

# AMS Research:

*From Poster to Classroom*



Presenting Author:

Danny Mattox

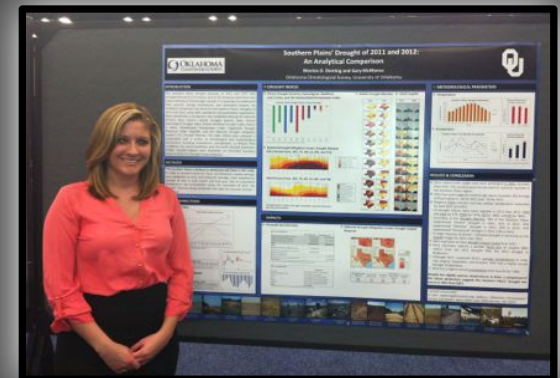
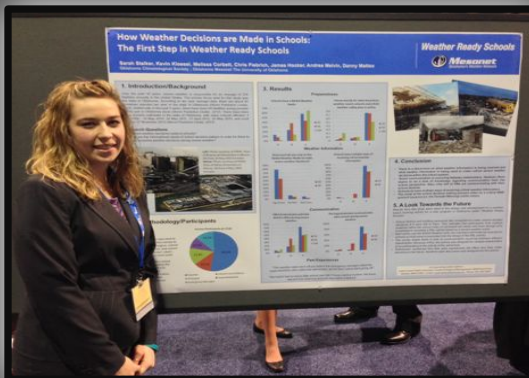
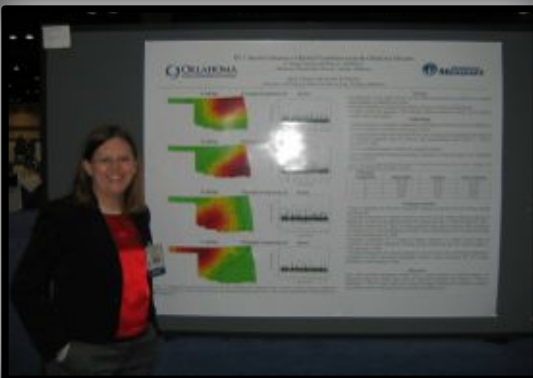
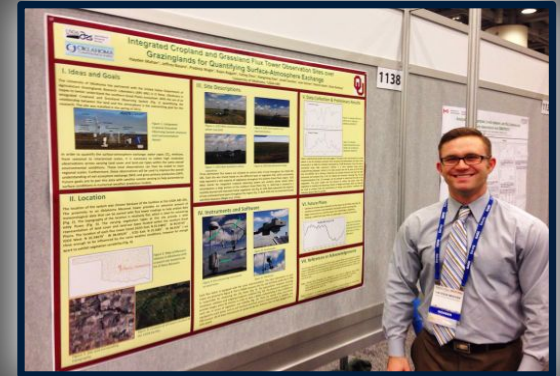
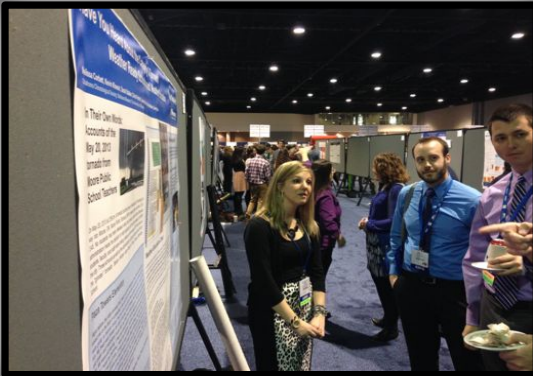
Oklahoma Climatological Survey

Norman Public Schools

AMS Annual Meeting in Phoenix, AZ

5 Jan 2015

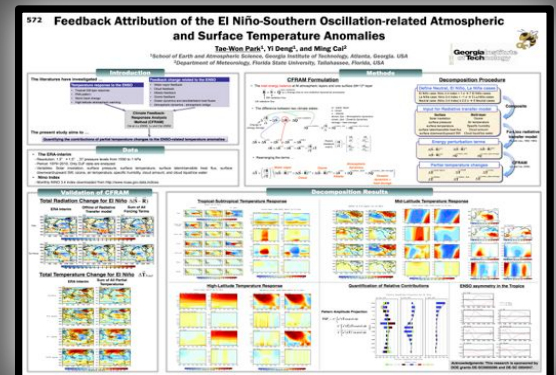
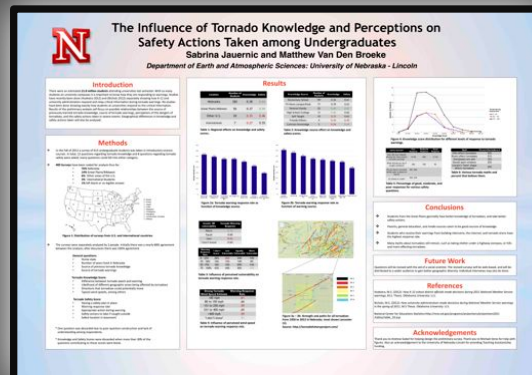
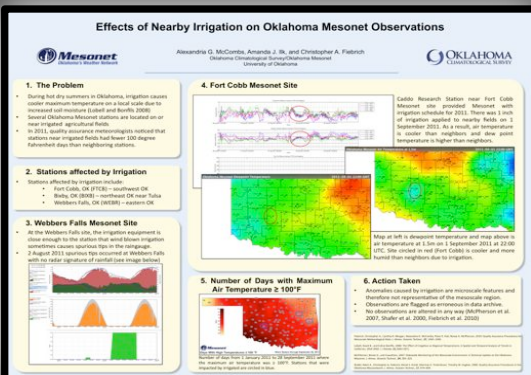
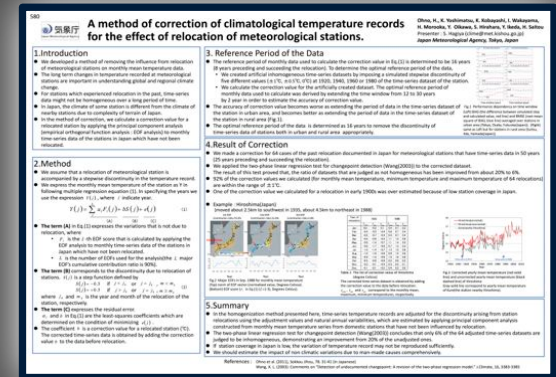
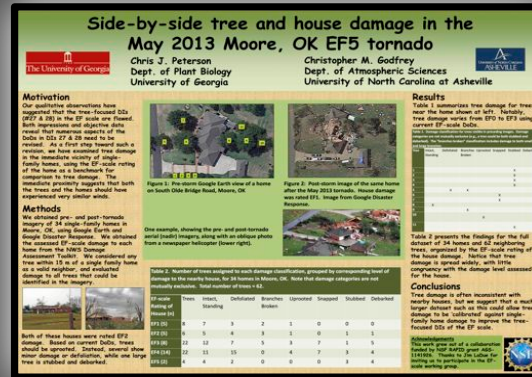
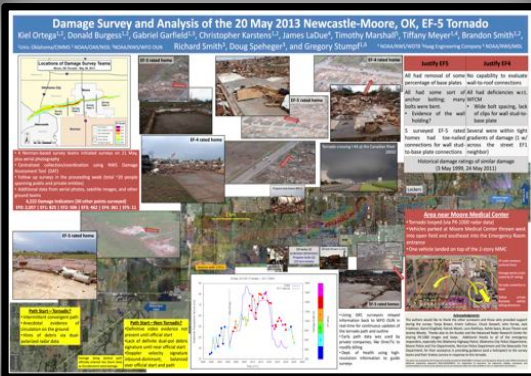
**Each year at the annual AMS meeting, a wealth of current research is presented in the poster hall.**



