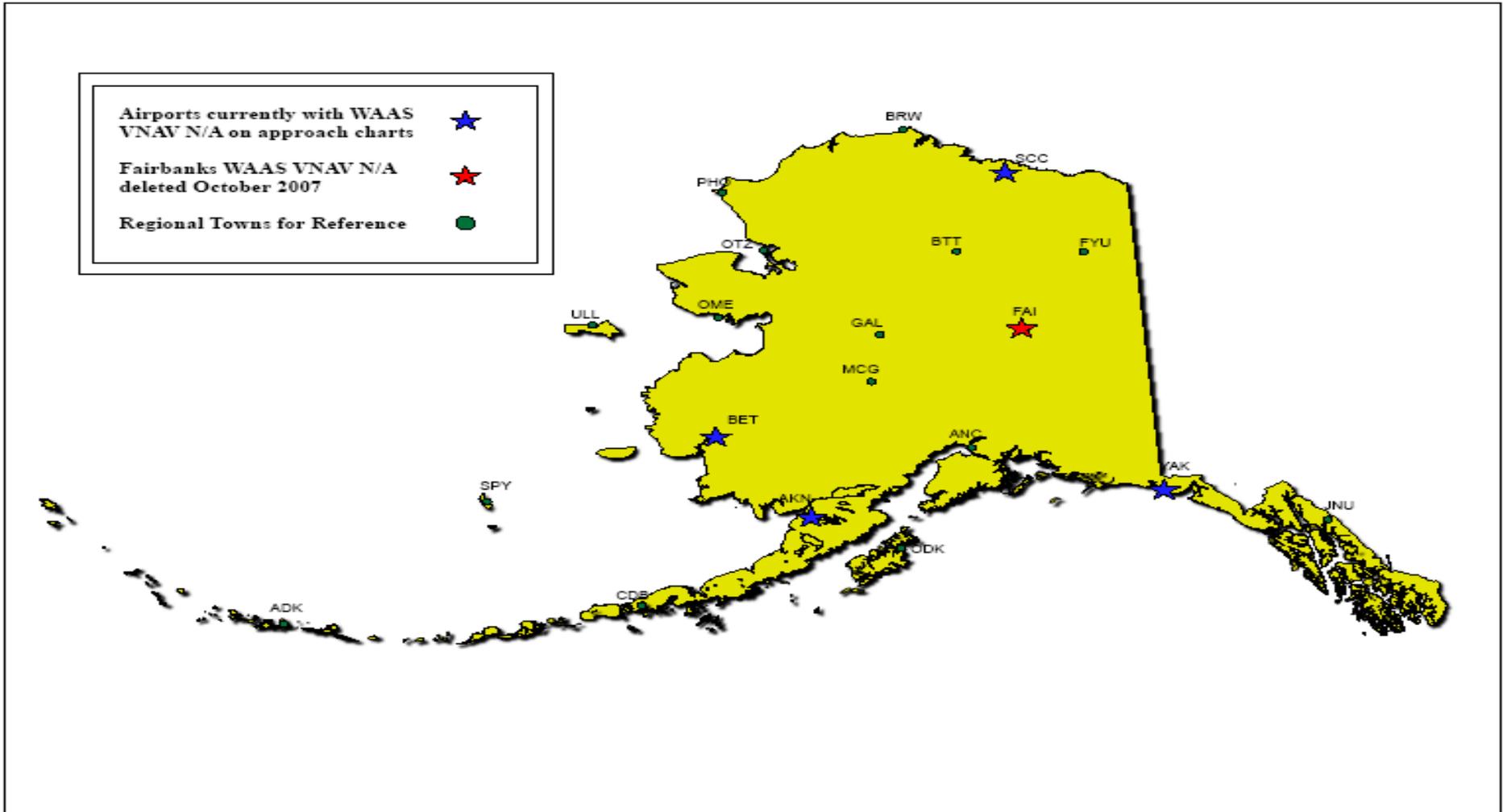
W.J.H. FAA Technical Center  
WAAS Test Team

Alaska Coverage at 95% Availability = 97.83%  
Alaska Coverage at 99% Availability = 71.74%  
Alaska Coverage at 100% Availability = 45.65%

