

Radar & Applications Course (RAC): Orientation

1. Overview, Motivation, History

1.1 Title




Notes:

Welcome to the Radar & Applications Course (RAC) conducted by the National Weather Service (NWS) Warning Decision Training Division (WDTD).

1.2 Overview

Overview



"The purpose of RAC is to train NWS forecasters (meteorologists and hydrologists) on the use of the WSR-88D radar in the forecast and warning decision making process"

- Motivation
- History of this course
- Commerce Learning Center (CLC)
- WES-2 Bridge
- Quizzes and Instructor-Led Teletraining (ILT) sessions
- Course content
- Training facilitator responsibilities
- Support

Notes:

The purpose of RAC is to train NWS forecasters (meteorologists and hydrologists) on the use of the WSR-88D radar in the forecast and warning decision making process.

Here is an overview of this presentation. Please take a moment to review it.

1.3 Motivation

Motivation

Completion is necessary for career advancement in the NWS GS 5-12 1340 Competency-Based Model

Dimension 2: Generation of forecasts, outlooks, watches and/or warnings

Competency: Developing and issuing hazardous environmental information and alerts; Identify hazardous environmental information and incorporate this information including timely watches, warnings, advisories, and hazard outlooks into products and services.

| GS-5 to GS-7 | GS-7 to GS-9 | GS-9 to GS-11 | GS-11 to GS-12 |
|--|---|---|--|
| <ul style="list-style-type: none"> • Demonstrates, within a collaborative environment, ability to employ basic-level skill to identify hazardous weather, water, and climate information • Demonstrates, with assistance, ability to utilize all available tools to identify hazardous weather • Learns and understands rationale for criteria for hazardous weather alerts • Demonstrates ability to clearly communicate impacts to partners. | <ul style="list-style-type: none"> • Demonstrates, within a collaborative environment, ability to employ intermediate-level skill to identify hazardous weather, water, and climate information • Demonstrates, independently, ability to utilize all available tools to identify hazardous weather • Demonstrates, with supervision, ability to assess and issue timely hazardous weather alerts, including watches, warnings, outlooks, and advisories. • Clearly communicates impacts to partners. | <ul style="list-style-type: none"> • Demonstrates ability, with minimal supervision, within a collaborative environment, employs advanced-level skill to provide scientifically-sound assessments and issues timely and properly formatted advisories, watches, and warnings (inter-weather, wind, fire, marine and coastal, aviation, space, hydrologic) • Demonstrates ability, with minimal supervision, within a collaborative environment, provides scientifically-sound assessments and issues flash flood, severe thunderstorm, and tornado watches, advisories, and warnings • Demonstrates ability to assess and regularly support the watch, warning, advisory alerts process • Demonstrates ability, occasionally and with supervision, to integrate best practices, lessons learned, innovative techniques, and testing simulations into the forecast process • On occasion may serve as a key resource to others. | <ul style="list-style-type: none"> • Within a collaborative environment, employs advanced-level skill to provide scientifically-sound assessments and issues timely and properly formatted advisories, watches, and warnings (inter-weather, wind, fire, marine and coastal, aviation, tropical, space, hydrologic) • Within a collaborative environment, provides scientifically-sound assessments and issues flash flood, severe thunderstorm, and tornado watches, advisories, and warnings • Clearly communicates impacts to partners • Demonstrates the ability to serve as a key resource to others. |

Notes:

RAC is important because its training is necessary for career advancement in the National Weather Service's GS 5-12 1340 Competency-Based Model.

1.4 History of This Course

History of This Course



- WSR-88D Operations Course
 - 1990-97
 - 3.5 week in-residence course in Norman
- Distance Learning Operations Course (DLOC)
 - 1997-2015
 - 100+ hours of training
 - 1-week workshop
 - Boulder (2000-2004)
 - Norman (2005-present)
- Radar & Applications Course (RAC)
 - 2015-Present

Notes:

This course has steadily evolved over the years, but the focus has always been on the use of the WSR-88D in operations, particularly warning operations. It began in 1990 as the WSR-88D Operations Course which was taught as a 3 & 1/2 week in-residence course in Norman, Oklahoma. In 1997, it transitioned into the Distance Learning Operations Course (DLOC) and provided a blended learning approach which included web-based training, on-line modules, teletraining, and a 1-week workshop delivered at its conclusion. The name was changed to the Radar & Applications Course (RAC) in 2015 to provide a more accurate and meaningful description of the course, but it maintains the same format as DLOC.


2. CLC & WES-2 Bridge

2.1 Commerce Learning Center (CLC)

Commerce Learning Center (CLC)

- Completion status tracked via the CLC
 - Lesson quizzes
 - WES activities
 - Instructor-led training (ILT)

<https://doc.csod.com>



Point of Contact:
Andrew.C.Wood@noaa.gov
Phone: 1-405-325-3005

Notes:


We use the Commerce Learning Center (CLC) to track your completion of each part of the RAC: Lesson quizzes, WES activities, and ILTs. We recommend you bookmark the web address <https://doc.csod.com>. Most of the lessons are on-line training that you will launch directly from the CLC. Other training (such as AWIPS Warning Fundamentals) will be taken on your local WES machine, but you will need to come back to the CLC and take some action in order to show up as complete. Your point of contact is Andy Wood.