**Most of this research is unknown outside of the weather community in attendance at AMS.**

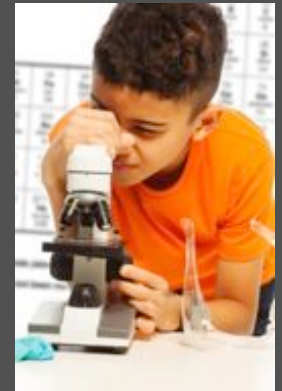


**What happens when these posters and the information they contain are rolled up and sealed back in their tubes?**



**Many posters and their data are never heard from again.**

Often students perceive science class as a stagnate subject area whose basic concepts were discovered long ago.

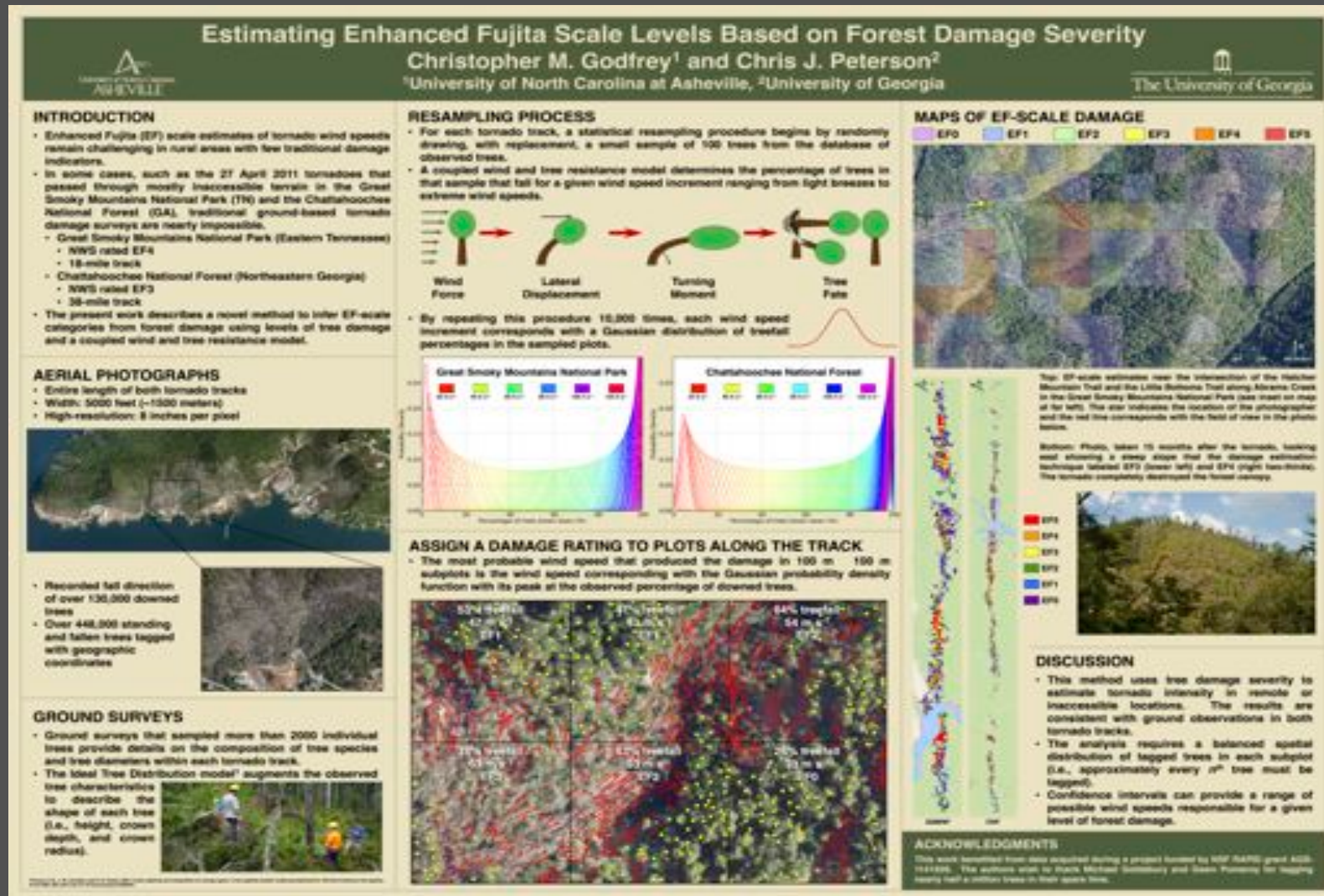


$$\begin{aligned} F &= ma \\ p &= mv \\ L &= I\omega \\ \Delta U &= Q - W \end{aligned}$$

