



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

Overview



RADAR & APPLICATIONS COURSE eLearning

"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"

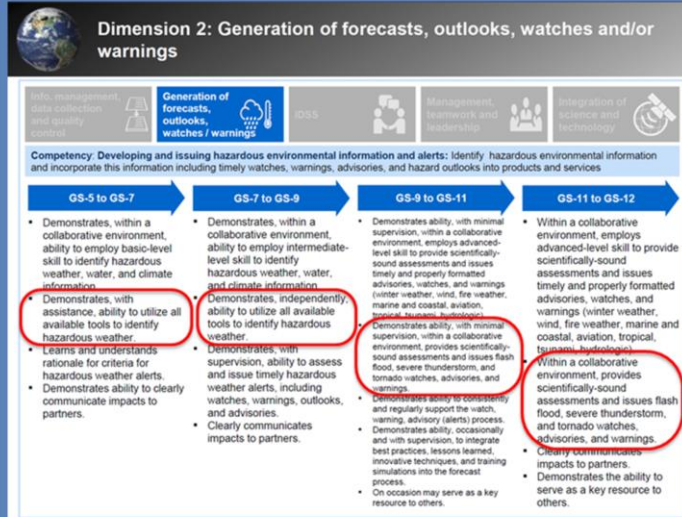
- Why you must complete RAC
- History of this course
- Commerce Learning Center (CLC)
- WES-2 Bridge
- Objectives, Quizzes, ILTs
- Course content
- Training facilitator responsibilities
- Support

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.

Why You Must Complete RAC

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



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

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

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.

Commerce Learning Center (CLC)

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

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



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.

Commerce Learning Center (CLC): RAC Curricula

- Register for teletraining
- Register for workshops
- Track your progress

<https://doc.csod.com>

The screenshot shows the Commerce Learning Center (CLC) website interface. At the top, there is a search bar and navigation links. The main content area displays the 'FY20 Radar & Applications Course (RAC) - Full Course (April 2020 Workshop)'. A progress indicator shows 15% completion. Below this, there is a list of curriculum items with their respective completion percentages and 'View Details' buttons. The items listed are:

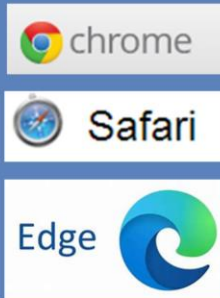
- FY20 RAC AWIPS 17.3.1 Convective Warning Fundamentals (3% completed)
- Introduction to the WSR-88D System (100% completed)
- Principles of Radar (0% completed)

RAC Curriculum on your transcript

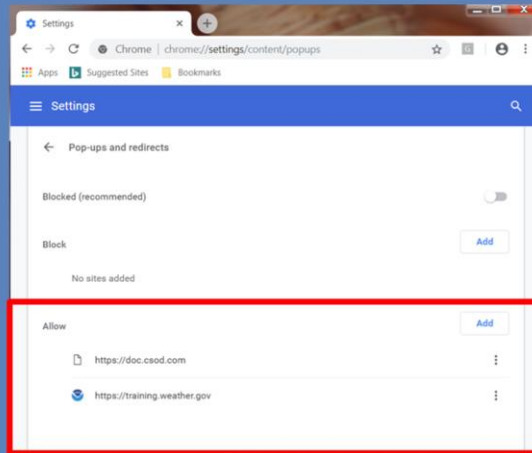
Your RAC Curriculum is your path to course completion. Use it to register for teletraining sessions, register for workshops, and track your progress.

Commerce Learning Center (CLC): Optimizing Use

- Preferred browsers



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



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.

