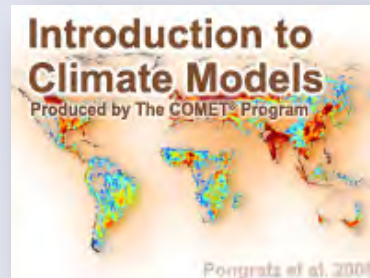


COMET Overview

July 2014



Annual budget: ~\$4.3 million (\$5.5-6 million for FY15)

Primary Sponsors: NOAA NESDIS, NOAA NWS, NOAA NOS, Bureau of Reclamation, US Navy NMOC, MSC Canada, EUMETSAT, BoM Australia, USACE

Staff of 24:

Subject matter experts (mets, nwp, hydrologists)

Instructional designers

Web and application developers

Graphic artists

Spanish translator/coordinator

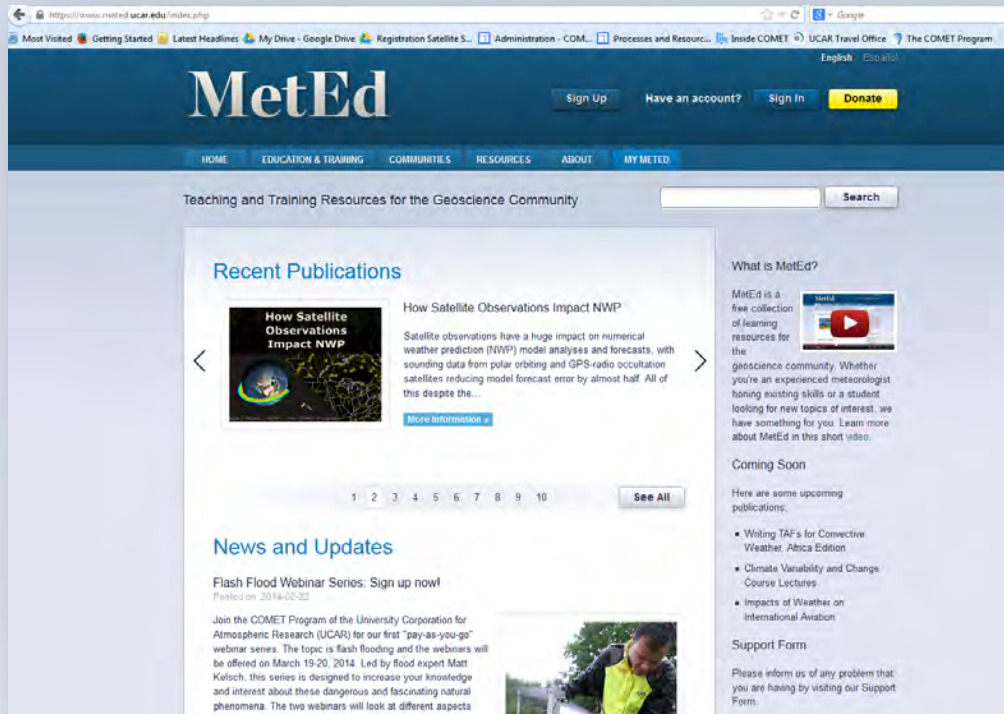
IT and administrative support staff



Dr. Richard Jeffries
Director and Principal Investigator



MetEd Website 2014



www.meted.ucar.edu

Online Lessons:

- ▶ 363 English, 111 Spanish, 38 French
- ▶ 750+ hours of self-directed distance learning material

