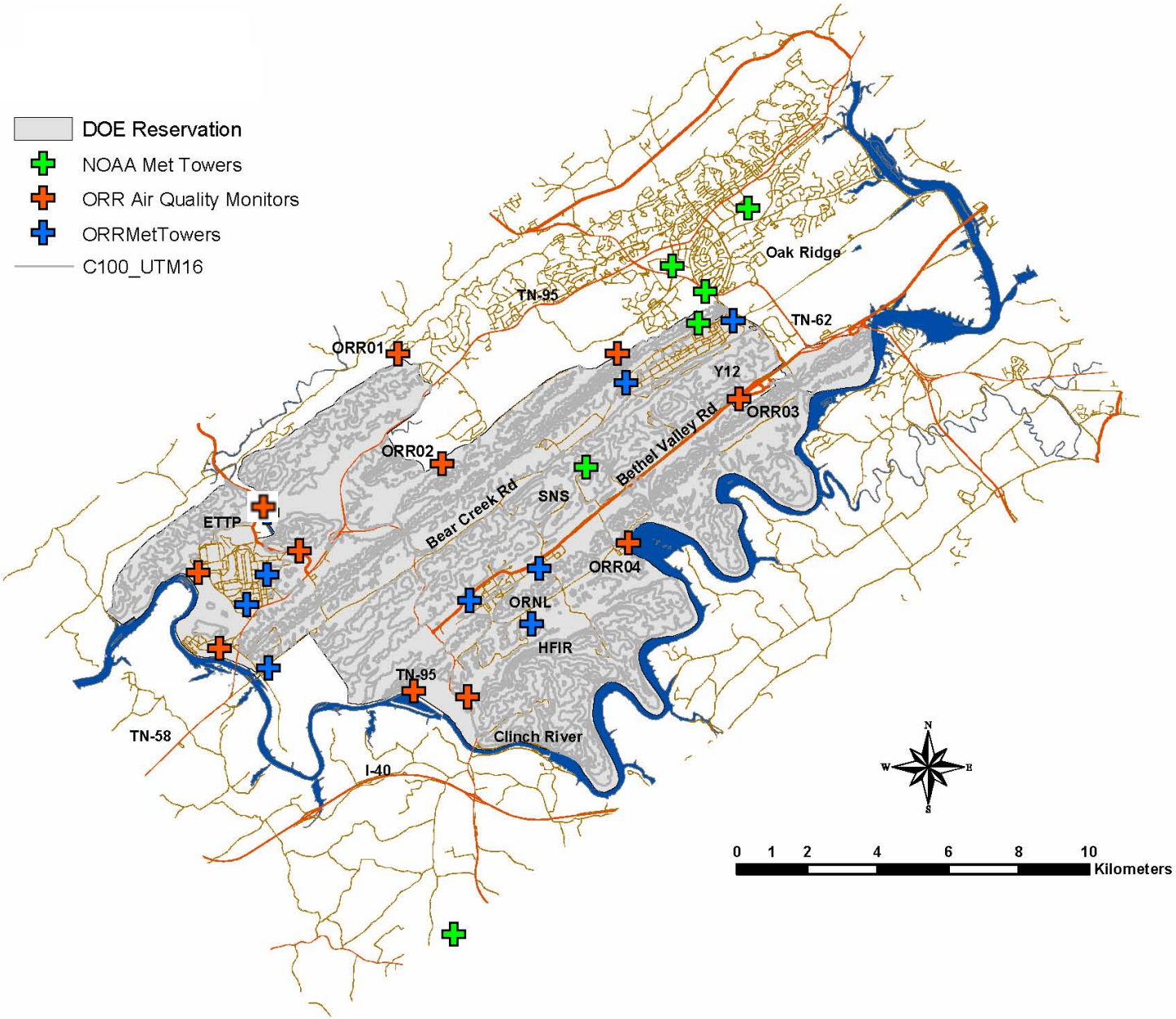