WES-2 Bridge

(Weather Event Simulator for AWIPS-2)

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



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

The screenshot shows the NOAA Warning Decision Training Division website. The header includes the NOAA logo and the text "NOAA / NATIONAL WEATHER SERVICE". The navigation menu includes: WDT HOME, MAIN COURSES, TRAINING INFO, TRAINING TOOLS, SUPPORT INFO, NEWS, SEARCH, and ABOUT. A search bar is present with the text "Local forecast by 'City, St' or ZIP code". A "Go" button is next to it. Below the search bar, there is a "WES-2 Bridge News" section with a "WDTD has released WES-2 Bridge version 17.1.1. Upgrade to this build to use the latest AWIPS-2 build." A dropdown menu is open, showing options: "Buildit", "Weather Event Simulator (WES)", "WES-2 Bridge", and "RCARit". Below this, there is a "WES-2 Bridge (Weather Event Simulator for AWIPS-2)" section with a "Warning Decision Training Division" logo. The page content includes a "TRAINING COURSE CALENDAR" button, a "Current Status" section with text about the upgrade to version 17.1.1, a "Subscribe to the WES List" section, and a "Known Issues" section with a note about a complete list of issues on the Support Page and a link to "Connectivity Preferences Window".

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.

Objectives

- Learning Objectives
 - Evaluated via end-of-lesson quizzes
- Performance Objectives
 - Evaluated by your local training facilitator and WDTD instructors



Each lesson contains learning and/or performance objectives. A learning objective is an outcome statement that captures specifically what knowledge, skills, and attitudes learners should be able to exhibit following instruction. We assess it in RAC via an end-of-lesson quiz.

A performance objective is a statement that clearly describes the behavior or performance the learner is expected to exhibit as a result of training. We assess it in RAC via AWIPS WES exercises by your training facilitator, the AWIPS Proficiency Test by your training facilitator, and at the RAC Workshop Lab by WDTD instructors.

End-of-Lesson Quizzes

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

The screenshot shows a quiz interface for 'Severe Hail'. On the left is a navigation menu with items like '34. Multi-Radar/Multi-Sensor (MRMS) Severe Hail Detection', '35. Hail Shaft as seen in FSI', '36. Detection of Giant (> 4-inch) Hail', '37. Storm-Relative Hail Location: Precipitation Size Sorting', '38. Factors Which Favor Severe Hail in Multicell Systems', '39. Severe Hail Detection Summary', and '40. Severe Hail - Quiz'. The main content area contains the following text:

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

Below the table are four radio button options:

- Sub-severe, dry hail
- Severe hail (mostly hail, little rain)
- Sub-severe, melting hail
- Significant (\geq 2-inch) hail

To the right of the options is a small radar plot showing a cross-section of a storm with various radar returns. A 'SUBMIT' button is located at the bottom right of the quiz area.

End-of-Lesson Quizzes must be completed on the Commerce Learning Center (CLC). Passing score is 70-80%.

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	Locator Number	Seats Available	Waitlist	Options
FY20-RAC-Connective5 3/17/2020 (Tuesday) 1:00 PM CST - 3:00 PM CST Duration: 02:00 WDTD Webinar, WDTD, National Weather Center, Norman, Oklahoma, NOAA Language(s): English (US)	124682	20	0	Request
FY20-RAC-Connective6 3/27/2020 (Friday) 1:00 PM CST - 3:00 PM CST Duration: 02:00 WDTD Webinar, WDTD, National Weather Center, Norman, Oklahoma, NOAA Language(s): English (US)	124683	18	0	Request

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)

Note...The audio for each session is via WDTD’s RAC Line, 1-866-564-5812. Student passcode is 2094167# We no longer use the RAC line for audio!