2.2 Commerce Learning Center (CLC): RAC Curricula

Commerce Learning Center (CLC): RAC Curricula

- Register for teletraining
- Track your progress

<https://doc.csod.com>




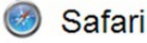

RAC Curriculum on your transcript

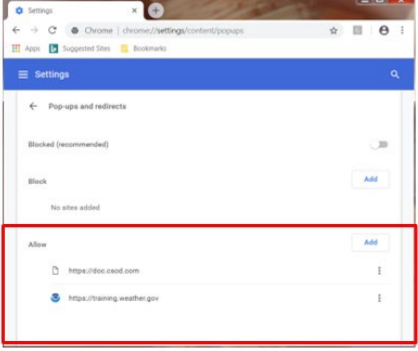
Notes:

Your RAC Curriculum is your path to course completion. Use it to register for teletraining sessions and track your progress.

2.3 Commerce Learning Center (CLC): Optimizing Use

Commerce Learning Center (CLC): Optimizing Use

- Preferred browsers
 - 
 - 
 - 
- Either turn off popup blocker or whitelist both the CLC and WDTD



Notes:

Google Chrome, Microsoft Edge, and Safari should all work effectively with the CLC.


If you have popup blockers on, you will not see the presentations appear when you select them unless you create an exception for the CLC and WDTD web sites.

2.4 WES-2 Bridge

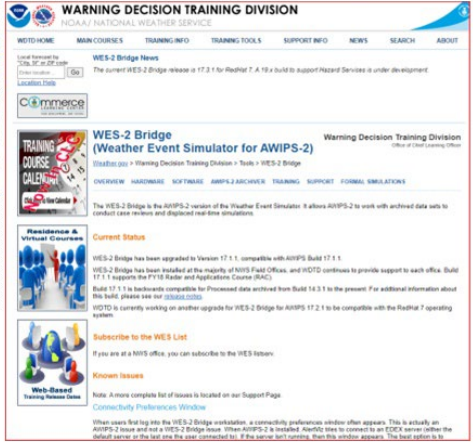
(Weather Event Simulator for AWIPS-2)

WES-2 Bridge (Weather Event Simulator for AWIPS-2)

<https://training.weather.gov/wtdt/tools/wes2/>



Point of Contact:
Dale.A.Morris@noaa.gov
Phone: 1-405-325-3008



WES-2 Bridge News
The current WES-2 Bridge release is 17.2.1 for Radial 7. A fix build to support Hazard Services is under development.

WES-2 Bridge (Weather Event Simulator for AWIPS-2)
The WES-2 Bridge is the AWIPS-2 version of the Weather Event Simulator. It allows AWIPS-2 to work with archived data sets to conduct look-reviews and digitalized near-time simulations.

Current Status
WES-2 Bridge has been upgraded to Version 17.1.1, compatible with AWIPS Build 17.1.1. WES-2 Bridge has been installed at the majority of NWS Field Offices, and WDTO continues to provide support to each office. Build 17.1.1 supports the FY10 Radar and Applications Course (RAC). Build 17.1.1 is backwards compatible for Processed data archived from Build 16.3.3 to the present. For additional information about this build, please see our [ISSUES/NOTES](#). WDTO is currently working on another upgrade for WES-2 Bridge for AWIPS 17.2.1 to be compatible with the Radial 7 operating system.

Subscribe to the WES List
If you are at a NWS office, you can subscribe to the WES listserve.

Known Issues
Note: A more complete list of issues is located on our Support Page.

Connectivity Preferences Window
When users first log into the WES-2 Bridge environment, a connectivity preferences window often appears. This is actually an AWIPS-2 issue and not a WES-2 Bridge issue. When AWIPS-2 is installed, AwWTO tries to connect to an EDEX server (either the default server or the last one the user connected to). If the server isn't correct, then this window appears. The best option is to

Notes:



WES-2 Bridge is a weather event simulator for AWIPS-2. You will use it during both the distance learning and in-residence Workshop lab portions of RAC. Your point of contact for WES-2 Bridge support is Dale Morris.

3. Quizzes and ILTs

3.1 Types of Training Modes

Types of Training Modes

- Web modules
 - Completed asynchronously
- Live, instructor-led teletraining (ILT) sessions
- WES-2 Bridge practice exercises
 - Practice applying knowledge you've learned in real-world settings



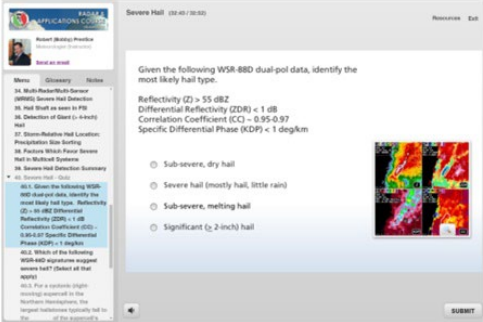
Notes:

RAC presents training material in various ways. Some are self-paced modules on the Internet. Others are recorded "Articulate" modules where the instructor's voice is paired with the relevant images. Another method is via live teletraining session where you and your classmates go through material together with a WDTD instructor. You must pre-register for each teletraining session via the RAC curriculum in the CLC and take it at the scheduled time.

3.2 End-of-Lesson Quizzes

End-of-Lesson Quizzes

- Must be completed on the Commerce Learning Center (CLC)
- Passing score is 70-80%



Given the following WSR-88D dual-pol data, identify the most likely hail type.