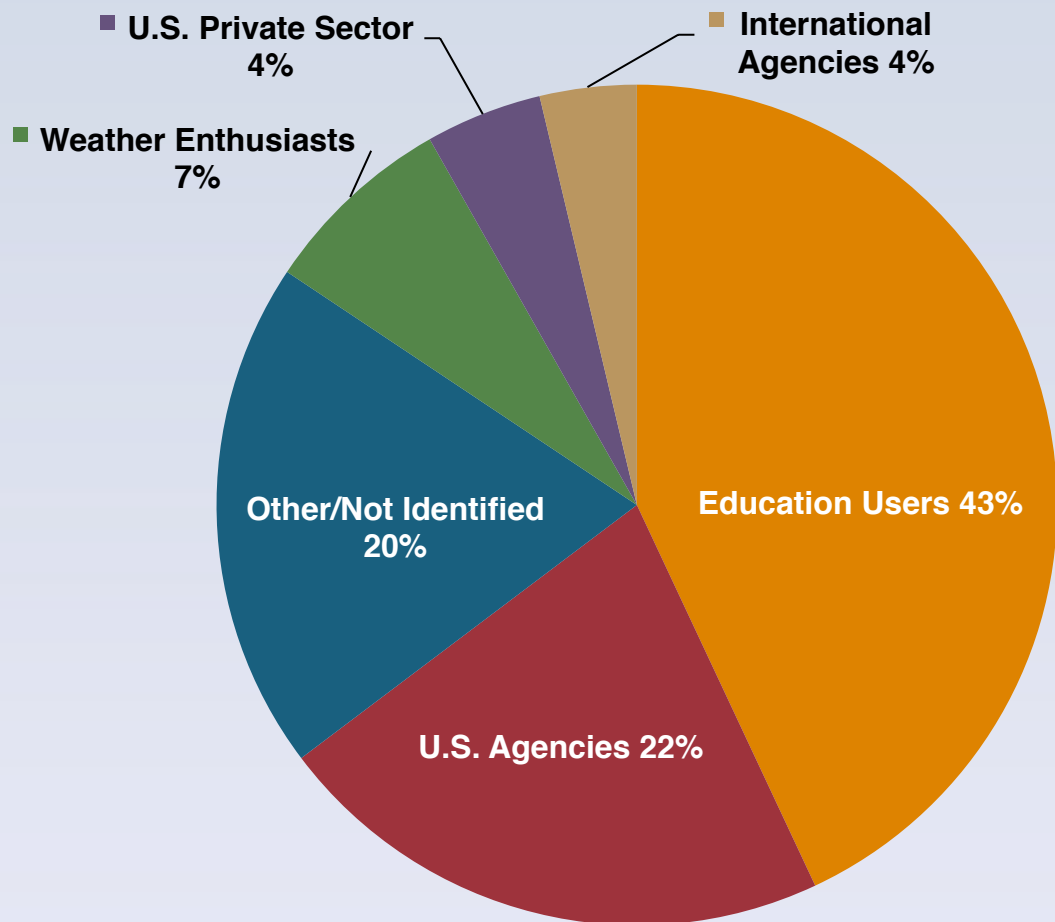
Registered Users:

- ▶ 340,000+ growing at 5,000-6,000 per month
- ▶ ~100,000 international, representing most national met services
- ▶ ~100,000 students representing 1,500+ universities

Since 2007/beginning of website registration:
over **1.3 million hours** of online sessions