Instructor-Led-Teletraining (ILT): Protocol

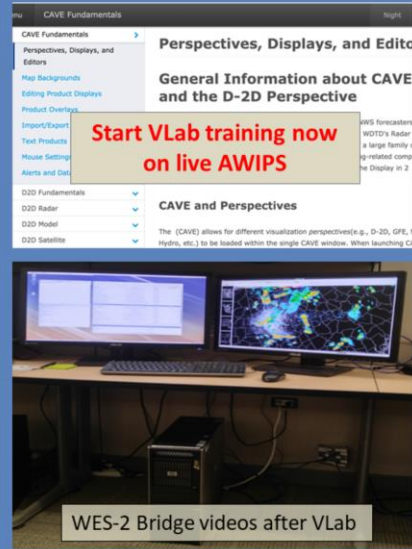
- Dedicate time for your session
 - *“Do not disturb!”*
- Keep phones muted, not on hold!
- Expect interaction
 - *Direct questions*
 - *Quiz questions*
 - *Annotate features*



During teletraining sessions: Dedicate undisturbed time for your session, keep phones muted, not on hold, and expect interaction.

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: 20 – 35 hours



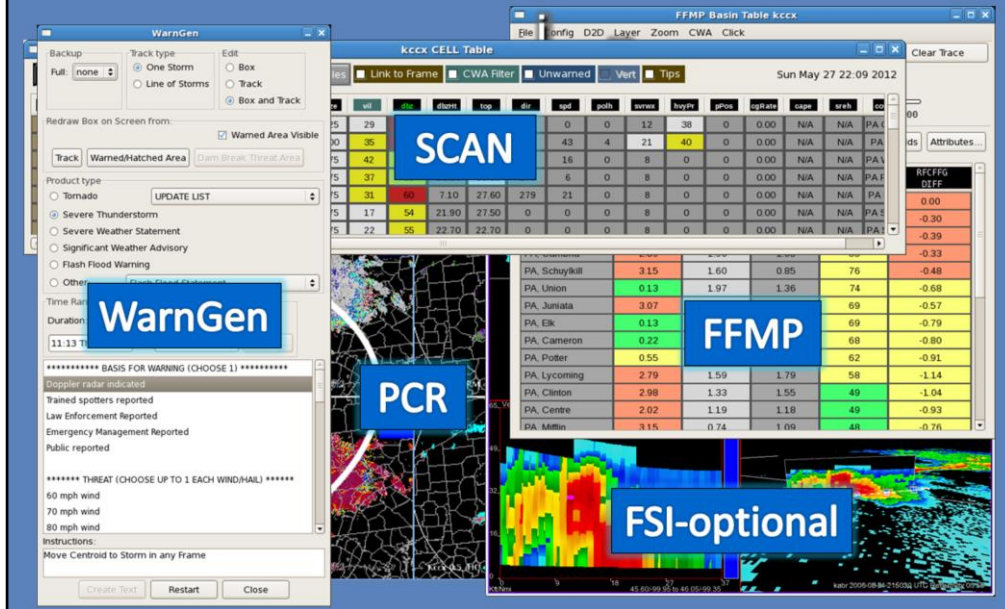
The AWIPS Convective Warning Fundamentals is a comprehensive introduction to all the AWIPS convective warning-related tools. All RAC students must take it, including “experienced” forecasters, because it’s important that everyone have the same WDTD approved skill set and be on the same page when they 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 20-35 hours.

AWIPS Convective Warning Fundamentals: WES Exercises

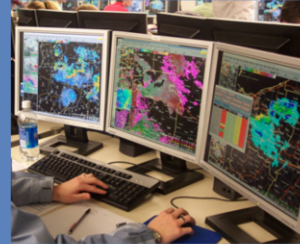


The WES Exercises cover AWIPS applications that you will use in warning decision making in your job.

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.