Reflectivity (Z) > 55 dBZ
Differential Reflectivity (ZDR) < 1 dB
Correlation Coefficient (CC) ~ 0.95-0.97
Specific Differential Phase (KDP) < 1 deg/km

Sub-severe, dry hail

Severe hail (mostly hail, little rain)

Sub-severe, melting hail

Significant (> 2 inch) hail

Notes:

Even though RAC lessons are available via our WDTD web page, End-of-Lesson Quizzes must be completed on the Commerce Learning Center (CLC) to receive completion credit. Passing score is 70-80%.

3.3 Instructor-Led-Teletraining (ILT): Overview

Instructor-Led-Teletraining (ILT): Overview

1. Register for the Instructor-Led-Training (ILT) sessions of your choice in your CLC curriculum.
 - Each student must register individually to receive credit
 - Register at least 24 hours in advance
2. Register for the accompanying GoToMeeting webinar
 - Use instructions in your "Approval" Email sent by the CLC



| Sessions | Location | Seats | Waitlist | Options |
|---|----------|-------|----------|---------|
| FY20-BAC-Connectives 3/17/2020 (Monday) 3:17:00 (Thursday) 1:00 PM CST Duration: 02:00 Location: WDTD National - WDTD National Weather Center - Norman, Oklahoma NOAA Language(s): English (US) | 13462 | 20 | 0 | Request |
| FY20-BAC-Connectives 3/17/2020 (Monday) 3:17:00 (Thursday) 1:00 PM CST Duration: 02:00 Location: WDTD National - WDTD National Weather Center - Norman, Oklahoma NOAA Language(s): English (US) | 13462 | 18 | 0 | Request |

Notes:

Teletraining means we train live over the internet. The registration steps are:

1. Register for the instructor-led training (ILT) session of your choice in your Commerce Learning Center (CLC) curriculum. Each student must register individually to receive credit in the CLC, even if multiple students from the same office attend the same session. Register at least 24 hours in advance.
2. Register for the accompanying GoToMeeting webinar using instructions in your "Approval" Email sent by the CLC. Contact WDTD (nws.wtdt.rachelp@noaa.gov) if the Email hasn't arrived within 24 hours (should come in just a few minutes)

3.4 Instructor-Led-Teletraining (ILT): Protocol

Instructor-Led-Teletraining (ILT): Protocol

- Dedicate time for your session
 - *“Do not disturb!”*
- Expect interaction
 - *Direct questions*
 - *Quiz questions*
 - *Annotate features*



Notes:

During teletraining sessions, dedicate undisturbed time for your session and expect interaction.

4. Course Content

4.1 RAC Tracks

Meteorologist vs Hydrologist

| RAC Tracks Meteorologist vs Hydrologist | |
|---|--------------------------|
| Orientation | MET, HYDRO |
| Introduction to the WSR-88D | MET, HYDRO |
| Principles of Doppler Radar | MET, HYDRO |
| Velocity Interpretation | MET, HYDRO |
| Base and Derived Products | MET, HYDRO |
| AWIPS Convective Warning Fundamentals | MET |
| Convective Storm Structure and Evolution* | MET |
| <small>Note: AWIPS Convective Warning Fundamentals should be completed before the Applied Performance Drills</small> | |
| Flash Floods | MET, HYDRO* |
| <small>Note: Online material for this topic should be completed before the Flash Flood Applied Performance Drills</small> | <small>*optional</small> |
| Storm-Based Warning Fundamentals | MET |
| Workshop Primer | MET |
| Workshop (Norman, OK) | MET |

Notes:

Let's discuss the RAC topics. You should complete them in order since they build on each other.

Most RAC students are Meteorologists who have been assigned to the Meteorologist Track, but a few are Hydrologists who have been assigned to the Hydrologist Track.

4.2 Topic: Introduction to the WSR-88D System

Topic: Introduction to the WSR-88D System

- Overall system description covering equipment groups
- Delivery Method
 - Instructor guided web module
- Completion Time
 - 1 hour



Notes:

The Introduction to the WSR-88D System topic is a self-guided, narrated, web module that discusses the overall system description and covers the equipment groups. Completion time is about one hour.

4.3 Topic: Principles of Meteorological Doppler Radar

Topic: Principles of Meteorological Doppler Radar

- How the WSR-88D collects, quality controls, and processes data into products
- Delivery Method
 - Instructor guided web modules
- Completion Time
 - 7 hours



Notes:

The Principles of Meteorological Doppler Radar topic consists of instructor guided web modules which cover how the WSR-88D collects, quality controls, and processes data into products. Completion time is about seven hours.

4.4 Topic: Velocity Interpretation

Topic: Velocity Interpretation

- How to interpret both large and small scale velocity patterns
- Delivery method
 - Instructor guided web modules
- Completion Time
 - 1 hour



Notes:

The Velocity Interpretation topic consists of instructor guided web modules which cover how to interpret both large and small scale velocity patterns. Completion time is about one hour.

4.5 Topic: Base and Derived Products

Topic: Base and Derived Products

- Covers products and the algorithms that generate them
- Delivery method
 - Instructor guided web modules
 - Instructor Led Training (ILT) session
- Completion time
 - 10 hours



Notes:

The Base and Derived Products topic covers products and the algorithms that generate them. Delivery method consists of both instructor guided web modules and an instructor led training session. Completion time is about ten hours.