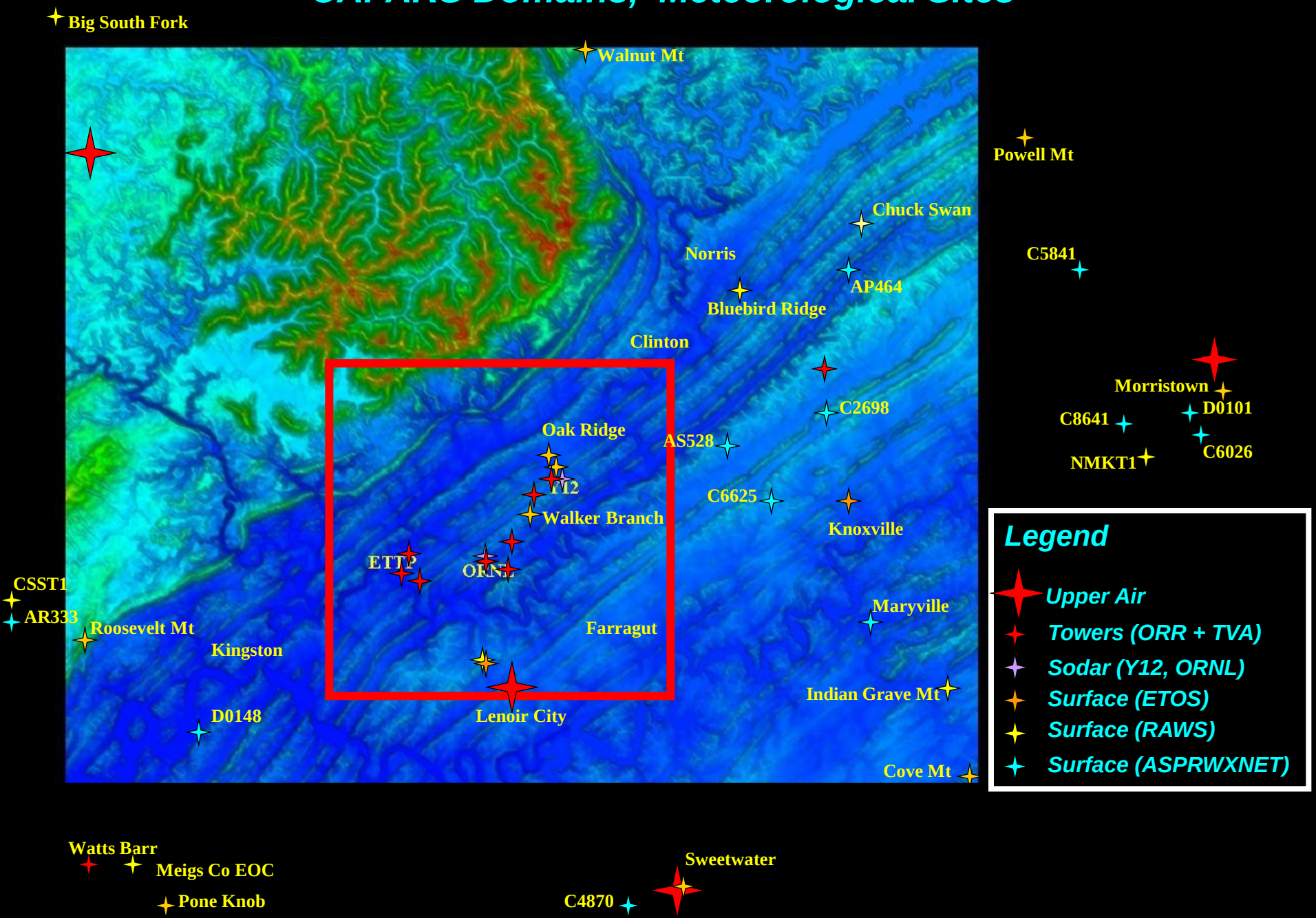
ORNL Meteorology Program