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***

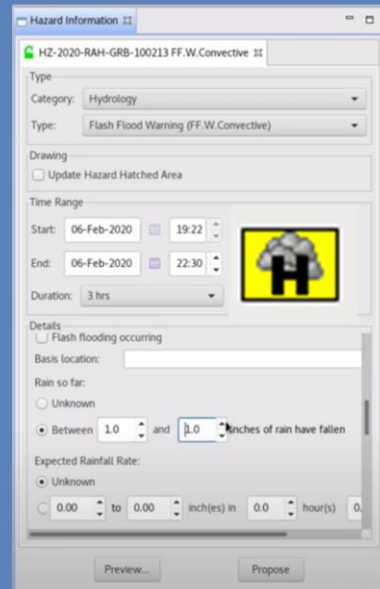


You will see the AWIPS Proficiency Test listed as an assignment in the CLC. It is a timed, paper exam administered by your training facilitator. The facilitator will observe your performance of specific AWIPS tasks. You will need to achieve a passing score of at least 70% on the test to receive credit. 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.

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 (course emails)
 - Hazard Services proficiency test (1-2hrs)
2. Hazard Services training must be taken before the Hydro Applied Performance Drills



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.

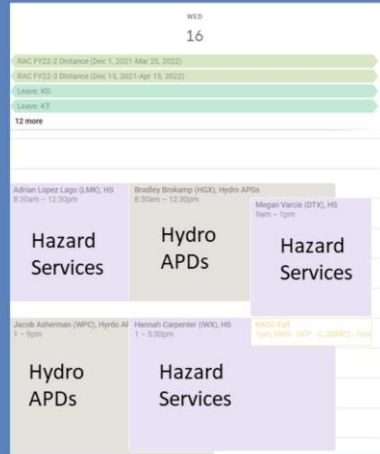
Instructions for students to sign up on the Google Calendar for cloud slots is provided in the student instructions doc which is provided in course emails.

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

Cloud WES-2 Bridge Access

1. Students invited to Google Calendar and request time
 - Click “Add This Calendar” link then create your calendar entry
 - Schedule at least 1 day before use and WDTD adds login info to entry
 - WDTD starts cloud sessions each morning and shuts down end of day
2. Available 830am – 6pm central time Monday – Friday
 - Contact: Micheal.A.Magsig@noaa.gov
3. Google Chat support (see student instructions doc)



The Cloud WES-2 Bridge access is easy. Students are invited to a Google Calendar and need to click on the link to add the calendar to their Google Calendar. The student simply creates a calendar entry for the time they need at least a day before it is needed. Each morning WDTD starts up the cloud instances and shuts them down according to the calendars.

There are actually two calendars, one for Hazard Services training and the other for Hydro Applied Performance Drills, or APDs, training.

The cloud training is available between 830am and 6pm central time Monday through Friday. Contact Mike for special circumstances.

We use Google Chat for supporting the cloud, so if WES has any issues starting up or you run into a cloud snag, we are just a chat away from fixing you up!

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



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.

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
Winter Weather	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
Storm-Based Warning Fundamentals	MET
Workshop (Norman, OK)	MET

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.

Topic: Introduction to the WSR-88D System

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



Instructor: Andy Wood

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

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



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.**

Topic: Velocity Interpretation

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



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.**

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



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.**

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

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.

Topic: Winter Weather

- Precipitation type analysis
- Accounting for errors in Snow Accumulation Algorithm (SAA)
- Delivery method
 - Instructor guided web modules
- Completion Time
 - 1 hour



The Winter Weather topic consists of instructor guided web modules which cover precipitation type analysis and how to account for errors in the Snow Accumulation Algorithm. Completion time is about one hour.

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



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.

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
 - Combined with Warning Fundamentals ILT
- Completion time
 - 3 hours



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 which will be combined with the Warning Fundamentals ILT. Completion time is approximately three hours.

Topic: Flash Floods

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



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

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
 - Combined with Flash Flood ILT
- Completion time
 - 5.5 hours



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 a combined Flash Flood/Warning Fundamentals Instructor-Led-Teletraining session. Completion time is about five and a half hours.

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 17Z Friday before the workshop
 - Afterwards, WDTD will mark the lesson complete in the CLC



Point of Contact:
Sarah.Corfidi@noaa.gov

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 17Z the Friday before your workshop.

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

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



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.