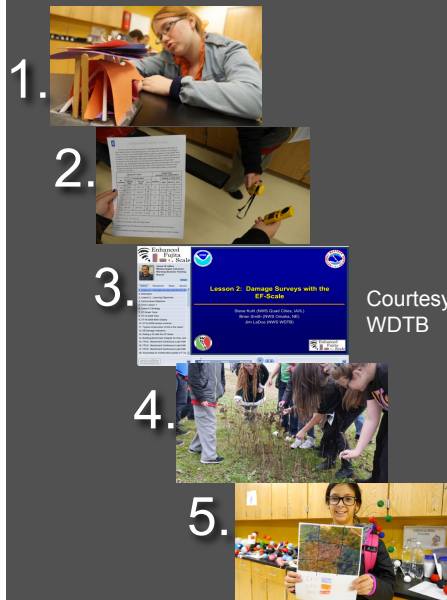
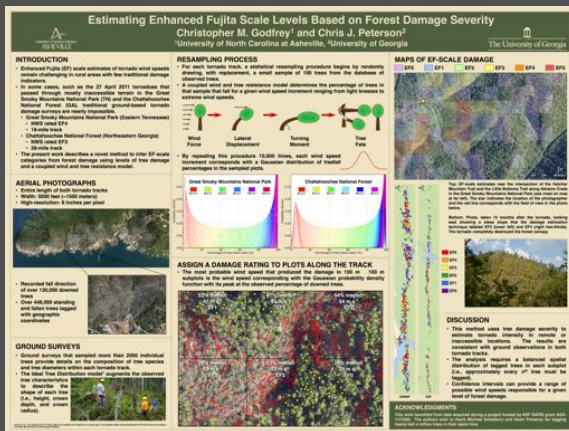
Posters portray science as an ongoing pursuit and expose students to new avenues of learning.



# Proof of Concept: From AMS in Atlanta, GA

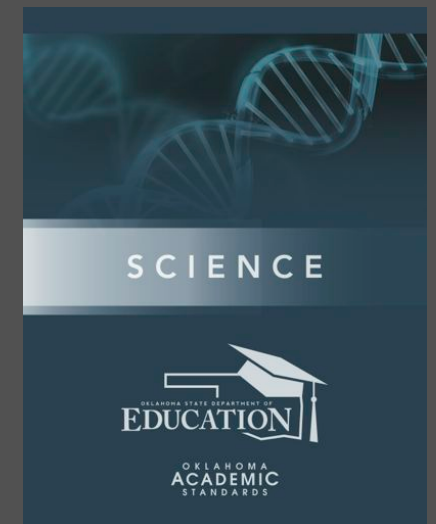


# To IMS in Norman, OK (Irving Middle School)



## 5e Learning Cycle

1. Engage
2. Explore
3. Explain
4. Elaborate
5. Evaluate





# The Standards



The *Next Generation Science Standards (NGSS)* developed by teachers, scientists, and leaders in science and science education from around the country, focus on the big ideas in science and emphasizes the common practices that scientists use every day, such as planning investigations, developing models, and designing solutions. The NGSS encourage students to learn the processes of science in a deep, meaningful way through firsthand investigative experiences, instead of just memorizing facts for a test. This scientific way of thinking will ensure that the concepts children learn in school will stay with them not just for a day, a week, or a year—but for a lifetime.

Courtesy: <http://ngss.nsta.org/parent-q-and-a/>

**NGSS were not adopted in Oklahoma, but the Oklahoma Academic Standards for Science are very similar.**



## What Oklahoma Academic Standards Do

- Do focus on deep thinking, conceptual understanding, and real-world problem solving skills
- Do set expectations for students to be College, Career, and Citizenship ready
- Do incorporate literacy in Science, Social Studies, and Technical Subjects
- Do emphasize the use of citations and examples from texts when creating opinions and arguments
- Do increase rigor and grade-level expectations
- Do determine the full range of support for English Language Learners and Students with Special needs.

## What Oklahoma Academic Standards Do Not

- Do Not dictate how teachers should teach
- Do Not mandate a specific curriculum
- Do Not limit advanced work beyond the standards
- Do Not require the purchase or development of entirely new instructional materials
- Do Not prescribe all that can or should be taught
- Do Not limit efforts to prepare students for College, Career, and Citizenship readiness
- Do Not prescribe interventions for students below grade-level

Were Not written or funded by the Federal Government. Oklahoma educators and content specialists participated in the writing, review and feedback process of the Oklahoma Academic Standards.

Courtesy: <http://ok.gov/sde/oklahoma-academic-standards>



# Next Generation Science Standards covered on the Lesson Inspired by the Poster

**MS-ESS3-2. Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.** [Clarification Statement: Emphasis is on how some natural hazards, such as volcanic eruptions and severe weather, are preceded by phenomena that allow for reliable predictions, but others, such as earthquakes, occur suddenly and with no notice, and thus are not yet predictable. Examples of natural hazards can be taken from interior processes (such as earthquakes and volcanic eruptions), surface processes (such as mass wasting and tsunamis), or severe weather events (such as hurricanes, tornadoes, and floods). Examples of data can include the locations, magnitudes, and frequencies of the natural hazards. Examples of technologies can be global (such as satellite systems to monitor hurricanes or forest fires) or local (such as building basements in tornado-prone regions or reservoirs to mitigate droughts).]