Registered MetEd Users

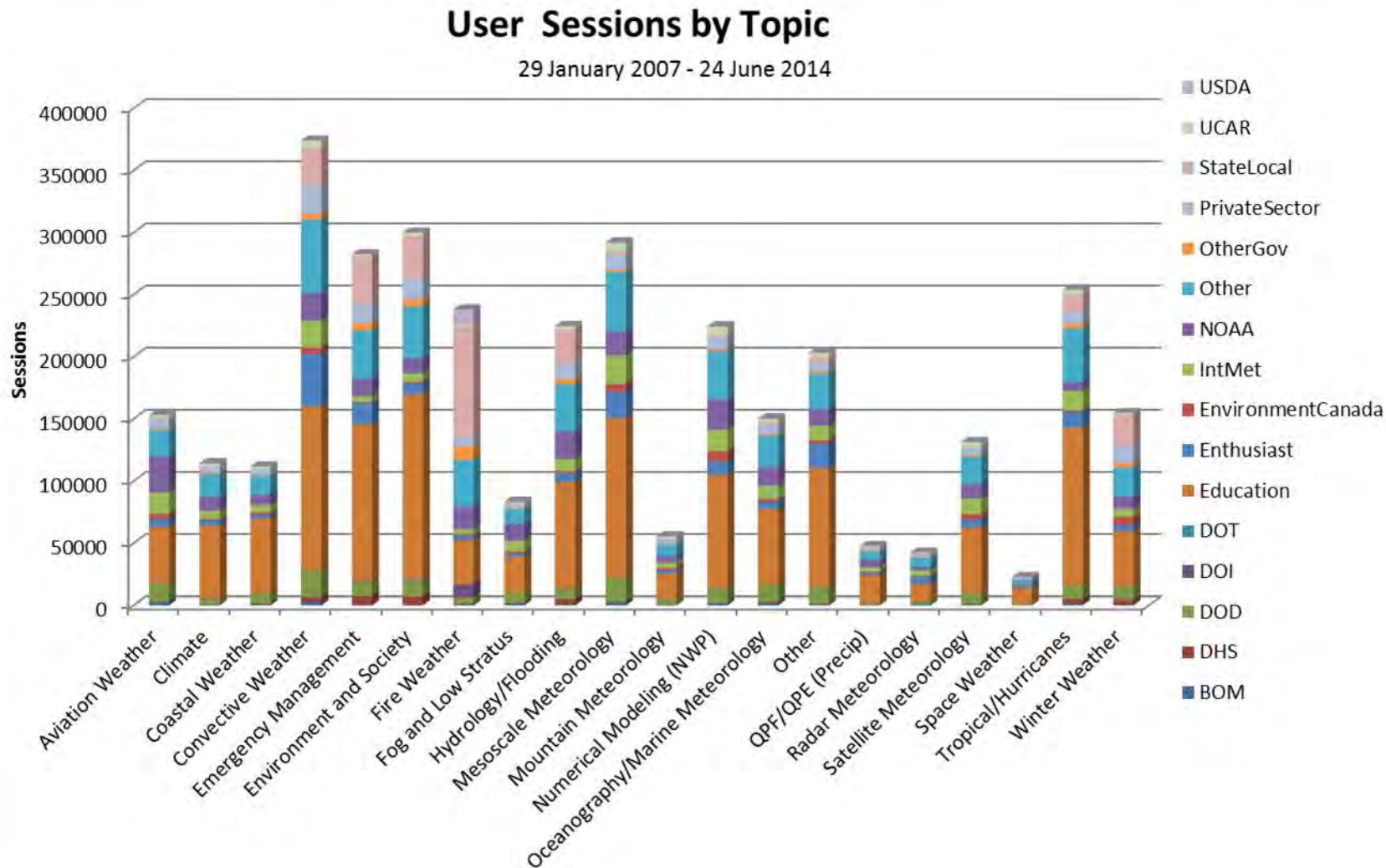


340,000+ registered users (May 2014)

- Education Users
- U.S. Agencies
- Other/Not Identified
- Weather Enthusiasts
- U.S. Private Sector
- International Agencies

*NOTE: a ~third of registered users are international, a ~quarter are Spanish speaking

Usage by Topic Area



Misc. Social Networking Stats



COMET/MetEd YouTube Channel:

- 57 videos
- 417 subscribers
- 47,611 videos viewed



COMETWx Flickr Group:

- 415 photos
- 72 members



COMET/MetEd Facebook Group:

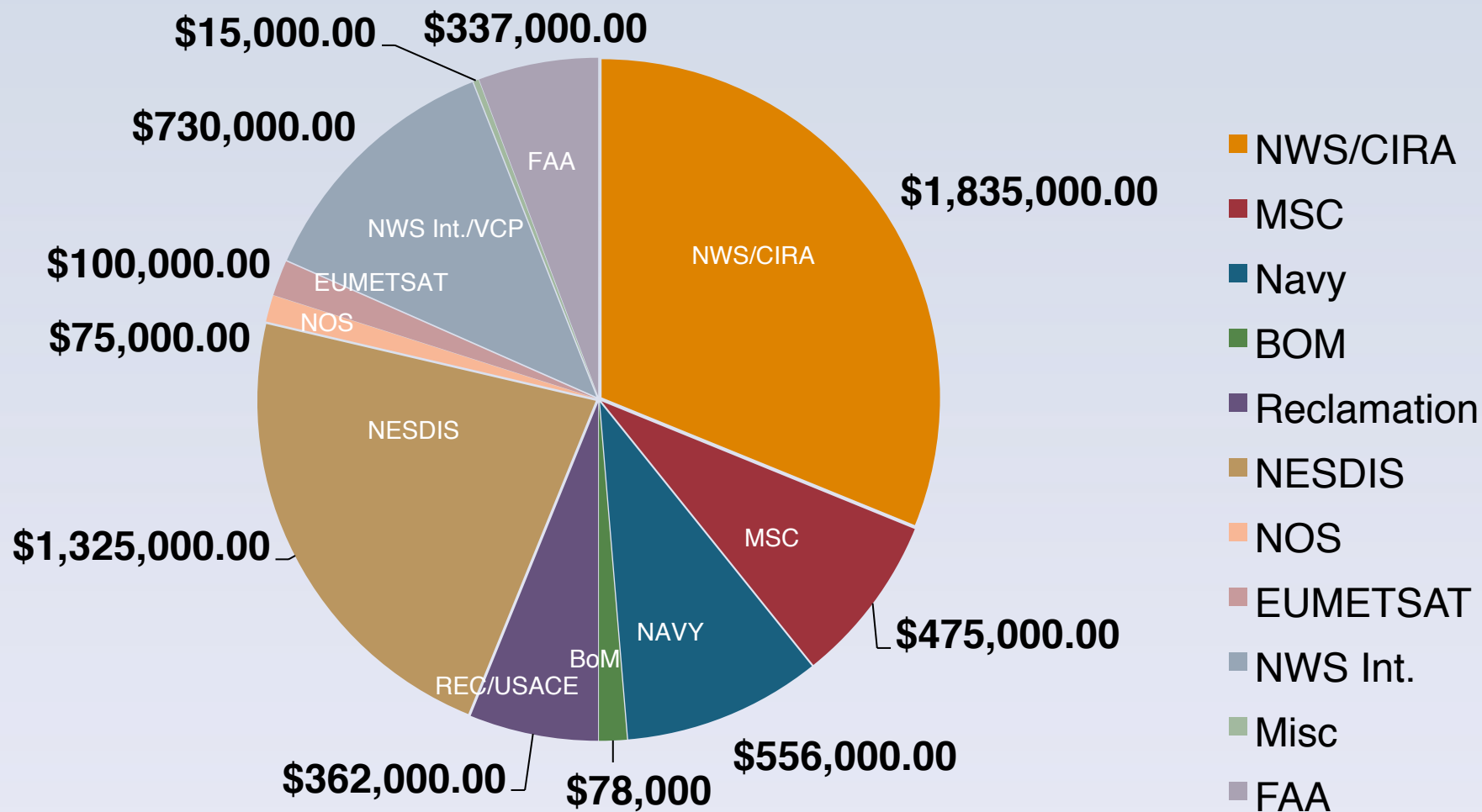
- 2690+ members
- New members joining daily
- Daily postings by members