4.6 Topic: Base and Derived Products (Cont'd)

| Topic: Base and Derived Products (Cont'd) | | |
|---|-------------------------------|---------|
| Introduction and Base Products | Instructor Guided Web Modules | 2.5 hrs |
| Reflectivity Derived Products | Instructor Guided Web Modules | 2.0 hrs |
| Velocity Derived Products | Instructor Guided Web Modules | 1 hr |
| Dual-Pol Derived Products | Instructor Guided Web Modules | 1 hr |
| Precipitation Estimation Products | Instructor Guided Web Modules | 1.5 hrs |
| Base and Derived Products ILT (Review & Case Study) | Teletraining | 2.0 hrs |

Students must register for Teletraining portion

Notes:

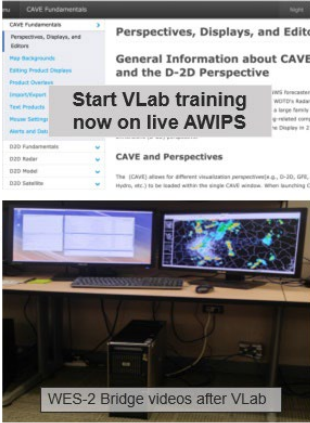
The lessons in this topic are organized into sections.

The final lesson "Products Review & Case Study" is an Instructor-Led Teletraining session. You must pre-register in the CLC for one of the sessions.

4.7 AWIPS Convective Warning Fundamentals

AWIPS Convective Warning Fundamentals

- Comprehensive AWIPS intro for convective warning decision making
- Delivery Method
 1. VLab [web pages](#) with [job sheets](#)
 2. WES-2 Bridge (local) practice [videos](#)
 3. [AWIPS Proficiency Test](#)
 4. [WES -2 Bridge \(cloud\) practice videos](#)
 5. [Hazard Services Proficiency Test](#)
- Prerequisite: RAC Orientation
- Expected Completion Time: 22 – 38 hours



Notes:

The AWIPS Convective Warning Fundamentals is a comprehensive introduction to all the AWIPS convective warning-related tools. All RAC students must take it, including “experienced” forecasters, because it’s important that everyone have the same WDTD approved skill set and be on the same page when they work together as a warning team in our Workshop simulations.

The delivery method is a blend of VLab, local WES-2 Bridge, and cloud WES-2 Bridge. Most of the VLab web pages and job sheets are taken on the live AWIPS. The initial practice videos must be taken on the local WES-2 Bridge workstation. Most of the content is independent of AWIPS builds, but there will be notes about any different AWIPS behaviors between builds in the VLab materials. The VLab job sheets and WES videos will prepare you to take an AWIPS proficiency test that is proctored by your local facilitator.

There is also a cloud-base WES-2 Bridge that will be used for the Hazard Services training and Hazard Services proficiency test that is also proctored by your local facilitator.

You can start the AWIPS Convective Warning Fundamentals immediately once RAC begins. Expect both VLab and WES-2 Bridge exercises to take 22-38 hours.

4.8 AWIPS Convective Warning Fundamentals:

WES Exercises

The screenshot displays the AWIPS software interface for WES Exercises. It features several windows:

- WarnGen**: A window with a 'WarnGen' title bar and a 'Warned Area Visible' checkbox. It includes a 'Track' section with radio buttons for 'One Storm' and 'Line of Storms', and a 'Warned Area Visible' checkbox. Below this is a 'UPDATE LIST' section with radio buttons for 'Severe Thunderstorms', 'Severe Weather Statement', 'Significant Weather Advisory', and 'Flash Flood Warning'. At the bottom, there are sections for 'BASIS FOR WARNING (CHOOSE 1)', 'THREAT (CHOOSE UP TO 1 EACH WINDSPEED)', and 'Instructions'.
- KCCX CELL Table**: A window titled 'KCCX CELL Table' showing a grid of data. The grid has columns for 'Cell ID', 'Time', 'Type', 'Status', 'Wind', 'Rain', 'Hail', 'Tornado', 'Other', 'Status', 'Wind', 'Rain', 'Hail', 'Tornado', 'Other'. The data is organized into rows, with some cells highlighted in yellow and red.
- Radar Display**: A window showing a radar display with overlaid labels for 'SCAN', 'PCR', 'FFMP', and 'FSI-optional'. The radar display shows a color-coded map of the area, with various weather features and boundaries.

Notes:

The WES Exercises cover AWIPS applications that you will use in warning decision making in your job.

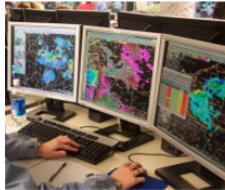
It is important for you to develop a basic proficiency with these different AWIPS tools even if your current office doesn't use all of them because you will likely use some of these at different offices in your career and you need the latest exposure to all these tools to make an informed decision about what tools ultimately work best for you. Because FSI has had some recent performance problems, it will be the lone optional part of the course. All the other applications are required for this course.

4.9 AWIPS Convective Warning Fundamentals:

Proficiency Test

AWIPS Convective Warning Fundamentals: Proficiency Test

- Demonstrate AWIPS radar and warning proficiency
 - Student will see assignment in CLC
 - Administered by training facilitator
- Score of at least 70% required
 - Retake at discretion of training facilitator
 - Tracking simplified
 - Training facilitator: Scan and email
Michael.A.Magsig@noaa.gov
- **Must complete before the Convective Storm Structure and Evolution topic's Applied Performance Drills**



Notes:

You will see the AWIPS Proficiency Test listed as an assignment in the CLC. It is a timed, paper exam administered by your training facilitator. The facilitator will observe your performance of specific AWIPS tasks. You will need to achieve a passing score of at least 70% on the test to receive credit. You may retake the test at the discretion of your training facilitator. After completing the exam your training facilitator simply scans the graded test and emails it to Michael.A.Magsig@noaa.gov and Mike will then enter the score in the CLC so you receive completion credit.