## Science and Engineering Practices

### Asking Questions and Defining Problems

Asking questions and defining problems in grades 6–8 builds on grades K–5 experiences and progresses to specifying relationships between variables, and clarifying arguments and models.

- Ask questions to identify and clarify evidence of an argument. (MS-ESS3-5)

### Analyzing and Interpreting Data

Analyzing data in 6–8 builds on K–5 and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.

- Analyze and interpret data to determine similarities and differences in findings. (MS-ESS3-2)

### Constructing Explanations and Designing Solutions

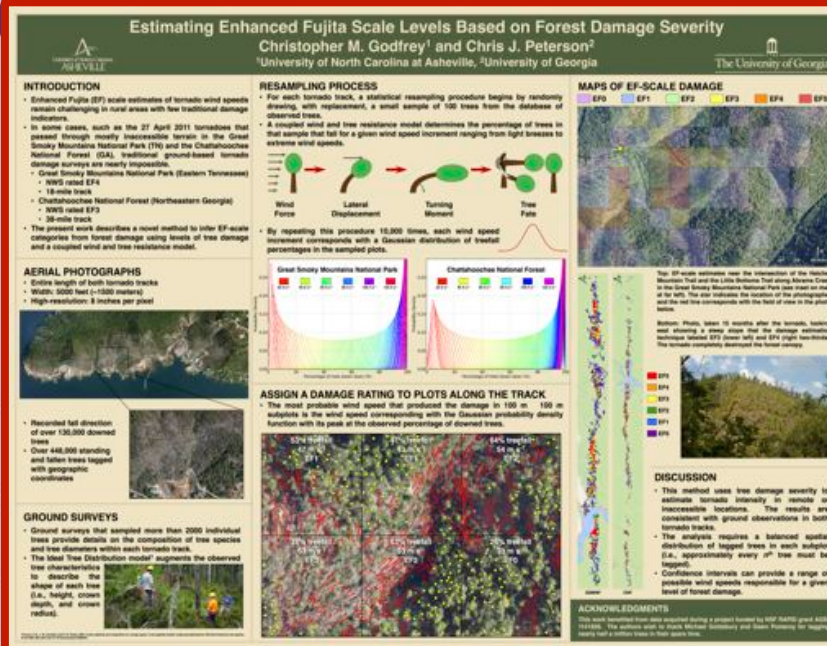
Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.

- Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (MS-ESS3-1)
- Apply scientific principles to design an object, tool, process or system. (MS-ESS3-3)

### Engaging in Argument from Evidence

Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).

- Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem. (MS-ESS3-4)



## Disciplinary Core Ideas

### ESS3.B: Natural Hazards

- Mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events. (MS-ESS3-2)

## Crosscutting Concepts

### Patterns

- Graphs, charts, and images can be used to identify patterns in data. (MS-ESS3-2)

### Cause and Effect

- Relationships can be classified as causal or correlational, and correlation does not necessarily imply causation. (MS-ESS3-3)
- Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-ESS3-1),(MS-ESS3-4)

### Stability and Change

- Stability might be disturbed either by sudden events or gradual changes that accumulate over time. (MS-ESS3-5)

## Connections to Engineering, Technology, and Applications of Science

### Influence of Science, Engineering, and Technology on Society and the Natural World

- All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. (MS-ESS3-1),(MS-ESS3-4)
- The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus technology use varies from region to region and over time. (MS-ESS3-2),(MS-ESS3-3)

## Connections to Nature of Science

### Science Addresses Questions About the Natural and Material World

- Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes. (MS-ESS3-4)



# Oklahoma Academic Standards for Science covered on the Lesson Inspired by the Poster

K-2	7TH GRADE	
	MS-ESS2-5 Earth's Systems	
	<p><b>Science &amp; Engineering Practices</b></p> <ul style="list-style-type: none"> <li>1 Asking questions (for science) and defining problems (for engineering)</li> <li>2 Developing and using models</li> <li>3 Planning and carrying out investigations <ul style="list-style-type: none"> <li>Planning and carrying out investigations in 6-8 builds on K-5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or solutions.</li> <li>Collect data to produce data to serve as the basis for evidence to answer scientific questions or test design solutions under a range of conditions.</li> </ul> </li> <li>4 Analyzing and interpreting data</li> <li>5 Using mathematics and computational thinking</li> <li>6 Constructing explanations (for science) and designing solutions (for engineering)</li> <li>7 Engaging in argument from evidence</li> <li>8 Obtaining, evaluating, and communicating information</li> </ul>	<p><b>Disciplinary Core Ideas</b></p> <p><b>Weather and Climate:</b></p> <ul style="list-style-type: none"> <li>Because these patterns are so complex, weather can only be predicted probabilistically.</li> <li>Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns.</li> <li>The ocean exerts a major influence on weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents.</li> </ul>
3-5	<p><b>Performance Expectations</b></p> <p><b>MS-ESS2-5</b> Students who demonstrate understanding can:</p> <p><b>Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.</b></p> <p><b>Clarification Statement:</b> Emphasis is on how air masses flow from regions of high pressure to low pressure, causing weather (defined by temperature, pressure, humidity, precipitation, and wind) at a fixed location to change over time, and how sudden changes in weather can result when different air masses collide. Emphasis is on how weather can be predicted within probabilistic ranges. Examples of data can be provided to students (such as weather maps, diagrams, and visualizations) or obtained through laboratory experiments (such as with condensation).</p> <p><b>Assessment Boundary:</b> Assessment does not include recalling the names of cloud types or weather symbols used on weather maps or the reported diagrams from weather stations.</p>	
6-8	<p><b>Crosscutting Concepts: Cause and Effect</b></p> <ul style="list-style-type: none"> <li>Cause and effect relationships may be used to predict phenomena in natural or designed systems.</li> </ul>	
9-12	Oklahoma Academic Standards Connections	
	<p><b>ELA/Literacy</b></p> <p><b>RST.6-8.1</b> Cite specific textual evidence to support analysis of science and technical texts.</p> <p><b>RST.6-8.7</b> Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).</p> <p><b>WHST.6-8.8</b> Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.</p>	<p><b>Mathematics</b></p> <p><b>MP.2</b> Reason abstractly and quantitatively.</p> <p><b>6.NS.C.5</b> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p>
<p><small>*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.</small></p>		
<p>118 SCIENCE STANDARDS • OKLAHOMA STATE DEPARTMENT OF EDUCATION</p>		