AddThis Sharing Widget

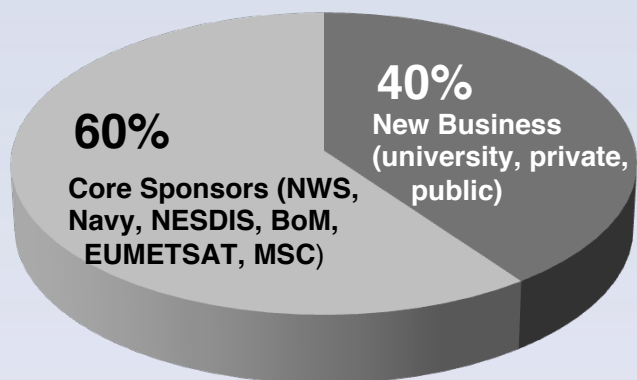
- Added to MetEd lesson description pages 22 Oct 2013
- 3,064 shares leading to 10,830 clicks to content

Funding Sources By Sponsor

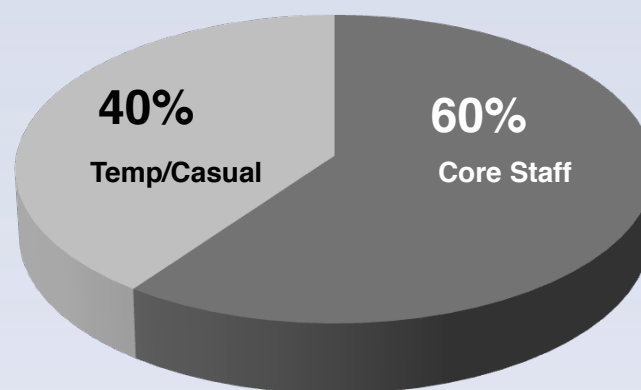


Funding and Staffing Goals

Funding

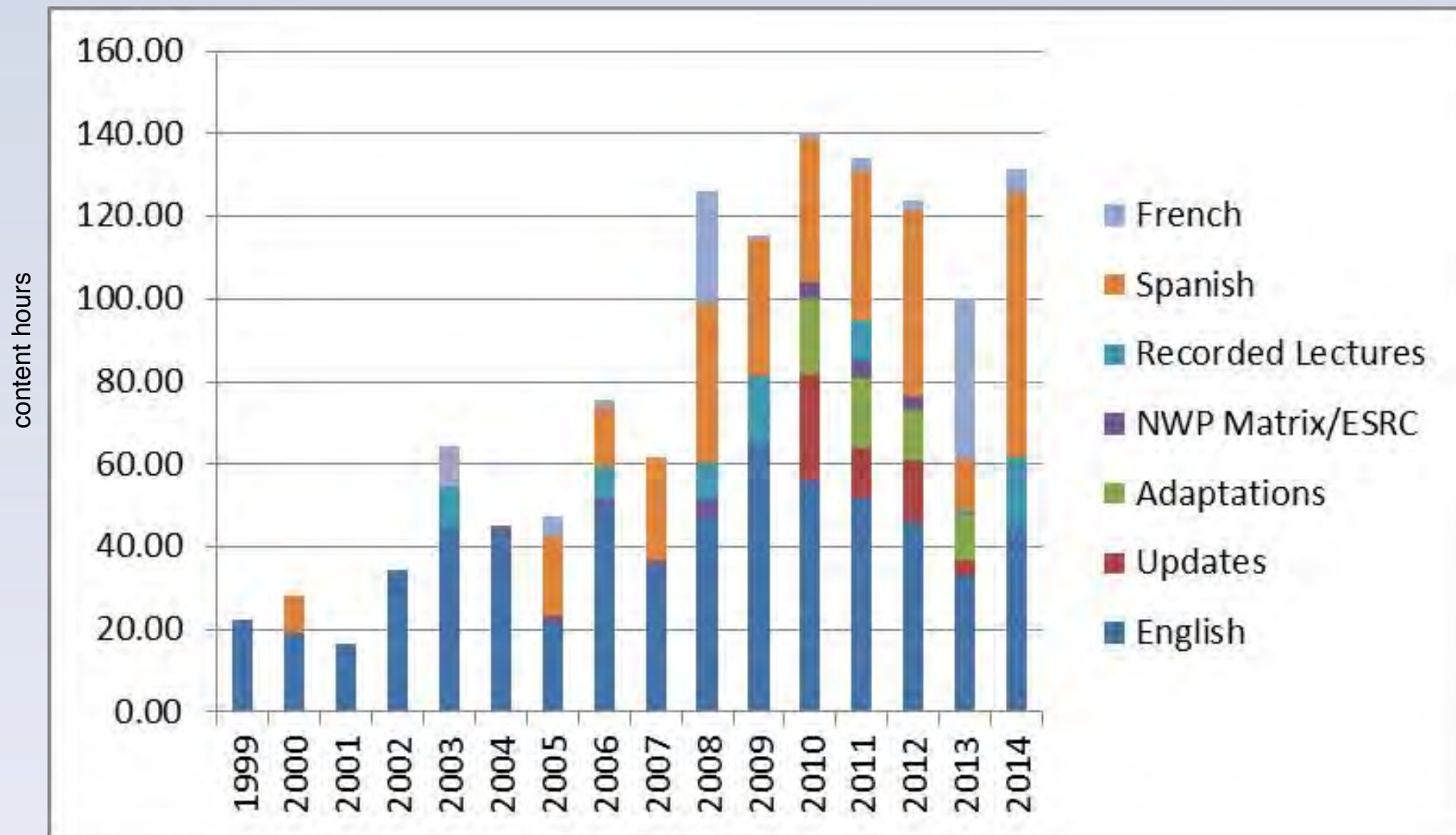


Staffing



FY14 Accomplishments and FY15 Plans

Content Development Trends





Integrated Sensor Training

FY14

Current/Completed projects:

- Infusion of GEO and LEO data into all applicable lessons (NESDIS)
- GOES-R GLM lesson (NESDIS)
- How Satellite Data Inform NWP lesson (NESDIS)
- Complete Imaging with VIIRS, 3rd Edition (NESDIS)
- Update of Microwave Remote Sensing: Land and Ocean Surface Applications lesson (NESDIS)
- Facilitation of Satellite Proving Ground virtual events (NESDIS)
- Continued support of the ESRC (NESDIS)