SL = LPV



# Current 4 WAAS VNAV N/A



# New WAAS Procedures

- **LPV-200' Minimum**

- Minimum decision height of new LPV approaches lowered from 250' to 200'
- First approach published in 2006; 14 LPV-200s published as of 02/14/08
- Will re-evaluate 250 LPVs' for lower after flight inspection aircraft upgrade (2011) unless significant weather impact at airfield

- **LP Approach**

- Flown like a Localizer approach
- Can be developed at approaches that fail to meet LPV criteria due to obstacle clearance surface (OCS) penetrations (same TERPS for ILS)
- Criteria development in formal coordination; Publication starting in 2008
- Unlike an ILS, will have LPV or LP on approach chart, but not both
- If WAAS correction is lost, avionics defaults to LNAV procedure

# Overview: LP Approach vs LPV Approach

- **RTCA MOPS are implemented thru a Technical Standard Order (TSO) if the FAA agrees with the MOPS.**
  - TSO can implement MOPS in whole, in part, or not at all.
  - TSO is a legal mechanism to implement MOPS for design & production approval, but not airworthiness (installation) approval.
  - TSO not the only method to get design or production approval.
    - OEM Type Certificate/Production Certificate, Supplemental Type Certificate/Parts Manufacturing Approval (STC/PMA).
  - Installation accomplished thru STC.
    - Single or multiple (approve model list – AML).
- **TSO-C145b/C146b references DO-229D.**
  - TSO-C145a/C146a referenced DO-229C.
    - Can no longer apply for certification under revision 'a'.
  - TSO Authorizations for C145a/C146a equipment still valid.
    - Manufacturers can still produce and sell C145a/C146a equipment.
    - Major design changes require new TSOA under revision 'b'.
      - Governing regulation is Part 21.611 and Order 8150.1b paragraph 15 provides expanded information on TSOA design changes.

# DO-229D Versus DO-229C

- **DO-229D Major document re-write accomplished over multiple years.**
- **Significant technical requirements changes.**
  - Significant to engineers and manufacturers.
    - Difficult for users to understand operational impact.
  - Most technical requirements changes correct deficiencies in DO-229C related to accuracy/integrity/availability and include more rigorous testing.
    - Examples: GEO Bias Error, Correlator Tracking Constraints (spacing and antenna contribution to differential group delay), Signal Power Levels, Active Antennas, Higher Intra-System Interference Noise Levels.
    - **DOES NOT mean** that C145a/C146a equipment is bad.
  - Can be summed up as: More dependable WAAS receivers.

# DO-229D Versus DO-229C Con't

- **Some new operational capabilities.**
  - Localizer Performance without Vertical Guidance (LP).
    - Use the horizontal accuracy from LPV to get lower minimums than LNAV/VNAV.
    - LP somewhat analogous to ILS/Localizer; but:
      - LP and LPV not published together; and, LP not a ‘fail-down’ mode.
    - LP has higher assurance level for HMI (hazardous, same as LPV) than LNAV/VNAV and LNAV (major).
  - LPV “Fail-Down” mode to LNAV during approach.
    - Previously required missed approach.
  - Pilot ability to inhibit vertical guidance to support nonprecision approach training requirements.
    - Can do an LNAV approach even when LPV service is available.

# DO-229D Versus DO-229C Con't

- **New operational capabilities con't**
  - LPV service prediction capability allowed, but not required.
    - If implemented, equipment does an HPL & VPL prediction to forecast service availability.
      - Analogous to a RAIM prediction.
  - New helicopter operations appendix
    - Supporting Point-in-Space approaches.

# Changes on the Horizon

- **Eliminate DO-229D 3dB noise credit for Operational Class 1 and 2 receivers.**
  - Further analysis after MOPS and TSO publication concluded allowance is in error.
  - No impact on C145a/C146a equipment.
  - Currently, no impact on existing/planned C145b/C146b Class 1 equipment (no one makes Class 2 equipment).
    - Operational Class 3 receivers already comply.
  - Look for TSO-C145c/C146c.
    - Still in review process that includes public comment period.
- **Addressing discrepancies between DO-229D and ADS-B NPRM requirements.**
  - Discussion at SC-159.

# AIC Update

- **AIC continues to meet bi-weekly**
- **Avionics Equipage Team**
  - Met on January 17th
- **Coordinate, State, Federal and FAA interests**
  - Trip to Juneau February 6,7,& 8 to educate Law Makers
- **Next Steps**