# Engage:

## Gulf Coast Contractor “Hurricane Houses”

**Task: Build a domicile with material and time constraints while keeping in mind the natural hazards of the gulf region.**



### ACTIVITY HURRICANE HOUSES

#### DESCRIPTION:

Students will learn what features of design and types of building materials make a house more weather resistant. Students will build a house that will survive hurricane force winds.

#### MATERIALS:

2 standard size sheets of construction paper  
4 straws (with or without flexible bend - it only matters that all students have the same type) - or 4 popsicle sticks  
glue stick  
60 cm cellophane (Scotch) tape  
Styrofoam tray turned upside down (The produce department of a local grocery store might donate fruit/vegetable trays. The tray is to be used for the base only. It cannot be cut apart and used for the house.)

Tools: supply scissors, metric ruler (markers are optional)

The size or kind of materials may vary. The most important factor is that ALL teams have the same materials. The purpose is to judge design. If every team has the same materials then design is the ONLY variable. An extension activity is to change materials (See below).

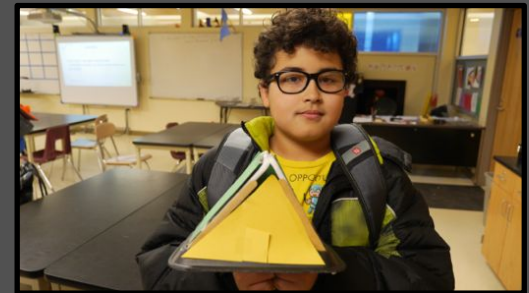
#### BACKGROUND:

- 1) Begin by teaching the essentials of weather and specifically of hurricanes.
- 2) Review Volume and Surface Area: Surface area is the sum of the area of each side (exclude bottom of house). (Optional)

The surface area will be used for comparison after the houses are tested by the “hurricane force” winds. Did the surface area affect the success of house to withstand the winds?

Give students samples of each shape and have them calculate surface area and volume. The amount of time needed will depend how their previous experience.

- 3) Use a leaf blower to “blow away the houses.”



Activity developed by Dr. Kevin Kloesel



# Engage: Gulf Coast Contractor “Hurricane Houses”

Analyze: Did your home make it? Why or why not? Identify designs that are better-suited for the potential hazards.

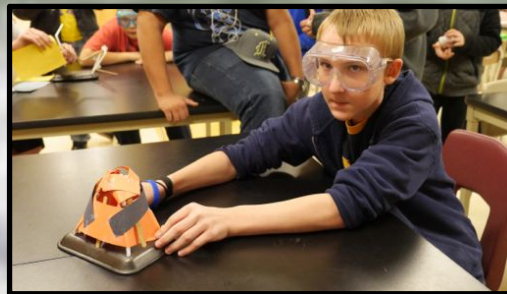
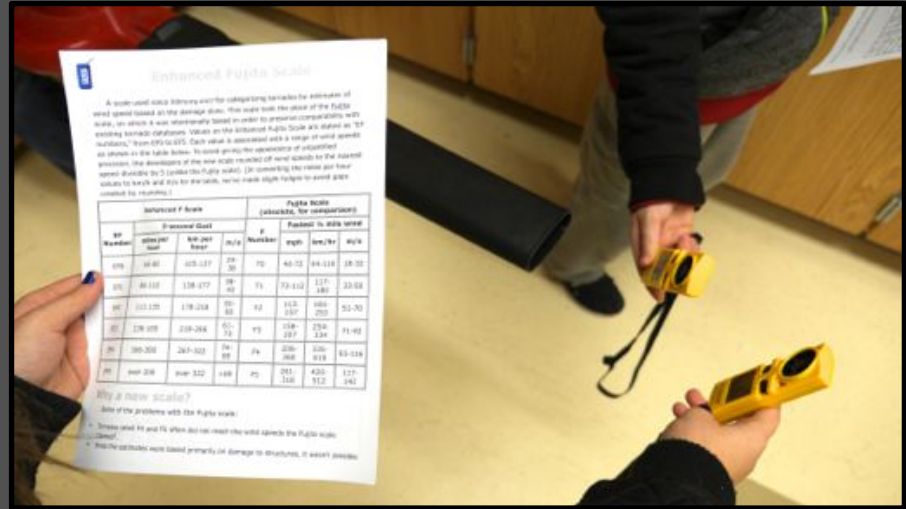
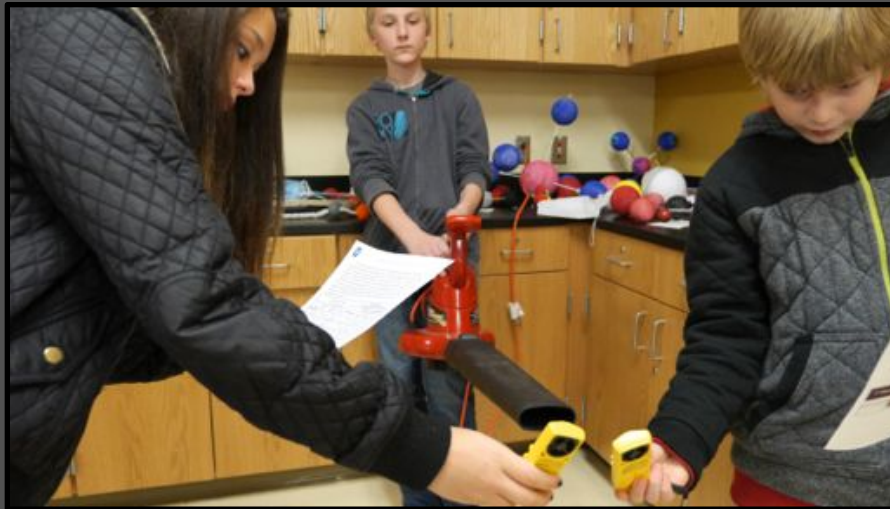