RAC Workshop

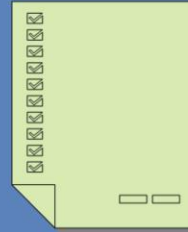
- Sessions include:
 - Warning Decision and You
 - Warning Methodology
 - Mini-Scenarios
 - Flash Flood Forecasting
 - Flash Flood Lab (pt 1 & 2)
 - Warning Issuance
 - Simulation Scenarios
 - Communication and Team Dynamics
 - Hazardous Weather Testbed (HWT) Visit
 - Storm Prediction Center (SPC) Visit



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.

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!

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.

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!



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!

RAC Workshop: Lodging

- Lodging and shuttle bus
 - National Center for Employee Development (NCED) Conference Center and Hotel
 - Provide WDTD with your travel info using the Commerce Learning Center (CLC)



Workshop lodging will be at the National Center for Employee Development (NCED) Conference Center and Hotel located three miles east of the National Weather Center (NWC) in Norman. Most of the hotel's guests are postal service employees in-training as students in the NCED Training Facility on the same grounds across the street. You will be asked to provide WDTD with your travel information in the RAC curriculum section of your NWS CLC account.

RAC in the Cloud Workshop Backup Plans

- In-residence workshops resumed in April 2022
- “RAC in the Cloud” (virtual) workshops are a backup plan in the event of a future COVID shutdown



In-residence workshops resumed in April 2022. “RAC in the Cloud” (virtual) workshops are a backup plan in the event of a future COVID shutdown.

Training Facilitator Responsibilities

Radar & Applications Course (RAC) FY22-#: Completion Timeline <small>(topics should be completed in order)</small>									
Class Begins	Orientation		Intro to the WSR-88D System	Principles of Radar	Velocity Interpretation	Base and Derived Products & ILT*		Hydro Track Course Completion	Winter Weather Applications
	Lesson	Webinar	Topic	Topic	Topic	Topic	Webinar*		Topic
	29 min	30 min	1 hour	8 hours	45 min	7 hours	2 hours		1 hour
	Recommended completion by	Attendance is optional	Recommended completion by	Recommended completion by	Recommended completion by	Deadline	Deadline	Deadline (Hydro students only)	Recommended completion by
Day 0	Day 0	Day 0	Day 1	Day 11	Day 13	Day 33	Day 34	Day 34	Day 34
AWIPS Convective Warming Fundamentals VLab & WEB exercises	Convective Storm Structure and Evolution & ILT*		AFun: Hazard Services	Flash Floods	Storm-Based Warming Fundamentals	Flash Flood Applied Performance Drills	Flash Flood & Storm-Based Warming Fund. ILT*	Workshop Severe Primer**	Workshop***
	Topic	Webinar*	WEB exercises (cloud)	Topic	Topic	WEB exercises (cloud)	Webinar*	WEB exercises	
	20 hours	16 hours	2 hours	4 hours	3 hours	5.5 hours	4 hours	2 hours	2.5 hours
	Deadline	Deadline	Deadline	Deadline	Recommended completion by	Deadline	Deadline	Deadline (due 17Z)	40 hours
Day 76	Day 83	Day 84	Day 86	Day 90	Day 99	Day 99	Day 100	Day 107	Day 110-114

*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 (16Z) 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.

- Ensure you have adequate training time built into your work schedule
- Monitor your progress to ensure you stay on pace
- Provide support and guidance

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.

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
- Set up “RAC in the Cloud” workstation two 27” monitors

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

STUDENT _____ DATE _____
EVALUATOR _____ TEST SCORE **100%**

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 OBB 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 they have made their final attempt prior to you.

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.

The facilitator also needs to work with local IT to set up the two 27” monitors to the local machine identified to be the “RAC in the Cloud” workstation.