Note: You must complete the AWIPS Proficiency Test before the Convective Storm Structure and Evolution topic's Applied Performance Drills.

4.10 AFUN: Hazard Services

AFUN: Hazard Services

1. Hazard Services training in cloud (3-4hrs) uses updated WES-2 Bridge/AWIPS
 - Two 27" RITC monitors attached to a local machine on Internet "RITC Workstation"
 - Student instructions doc (**check email**)
 - Hazard Services proficiency test (1-2hrs)
2. Hazard Services training must be taken before the Flash Flood Applied Performance Drills

Hazard Information

HZ-2020-BAH-GRB-100213 FF.W.Connective IS

Type: Hydrology
Category: Hydrology
Type: Flash Flood Warning (FF.W.Connective)

Update Hazard Hatched Area

Time Range
Start: 06-Feb-2020 19:22
End: 06-Feb-2020 22:30
Duration: 3 hrs

Details
 Flash flooding occurring
Back location:
Rain so far:
 Unknown
 Between: 1.0 and 3.0 inches of rain have fallen
Expected Rainfall Rate:
 Unknown
 0.00 to 0.00 inch(es) in 0.0 hour(s) 0.

Preview... Propose

Notes:

The Hazard Services component of AWIPS Fundamentals is provided in the cloud using an updated version of WES-2 Bridge and AWIPS. Two 27" monitors were sent to every office for use with RAC, and these monitors will need to be attached to a local machine on the Internet that we will refer to as the RAC In The Cloud (or RITC) workstation to take the training.

Instructions for students to submit a request for cloud slots to take the training in the cloud is provided in the student instructions doc emailed separately at the start of the course.

The Hazard Services proficiency test is similar to the AWIPS proficiency test and will be proctored by the facilitator. The test will take about 1-2hrs.

Because the Flash Flood Applied Performance Drills uses Hazard Services to issue a flash flood warning, the Hazard Services training needs to be taken before the Flash Flood Applied Performance Drills.

4.11 Cloud WES-2 Bridge Access

Cloud WES-2 Bridge Access

1. Submit Google Form [request](#) at least **one day in advance**
 - Hazard Services (4hrs)
 - Hazard Services exam (2hrs)
 - Flash Flood Applied Performance Drills (4hrs)
 - Receive calendar invite approximately within 1 business day
 - Calendar updated with login info shortly before session
 - WDTD chats when instance ready
2. Cloud support 830am – 6pm central time Monday – Friday*
 - Contact: nws.wtdt.awips@noaa.gov

* Excluding holidays/weekends/blackout dates on form

Notes:

The Cloud WES-2 Bridge access for Hazard Services-related training is easy. Students use a Google Form to request cloud slots at least one day in advance. 4hr cloud slots are designated for the Hazard Services training and the Flash Flood Applied Performance Drills (APDs) training, while the Hazard Services exam is 2hrs.

You will receive a calendar invite approximately within 1 business day of your request that you need to accept. After you accept, your Google Calendar will update. This calendar entry will be updated with the login information shortly before the session on the day of.

WDTD will chat you using Google Chat when your cloud instance is ready.

The cloud training is available between 830am and 6pm central time Monday through Friday, and WDTD will use Google Chat to assist if you encounter any problems during these times.

If you have any questions or have special circumstances come up, contact the AWIPS team at this email address.

4.12 Topic: Convective Storm Structure and Evolution

Topic: Convective Storm Structure and Evolution

- Thunderstorms and all things severe
- Delivery method
 - Instructor guided web modules
 - Applied Performance Drills on WES
 - Instructor-Led-Teletraining session
- Completion time
 - 12 hours



Notes:

The Convective Storm Structure and Evolution topic covers thunderstorms and all things severe. Delivery method is instructor guided web modules, Applied Performance Drills taken on the Weather Event Simulator (WES-2 Bridge), and an Instructor-Led-Teletraining (ILT) session. This is the longest topic; completion time is about twelve hours.

4.13 Topic: Flash Floods

Topic: Flash Floods

- Covers concepts, products and tools useful for flash flood forecasting and decision-making
- Delivery method
 - Instructor guided web modules
 - Instructor-Led-Teletraining (ILT) session
- Completion time
 - 3 hours (modules) + 2 hours (ILT)



Notes:

The Flash Floods topic consists of instructor guided web modules which cover concepts, products and tools useful for flash flood forecasting and decision-making. There will also be an Instructor-Led-Teletraining (ILT) session. Completion time is approximately three hours for the modules and 2 hours for the ILT.

4.14 Topic: Flash Floods (Cont'd)

Topic: Flash Floods (Cont'd)

- Flash Flood Applied Performance Drills
- Delivery method
 - In the cloud
 - Take before your ILT
- Completion time
 - 3-4 hours




Notes:

Along with the Hazard Services training, we have Flash Flood Applied Performance Drills that are taken in the cloud. These should be taken before your ILT. The completion time for the Flash Flood APDs is between 3 to 4 hours.

4.15 Topic: Warning Fundamentals

Topic: Warning Fundamentals

- Provides the fundamental knowledge and skills required to issue effective storm-based warnings.
 - WarnGen
 - Recommended strategies for polygon creation and placement
- Delivery Method
 - Instructor guided web modules
 - Instructor-Led-Teletraining (ILT) session
- Completion time
 - 4.5 hours

A graphic for the 'Warning Fundamentals' course. It features a blue background with a radar tower and a satellite dish. The text 'Warning Fundamentals' is prominently displayed in white. Below it, 'Drawing the Warning, Part 1: Fundamentals' is written in yellow. At the top, there are logos for the National Weather Service and other agencies, along with the text 'Radar & Applications Course'. At the bottom, it says 'Warning Decision Training Division'.