Image Courtesy:  
<http://www.noaanews.noaa.gov/stories2005/images/ivan091504-1515zb.jpg>

# Explore: What do tornadic and hurricane force winds feel like?

Task: Measure and classify wind speeds.



Enhanced F Scale				Fujita Scale (obsolete, for comparison)			
EF Number	2-minute Gust		mi/s	# Number	Peakish 1-minute Gust		mi/s
	min per hr	mi per hr			min per hr	mi per hr	
00	65-79	105-137	29-30	01	80-89	141-159	35-36
01	80-89	138-177	38-43	02	90-99	172-189	40-43
02	90-99	178-218	48-53	03	100-109	213-234	48-50
03	100-109	219-266	61-73	04	110-119	254-276	51-53
04	120-129	267-321	69-77	05	130-139	305-339	61-63
05	140-149	322-389	88-97	06	150-159	346-389	69-73
06	160-169	390-481	108-118	07	170-179	427-489	80-83
07	180-189	482-581	138-148	08	190-199	528-599	91-93
08	190-199	582-700	168-178	09	200-209	600-711	101-103
09	210-219	701-846	208-218	10	220-229	722-846	111-113
10	220-229	847-1000	248-258	11	230-239	847-1000	121-123
11	240-249	1001-1174	288-298	12	240-249	1001-1174	121-123
12	250-259	1175-1379	328-338	13	250-259	1175-1379	121-123
13	260-269	1380-1619	368-378	14	260-269	1380-1619	121-123
14	270-279	1620-1900	408-418	15	270-279	1620-1900	121-123
15	280-289	1901-2224	448-458	16	280-289	1901-2224	121-123
16	290-299	2225-2600	488-498	17	290-299	2225-2600	121-123
17	300-309	2601-3024	528-538	18	300-309	2601-3024	121-123
18	310-319	3025-3500	568-578	19	310-319	3025-3500	121-123
19	320-329	3501-4032	608-618	20	320-329	3501-4032	121-123
20	330-339	4033-4639	648-658	21	330-339	4033-4639	121-123
21	340-349	4640-5324	688-698	22	340-349	4640-5324	121-123
22	350-359	5325-6096	728-738	23	350-359	5325-6096	121-123
23	360-369	6097-6960	768-778	24	360-369	6097-6960	121-123
24	370-379	6961-7936	808-818	25	370-379	6961-7936	121-123
25	380-389	7937-9024	848-858	26	380-389	7937-9024	121-123
26	390-399	9025-10240	888-898	27	390-399	9025-10240	121-123
27	400-409	10241-11584	928-938	28	400-409	10241-11584	121-123
28	410-419	11585-13168	968-978	29	410-419	11585-13168	121-123
29	420-429	13169-14992	1008-1018	30	420-429	13169-14992	121-123
30	430-439	14993-17056	1048-1058	31	430-439	14993-17056	121-123
31	440-449	17057-19376	1088-1098	32	440-449	17057-19376	121-123
32	450-459	19377-21960	1128-1138	33	450-459	19377-21960	121-123
33	460-469	21961-24816	1168-1178	34	460-469	21961-24816	121-123
34	470-479	24817-27952	1208-1218	35	470-479	24817-27952	121-123
35	480-489	27953-31376	1248-1258	36	480-489	27953-31376	121-123
36	490-499	31377-35096	1288-1298	37	490-499	31377-35096	121-123
37	500-509	35097-39120	1328-1338	38	500-509	35097-39120	121-123
38	510-519	39121-43456	1368-1378	39	510-519	39121-43456	121-123
39	520-529	43457-48112	1408-1418	40	520-529	43457-48112	121-123
40	530-539	48113-53096	1448-1458	41	530-539	48113-53096	121-123
41	540-549	53097-58416	1488-1498	42	540-549	53097-58416	121-123
42	550-559	58417-64072	1528-1538	43	550-559	58417-64072	121-123
43	560-569	64073-70176	1568-1578	44	560-569	64073-70176	121-123
44	570-579	70177-76720	1608-1618	45	570-579	70177-76720	121-123
45	580-589	76721-83712	1648-1658	46	580-589	76721-83712	121-123
46	590-599	83713-91168	1688-1698	47	590-599	83713-91168	121-123
47	600-609	91169-99096	1728-1738	48	600-609	91169-99096	121-123
48	610-619	99097-107504	1768-1778	49	610-619	99097-107504	121-123
49	620-629	107505-116512	1808-1818	50	620-629	107505-116512	121-123
50	630-639	116513-126128	1848-1858	51	630-639	116513-126128	121-123
51	640-649	126129-136368	1888-1898	52	640-649	126129-136368	121-123
52	650-659	136369-147232	1928-1938	53	650-659	136369-147232	121-123
53	660-669	147233-158720	1968-1978	54	660-669	147233-158720	121-123
54	670-679	158721-170848	2008-2018	55	670-679	158721-170848	121-123
55	680-689	170849-183616	2048-2058	56	680-689	170849-183616	121-123
56	690-699	183617-197024	2088-2098	57	690-699	183617-197024	121-123
57	700-709	197025-211072	2128-2138	58	700-709	197025-211072	121-123
58	710-719	211073-225872	2168-2178	59	710-719	211073-225872	121-123
59	720-729	225873-241424	2208-2218	60	720-729	225873-241424	121-123
60	730-739	241425-257736	2248-2258	61	730-739	241425-257736	121-123