Environmental Compliance
Emergency Response
Laboratory Operations

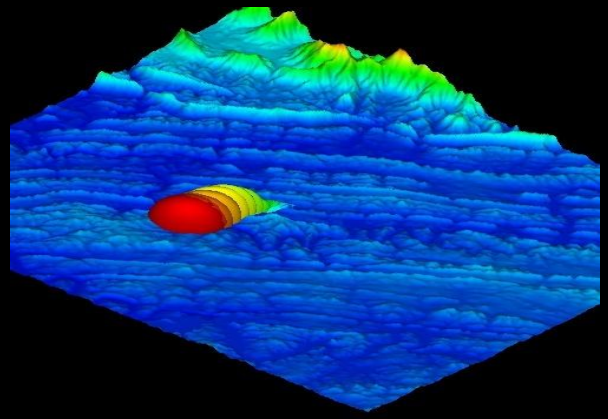
Kevin R Birdwell Ph.D., Meteorologist
Contact: 865.241.8085 (office) or 865.310.1527 (cell)
Jim Johnson, Laboratory Shift Superintendent
Contact: 865.574.6606


DOE Reservation
NOAA Met Towers
ORR Air Quality Monitors
ORRMetTowers
C100_UTM16
Oak Ridge
TN-95
TN-62
ORR01
Y12
ORR03
ORR02
Bethel Valley Rd
SNS
Bear Creek Rd
ETTP
ORR04
ORNL
HFIR
TN-95
TN-58
Clinch River
I-40
N
W
E
S
0 1 2 4 6 8 10
Kilometers

CAPARS Domains, Meteorological Sites



CAPARS Version 5.9 Features



- 3-D Puff Model
- 3-D Wind Field (10 levels at 120-meter resolution)
- 120-meter Terrain Resolution
- Land Cover data base
- Chemical (Custom, SCAPA)
- Radiological
- Short-Term Radiological Decay
- User-defined Biological
- Scenario Archiving
- Customizable Meteorological Input
- Rapid Runtime (99% 1 to 8 minutes)
- Output Maps (PAG, TEDE Dose,
  Air Concentration, Dry Deposition,
  Plume Timing, Wind Field)

Recent Issues

Backup Personnel

Limited funds for backup support (plan to train LSS staff as stop-gap)

Cyber-Attack

Shut down remote access (limiting daily QA, reports)

High-level IT scanning randomly affects data collection/distribution

Severity of attack removed all external data access (2 weeks)