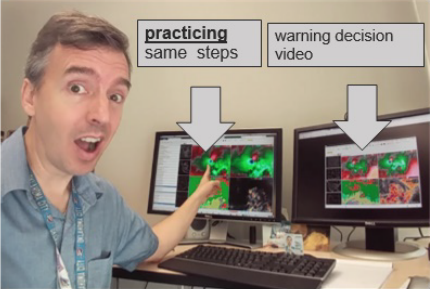
Notes:

The Warning Fundamentals topic provides the fundamental knowledge and skills required to issue effective storm-based warnings. Training includes skills for basic proficiency in using some AWIPS storm analysis applications such as WarnGen and recommended strategies for polygon creation and placement. Delivery method is instructor guided web modules and an Instructor-Led-Teletraining session. Completion time is about five and a half hours.

4.16 Workshop Primer

Workshop Primer

- **What:** Severe (2-3hrs)
- **Why:** Workshop catalyst
 - Puts it all together
 - Use workshop procedures
- **When:** Week before the workshop...not earlier
- **How:** Take severe primer on the WES then complete assignment (survey) in the CLC by noon CT Friday before the workshop
 - Afterwards, WDTD will mark the lesson complete in the CLC



practicing same steps

warning decision video

Point of Contact:
Sarah.Corfidi@noaa.gov

Notes:

One very important exercise that will help prepare you for the week of simulation nirvana at the workshop is the 2-3hr Severe Workshop Primer.

In this catalyst for the workshop, you will start to put everything together to issue warnings using WES-2 Bridge and get a head start on using the same AWIPS procedures you will use at the workshop.

The Workshop Primer should be completed any time in the week before the workshop (or as near as you can; NOT too early), so you refresh your skills right before you come to the workshop. That way you can focus on your higher-order learning skills, instead of remedial training at the workshop.


The Workshop Primer features demonstration videos playing on one monitor while you practice the same steps on the other monitor. Afterwards, complete the assignment (which is a survey) in the Commerce Learning Center (CLC) by noon Central Time the Friday before your workshop.

WDTD will mark the lessons complete in the CLC after the facilitator sends Sarah the score.

4.17 AWIPS/WES Course Materials

AWIPS/WES Course Materials

1. Disks containing Weather Event Simulator (WES) 2 Bridge cases with videos (if needed)
 - "AWIPS Convective Warning Fundamentals" videos
 - "Convective Storms" Applied Performance Drills videos
 - "Severe Workshop Primer" videos
2. WDTD updates your WES-2 Bridge at start of course
3. AWIPS and Hazard Services Proficiency Tests emailed to facilitators



Notes:

Most offices already have the WES-2 Bridge materials installed for this class's training. If you do not have the WES cases, we will send you the installation discs at the start of the course. This involves the AWIPS Convective Warning Fundamentals videos, the Convective Storms Applied Performance Drills videos, and the Severe Workshop Primer videos.

There are some further updates to the WES that our WES folks will install on your WES-2 Bridge workstation at the start of the course, so you will have everything you need.

The AWIPS proficiency test and Hazard Services proficiency test will be emailed to the facilitators at the start of the course.

4.18 Lesson Completions – Stay on Pace!

Lesson Completions – Stay on Pace!

- RAC is a **HUGE** course
 - over 100 hours
- All distance learning must be completed before a student is permitted to attend the workshop.
- WDTD will send status updates



Notes:

Please be aware that RAC is a **HUGE** course (over 100 hours) and all distance learning must be completed before a student is permitted to attend the workshop. Thus, it's important to stay on pace. It takes a big time commitment from the student and support for that time commitment from co-workers and the management team.

The RAC Project Leader (Bobby Prentice) will send status updates which include the latest "RAC Training Completion Report" and a course completion timeline in order to help keep you on pace.

5. Workshop

5.1 RAC Workshop

RAC Workshop

- Sessions include:
 - Warning Decision and You
 - Warning Methodology
 - Mini-Scenarios
 - Flash Flood Forecasting
 - Flash Flood Lab (pt 1 & 2)
 - Warning Issuance
 - Simulation Scenarios
 - Communication and Team Dynamics
 - Hazardous Weather Testbed (HWT) Visit
 - Storm Prediction Center (SPC) Visit



Notes:

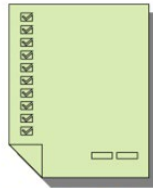
The Workshop is the culmination of RAC. It brings together everything you've learned, and more, into a laboratory and simulation environment. Most of your time at the workshop will be in the lab. Typically, you'll work with two (2) other forecasters and go through events in displaced real-time mode together.

5.2 RAC Workshop:

Prerequisites

RAC Workshop: Prerequisites

- All distance learning must be completed before the workshop, including:
 - All end-of-lesson quizzes
 - AWIPS/Hazard Services Tests
 - WES Exercises
 - Workshop Primer
- Arrive at workshop “warning ready” including:
 - AWIPS “knobology”
 - WarnGen fundamentals



Put me in Coach. I'm ready to play!