61	740-749	257737-274912	2288-2298	62	740-749	257737-274912	121-123
62	750-759	274913-292960	2328-2338	63	750-759	274913-292960	121-123
63	760-769	292961-311888	2368-2378	64	760-769	292961-311888	121-123
64	770-779	311889-331704	2408-2418	65	770-779	311889-331704	121-123
65	780-789	331705-352416	2448-2458	66	780-789	331705-352416	121-123
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71	840-849	469585-495744	2688-2698	72	840-849	469585-495744	121-123
72	850-859	495745-522816	2728-2738	73	850-859	495745-522816	121-123
73	860-869	522817-550800	2768-2778	74	860-869	522817-550800	121-123
74	870-879	550801-579712	2808-2818	75	870-879	550801-579712	121-123
75	880-889	579713-609552	2848-2858	76	880-889	579713-609552	121-123
76	890-899	609553-640320	2888-2898	77	890-899	609553-640320	121-123
77	900-909	640321-672016	2928-2938	78	900-909	640321-672016	121-123
78	910-919	672017-704640	2968-2978	79	910-919	672017-704640	121-123
79	920-929	704641-738192	3008-3018	80	920-929	704641-738192	121-123
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81	940-949	772673-808080	3088-3098	82	940-949	772673-808080	121-123
82	950-959	808081-844416	3128-3138	83	950-959	808081-844416	121-123
83	960-969	844417-881680	3168-3178	84	960-969	844417-881680	121-123
84	970-979	881681-919872	3208-3218	85	970-979	881681-919872	121-123
85	980-989	919873-958992	3248-3258	86	980-989	919873-958992	121-123
86	990-999	958993-999136	3288-3298	87	990-999	958993-999136	121-123
87	1000-1009	999137-1040208	3328-3338	88	1000-1009	999137-1040208	121-123
88	1010-1019	1040209-1081920	3368-3378	89	1010-1019	1040209-1081920	121-123
89	1020-1029	1081921-1124368	3408-3418	90	1020-1029	1081921-1124368	121-123
90	1030-1039	1124369-1167552	3448-3458	91	1030-1039	1124369-1167552	121-123
91	1040-1049	1167553-1211472	3488-3498	92	1040-1049	1167553-1211472	121-123
92	1050-1059	1211473-1256128	3528-3538	93	1050-1059	1211473-1256128	121-123
93	1060-1069	1256129-1301520	3568-3578	94	1060-1069	1256129-1301520	121-123
94	1070-1079	1301521-1347648	3608-3618	95	1070-1079	1301521-1347648	121-123
95	1080-1089	1347649-1394512	3648-3658	96	1080-1089	1347649-1394512	121-123
96	1090-1099	1394513-1442112	3688-3698	97	1090-1099	1394513-1442112	121-123
97	1100-1109	1442113-1490448	3728-3738	98	1100-1109	1442113-1490448	121-123
98	1110-1119	1490449-1539520	3768-3778	99	1110-1119	1490449-1539520	121-123
99	1120-1129	1539521-1589328	3808-3818	100	1120-1129	1539521-1589328	121-123
100	1130-1139	1589329-1639872	3848-3858	101	1130-1139	1589329-1639872	121-123
101	1140-1149	1639873-1691152	3888-3898	102	1140-1149	1639873-1691152	121-123
102	1150-1159	1691153-1743168	3928-3938	103	1150-1159	1691153-1743168	121-123
103	1160-1169	1743169-1795920	3968-3978	104	1160-1169	1743169-1795920	121-123
104	1170-1179	1795921-1849408	4008-4018	105	1170-1179	1795921-1849408	121-123
105	1180-1189	1849409-1903632	4048-4058	106	1180-1189	1849409-1903632	121-123
106	1190-1199	1903633-1958592	4088-4098	107	1190-1199	1903633-1958592	121-123
107	1200-1209	1958593-2014288	4128-4138	108	1200-1209	1958593-2014288	121-123
108	1210-1219	2014289-2070720	4168-4178	109	1210-1219	2014289-2070720	121-123
109	1220-1229	2070721-2127888	4208-4218	110	1220-1229	2070721-2127888	121-123
110	1230-1239	2127889-2185696	4248-4258	111	1230-1239	2127889-2185696	121-123
111	1240-1249	2185697-2244144	4288-4298	112	1240-1249	2185697-2244144	121-123
112	1250-1259	2244145-2303232	4328-4338	113	1250-1259	2244145-2303232	121-123
113	1260-1269	2303233-2362960	4368-4378	114	1260-1269	2303233-2362960	121-123
114	1270-1279	2362961-2423328	4408-4418	115	1270-1279	2362961-2423328	121-123
115	1280-1289	2423329-2484336	4448-4458	116	1280-1289	2423329-2484336	121-123
116	1290-1299	2484337-2545984	4488-4498	117	1290-1299	2484337-2545984	121-123
117	1300-1309	2545985-2608272	4528-4538	118	1300-1309	2545985-2608272	121-123
118	1310-1319	2608273-2671200	4568-4578	119	1310-1319	2608273-2671200	121-123
119	13						



# Explain:

## How is tornado damage assessed?

Question: How are tornadoes rated based on damage surveys?  
What are damage indicators?