Limited administrative computer privileges affects some processes

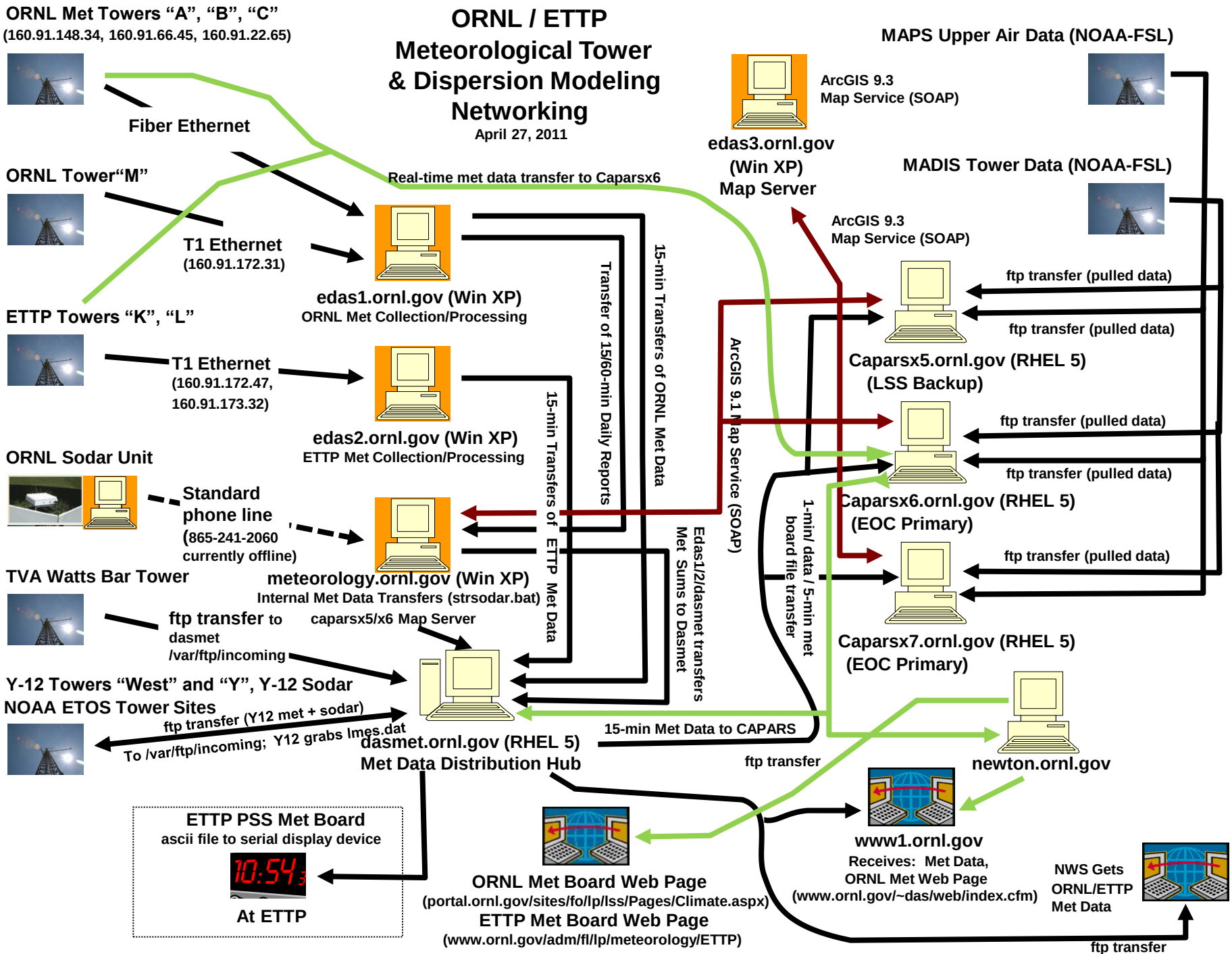
Complex Terrrain Meteorology

Progress being made on understanding local meteorological environment (Birdwell 2011)

Opportunities for EOC to collaborate with research goals

ORNL / ETTP Meteorological Tower & Dispersion Modeling Networking

April 27, 2011



Meteorological Program Staffing Support

One FTE member (Meteorologist)

15-20% Meteorological System Maintenance
20-25% Quality Assurance
10-20% Data Procession, Distribution
30-40% EOC Dispersion System Updates / Maintenance
5-10% On-call Met System / EOC Support (No Backup Meteorologist)

Part Time Support:

0.05 FTE – Programmer (4-6 hrs / month)
Web site / met system programming development

IT Support

0.01 FTE – Operating System Manager (20 hrs / year)
Maintain OS on Unix systems (meteorological / dispersion)

Tower Maintenance

0.15 FTE Shaw Environmental (quarterly calibrations / repair missions)

Dispersion Model Support

0.15 FTE AlphaTRAC, Denver, CO

LSS Staff (in training for back-up responsibilities)

FY2011-2012 Planned Upgrades / Updates

Met Towers

MOU with NOAA/ATDD for use of Chestnut Ridge Tower (150 m Equiv.)

Wind Monitors

Installation of sonic anemometer at Tower C

Met Data Collection Hardware / Software

Upgrade computer hardware / software to Windows 7

ORNL Sodar

Attempting to purchase Sodar replacement

CAPARS

Implementation of SQA-related procedures
Upgrade of CAPARS Map Servers (existing systems)
Installation of new CAPARS 64-bit System

Meteorology

Worst Case conditions in complex terrain
On-the-fly calculation of wind field regimes / prediction schemes