Notes:

You must complete all distance learning components before you may attend the workshop including: Lessons quizzes, AWIPS and Hazard Services Proficiency Tests, WES exercises, and the Workshop Primer. Students must arrive at the workshop “warning ready” including AWIPS “knob-ology” and WarnGen fundamentals. We want you to get the basics out of the way so we can work on your higher order warning forecaster skills at the workshop.

5.3 RAC Workshop:

Delivery Method

RAC Workshop: Delivery Method

- In-residence at the National Weather Center (NWC)
- You will be automatically registered via the CLC
- Completion time
 - 40 hours (8 am Monday - 5 pm Friday)
 - Due to flight schedules, many students will be unable to fly home until Saturday!



Notes:

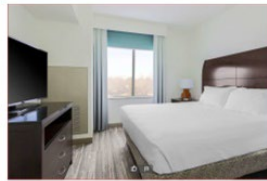
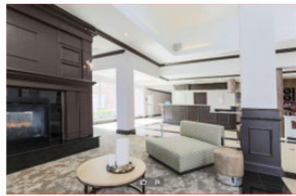
The RAC Workshop delivery method is In-residence at the National Weather Center (NWC). You will be automatically registered in the CLC. Completion time is 40 hours for the week, 8 am Monday through 5 pm Friday. Due to flight schedules, many students will be unable to fly home until Saturday!

5.4 RAC Workshop:

Lodging

RAC Workshop: Lodging

- Hilton Garden Inn
 - Shuttle bus service to and from the National Weather Center (NWC) will be provided



Notes:

Workshop lodging will be at the Hilton Garden Inn located near Interstate 35 in west Norman. This is a twelve (12) minute drive from the National Weather Center (NWC). Shuttle bus service to and from the NWC will be provided.

6. Training Facilitator Responsibilities

6.1 Training Facilitator Responsibilities

| Training Facilitator Responsibilities | | | | | | | | | | |
|---|--|----------|-----------------------------|---------------------------|--|-----------------------------------|----------------------|--------------------------------|---------------------------------------|------------------|
| Radar & Applications Course (RAC) FY2#-#: Completion Timeline (topics should be completed in order) | | | | | | | | | | |
| Class Begins | Orientation | | Intro to the WSR-88D System | Principles of Radar | Velocity Interpretation | Base and Derived Products & ILT * | | Hydro Track Course Completion | AWIPS Convective Warning Fundamentals | |
| | Lesson | Webinar | Topic | Topic | Topic | Topic | Webinar* | Topic | Webinar** | V.Lab, WES, Exam |
| | 28 min | 38 min | 1 hour | 6 hours | 45 min | 7 hours | 2 hours | | | 16 hours |
| | Recommended completion by | | Recommended completion by | Recommended completion by | Recommended completion by | Deadline | Deadline | Deadline (Hydro students only) | Deadline | |
| Day 0 | Day 0 | Day 0 | Day 1 | Day 14 | Day 15 | Day 40 | Day 41 | Day 41 | Day 83 | |
| | Convective Storm Structure and Evolution ILT * | | AFun: Hazard Services | Flash Floods | Flash Flood Applied Performance Drills | Flash Flood ILT * | Warning Fundamentals | Warning Fund. ILT * | Workshop Severe Primer ** | Workshop *** |
| | Topic | Webinar* | WES (live/lab) & Exam | Topic | WES exercises (cloud) | Webinar* | Topic | Webinar** | WES exercises | |
| | 16 hours | 2 hours | 6 hours | 3 hours | 4 hours | 2 hours | 5.5 hours | 1 hours | 2.5 hours | 46 hours |
| | Deadline | Deadline | Deadline | Deadline | Deadline | Deadline | Deadline | Deadline | Deadline (due 17Z) | |
| | Day 90 | Day 91 | Day 93 | Day 98 | Day 98 | Day 99 | Day 109 | Day 110 | Day 114 | Day 117-121 |

* Students must attend one of the Instructor-Led Training (ILT) sessions by the listed deadline. Completion of all the topic's lessons is a prerequisite before attending.

** Meteorologist Track students should take the Workshop Severe Primer the week before the workshop and need to submit the accompanying assignment in the Commerce Learning Center (CLC) by noon Central Time (18Z) the Friday before their workshop begins.

*** Be aware that RAC is a HUGE course and all distance learning lessons must be completed before a student is permitted to attend the RAC workshop.

Notes:

Your training facilitator plays a critical role. He/she must ensure you have adequate training time built into your work schedule, monitor your progress to ensure you stay on pace, and provide support and guidance.

6.2 Facilitator Responsibilities:

AWIPS Proficiency Test

**Facilitator Responsibilities:
AWIPS Proficiency Test**

- Install & test local WES exercise materials
 - Testing instructions provided with AWIPS Convective Warning Fundamentals release
- Proctor AWIPS Proficiency Test and Hazard Services Proficiency Test

WSR-88D DISTANCE LEARNING OPERATIONS COURSE
WARNING DECISION TRAINING BRANCH
AWIPS OPERATOR PROFICIENCY EXAM..EVALUATOR
VERSION

STUDENT _____ DATE 100%
EVALUATOR _____ TEST SCORE _____

Instructions:

- The following exam contains 40 questions that require the student to perform certain operations and/or make appropriate verbal responses. Many questions are worth 1 or 2 points each, with the rest worth more. There are a total of 100 possible points. The exam should be completed in 100 minutes or less. Please give students a few minutes to read over the instructions before beginning the exam.
- The student will use an AWIPS D-2D workstation (with at least OWS 0 loaded), preferably in practice mode, to perform all functions. The Topic 1 Student Guide, the AWIPS User Manual, personal notes or pre-saved office procedures on the AWIPS workstation are not allowed. You may review items on the exam with the student before the exam, but during the exam please do not provide any assistance to the student.
- You are the evaluator, and responsible for administering this test. Keep track of time for the student. You may clarify questions, but please do not give hints or let them know if their answer is right or wrong unless, in your opinion, their wrong answer prevents them from correctly answering subsequent questions. In these situations, the student must acknowledge that their time marks their final attempt prior to exit.