Task: Complete Warning Decision Training Branch module

The screenshot shows a presentation slide titled "Lesson 2: Damage Surveys with the EF-Scale". The slide is blue with yellow text. It features logos for NOAA, the National Weather Service, and the Enhanced Fujita Scale. The slide lists the names of the presenters: Steve Kuhl (NWS Quad Cities, IA/IL), Brian Smith (NWS Omaha, NE), and Jim LaDue (NWS WDTB). On the left side, there is a sidebar with a list of topics and a small profile picture of James G. LaDue, Meteorologist Instructor, Warning Decision Training Branch. The bottom of the slide shows a presentation control bar with "Slide 1 of 18" and "PAUSED".

**Enhanced Fujita Scale**

James G. LaDue  
Meteorologist Instructor,  
Warning Decision Training  
Branch

**Lesson 2: Damage Surveys with the EF-Scale**

Steve Kuhl (NWS Quad Cities, IA/IL)  
Brian Smith (NWS Omaha, NE)  
Jim LaDue (NWS WDTB)

**Enhanced Fujita Scale**

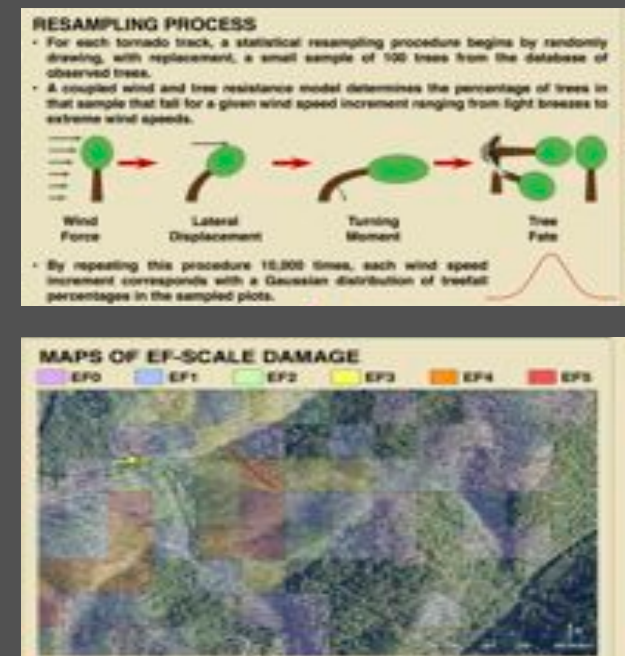
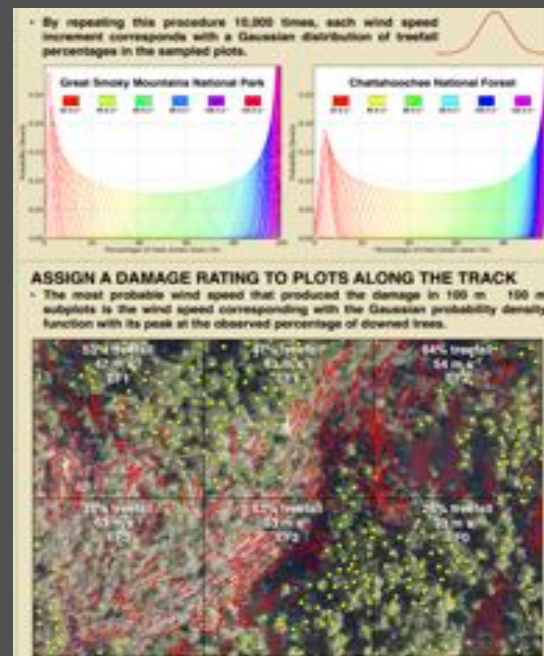
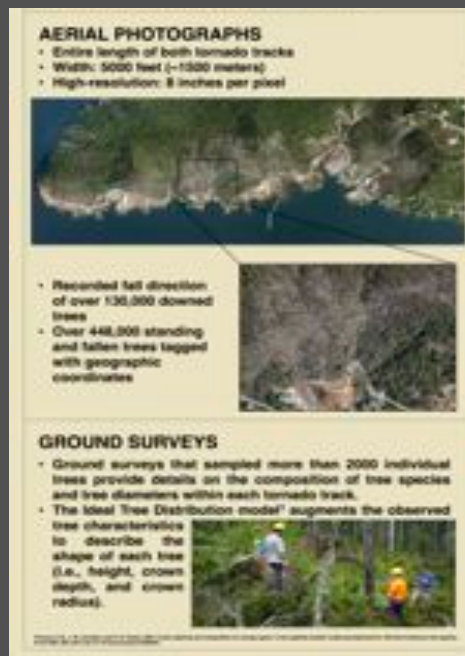
articulate  
POWERED PRESENTATION

SLIDE 1 OF 18 PAUSED 00:00 / 04:37

# Elaborate:

How might tornadoes that occur in inaccessible forests be rated if no damage survey can be conducted on the ground?

**Task: Design a model based on Godfrey and Peterson's findings presented in their poster.**





## Elaborate:

How might tornadoes that occur in inaccessible forests be rated if no damage survey can be conducted on the ground?

**Task: Design a model based on Godfrey and Peterson's findings presented in their poster.**



# Evaluate:

## Why was our classroom model not viable?

**Task: Infer tornado intensity based on the percentage of downed trees in a grid**





# Takeaway Message

1. **Widespread curriculum development is happening across the country due to the implementation of new standards.**
2. **Emphasis is put on emulating the scientific process rather than memorizing words and facts.**
3. **Now is the perfect time to integrate new meteorological research into lessons to add urgency and meaning to an otherwise static curriculum.**
4. **Partnerships between research scientists and K-12 educators to develop inquiry-based classroom lessons will result in a more engaging educational experience and will better prepare students for careers in science.**

# AMS Research:

*From Poster to Classroom*



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# Acknowledgements

Dr. Christopher M. Godfrey, University of North Carolina at Asheville

Dr. Chris J. Peterson, University of Georgia

Jeri Irby, Oklahoma Forestry Services

Scott Huff, Oklahoma Forestry Services

Marcum's Nursery, Oklahoma City

# Questions?



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