ORNL Meteorological Web Page

http://www.ornl.gov/~das/web/index.cfm

OAK RIDGE NATIONAL LABORATORY

Managed by UT-Battelle for the Department of Energy

OAK RIDGE RESERVATION METEOROLOGY
CURRENT METEOROLOGY

Tower-Specific ORNL Meteorological Displays (5-min Avg.)		
Tower A at 10m	Tower B at 15m	Tower C at 10m
Tower A at 30m	Tower B at 30m	Tower C at 30m
		Tower C at 100m

Tower-Specific ETTP Meteorological Displays (5-min Avg.)	
Tower K at 10m	Tower L at 10m
Tower K at 60m	Tower L at 30m

Alternate ORNL Meteorological Display (15min Avg.)	- ORNL Display
Alternate ETTP Meteorological Display (15min Avg.)	- ETTP Display

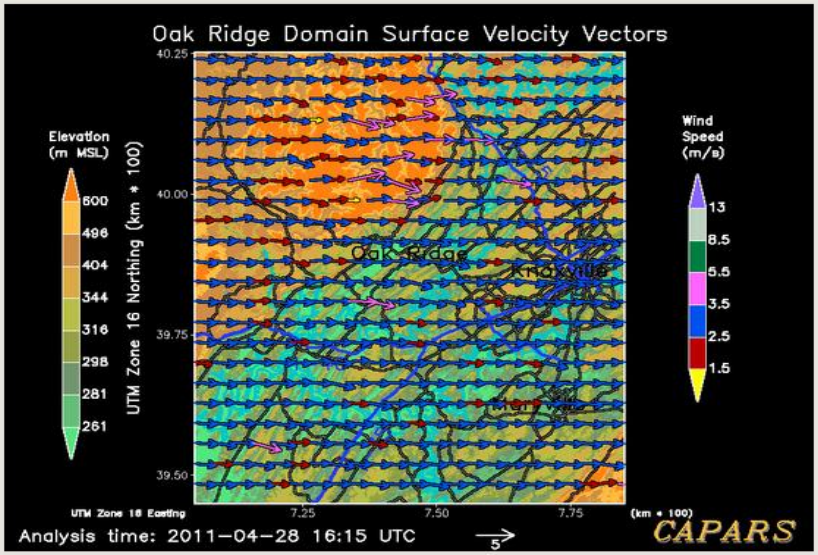
ORNL / ETTP Real-Time Meteorological Summaries (1-min Avg.)		
Tower A MAP	Tower B MAP	Tower C MAP
Tower K (1208) MAP	Tower L (1209) MAP	

ORNL / ETTP 15/60-minute Daily Meteorological Summaries	
Tower A and C 15-min Report A-MAP C-MAP	ORNL 60-min Tower Summary
Tower K and L 15-min Report K-MAP L-MAP	ETTP 60-min Tower Summary

Local Vertical Boundary Layer Profiles
Real-TimeY-12 Sodar Profile

CAPARS Output Maps - Latest Wind Field Output		
ORNL Area	Oak Ridge Reservation	Upper Air - 110 meters
Y12 Area	Oak Ridge Full Domain	Upper Air - 200 meters
ETTP Area		Upper Air - 1000 meters

CAPARS Links (ORNL Internal)		
Link to Caparsx5	Link to Caparsx6	Link to Caparsx7



1000 Area - Tower C @ 30 meters Apr 28, 2011 12:36 PM
Wind From: 276 W
Wind Speed: 10.5 MPH
Emergency Planning Zone: QRX
Temperature: 57F 14C
Soil Temperature: 18C
Peak Wind Speed: 18.8 MPH
Barometric Pressure: 29.02 in
Stability: B
Relative Humidity: 61%
24 Hour Precipitation: 0.00 in

ETTP - Tower L-1209 @ 30 meters Apr 28, 2011 12:34 PM
Wind From: 288 WNW
Wind Speed: 8.6 MPH
Emergency Planning Zone: KQRSXY
Temperature: 57F 14C
Soil Temperature: 18C
Peak Wind Speed: 21.8 MPH
Barometric Pressure: 29.15 in
Stability: B
24 Hour Precipitation: 0.00 in