Notes:

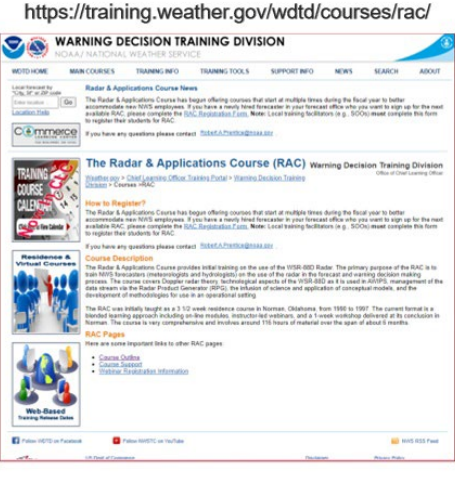
Your facilitator must also install and test the local WES exercise materials (unless they've already been installed) and proctor the AWIPS Proficiency Test and Hazard Services Proficiency Test. Testing instructions are provided with the AWIPS Convective Warning Fundamentals release.

7. Support

7.1 RAC Web Page

RAC Web Page

- News and Notes
- Course Description
- RAC Pages
 - Course Outline
 - Course Support
 - Webinar Registration Information



The screenshot shows the website for the Radar & Applications Course (RAC) under the Warnings Decision Training Division. The URL is <https://training.weather.gov/wtdt/courses/rac/>. The page features a navigation menu with links for Home, Main Courses, Training Info, Training Tools, Support Info, News, Search, and About. The main content area includes a 'Local Forecast by ZIP, IP, or ZIP Code' search box, a 'Course Calendar' section, and a 'Web-Based Course' section. The 'Course Description' section provides details about the course, including its purpose, content, and registration information. The 'RAC Pages' section lists links for Course Outline, Course Support, and Webinar Registration Information.

Notes:


The RAC web page is a good source for course information and support. Note...although the course outline has links to lessons on our WDTD web site and the CLC, you must access the lessons from your RAC curriculum on the CLC to receive credit.

7.2 VLab: RAC AWIPS Convective Warning Fundamentals web page

VLab: RAC AWIPS Convective Warning Fundamentals web page

<https://vlab.ncep.noaa.gov/web/oclo/rac/>

- WES-2 Bridge materials
- Shipping schedule
- Procedures download
- Installation guidance



Notes:

The VLab's AWIPS Convective Warning Fundamentals web page has all the documentation about WES-2 Bridge materials, shipping schedule, procedures download, and installation guidance. It should answer most of your AWIPS and WES-2 Bridge questions.

7.3 RAC Support

RAC Support

1. Your office's training facilitator (i.e., SOO/DOH)
2. RAC Web page <https://training.weather.gov/wtdt/courses/rac/>
3. The RAC Help Email list nws.wtdt.rachelp@noaa.gov
 - Better for general inquiries and quick responses
4. Contact instructors directly



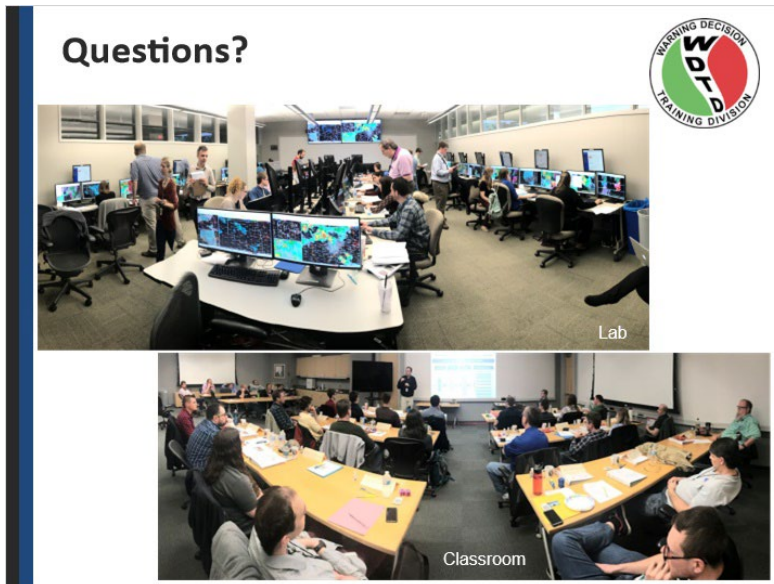
Notes:

There are four sources of RAC support:

1. Your office's training facilitator (usually your SOO or DOH).
2. RAC Web page
3. The RAC Help Email list which contacts the entire WDTD RAC Team. This is better for general inquiries and quick responses (for example, instructor is out of the office).
4. Contact instructors directly

The RAC Project Manager (Bobby Prentice) will also send RAC status updates via e-mail.

7.4 Questions?



Notes:

If you have questions about this orientation, contact the RAC Help list (nws.wdtd.rachelp@noaa.gov) or ask them verbally during the Orientation's Question and Answer webinar.