RAC Web Page

<https://training.weather.gov/wdtd/courses/rac/>

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

WARNING DECISION TRAINING DIVISION
NOAA / NATIONAL WEATHER SERVICE

WDTD HOME MAIN COURSES TRAINING INFO TRAINING TOOLS SUPPORT INFO NEWS SEARCH ABOUT

Local Forecast by ZIP, ST, or ZIP code
Enter location [Go]
Location Help

Radar & Applications Course News

The Radar & Applications Course has begun offering courses that start at multiple times during the fiscal year to better accommodate new NWS employees. If you have a newly hired forecaster in your forecast office who you want to sign up for the next available RAC, please complete the [RAC Registration Form](#). **Note:** Local training facilitators (e.g., SOCs) **must** complete this form to register their students for RAC.

If you have any questions please contact Robert.A.Pentecost@noaa.gov

No Residence Courses are scheduled through December 31st

The Radar & Applications Course (RAC) Warning Decision Training Division FY21
Warning Decision Training Division
Office of Chief Learning Officer

[Weather.gov](#) > [Chief Learning Officer Training Portal](#) > [Warning Decision Training Division](#) > [Courses](#) > [RAC](#)

How to Register?

The Radar & Applications Course has begun offering courses that start at multiple times during the fiscal year to better accommodate new NWS employees. If you have a newly hired forecaster in your forecast office who you want to sign up for the next available RAC, please complete the [RAC Registration Form](#). **Note:** Local training facilitators (e.g., SOCs) **must** complete this form to register their students for RAC.

If you have any questions please contact Robert.A.Pentecost@noaa.gov

Residence & Virtual Courses

Course Description

The Radar & Applications Course provides initial training on the use of the WSR-88D Radar. The primary purpose of the RAC is to train NWS forecasters (meteorologists and hydrologists) on the use of the radar in the forecast and warning decision making process. The course covers Doppler radar theory, technological aspects of the WSR-88D as it is used in AWIPS, management of the data stream via the Radar Product Generator (RPG), the infusion of science and application of conceptual models, and the development of methodologies for use in an operational setting.

The RAC was initially taught as a 3 1/2 week residence course in Norman, Oklahoma, from 1950 to 1997. The current format is a blended learning approach including on-line modules, instructor-led webinars, and a 1-week workshop delivered at its conclusion in Norman. The course is very comprehensive and involves around 116 hours of material over the span of about 6 months.

RAC Pages

Here are some important links to other RAC pages:

- [Course Outline](#)
- [Course Support](#)
- [Webinar Registration Information](#)

Web-Based Training Release Dates

Follow WDTD on Facebook Follow NWSTC on Facebook Follow NWSTC on YouTube NWS RSS Feed

USA.gov
U.S. Dept of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Office of Chief Learning Officer
Web Master's Email: WDTD@noaa.gov

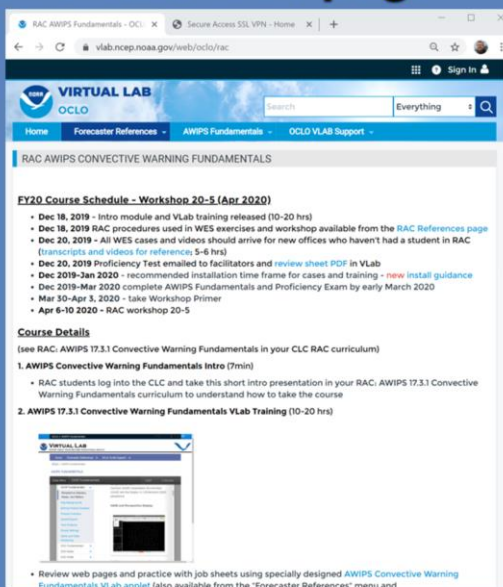
Customer Information Quality Help Glossary
Privacy Policy
Freedom of Information Act (FOIA)
About Us
Career Opportunities

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.

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



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.

RAC Support

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



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.

Questions?



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.