- EUMeTrain resources added to the MetEd website: Synoptic Textbook and Manual of Synoptic Satellite Meteorology
- EUMETSAT Activities: 3 ASMET 7 Lessons, ASMET 1 Lesson on Basics of Visible and Infrared Remote Sensing, Initiated work on 4 ASMET 8 case studies (EUMETSAT)
- Satellite Feature Identification: Conveyor Belts (MSC)
- Electro-magnetic and Electro-optic Propagation lesson (Navy)

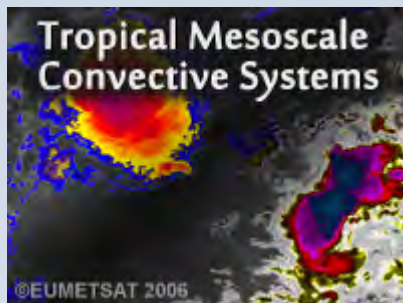


Integrated Sensor Training

FY15

Anticipated Projects:

- Satellite Feature Identification: Inferring Sensible Weather from Water Vapour Imagery (MSC)
- Satellite Feature Identification: Comparing Water Vapour Imagery to NWP (MSC)
- Videos supporting satellite, basic or NWP training (Topics TBD) (MSC)
- OMPS Sensor Overview video (Ball Aerospace)
- Scenario-based Himawari lessons in preparation for GOES-R ABI (NESDIS)
- GOES-R Space Weather lesson with SWPC (NESDIS)
- Update existing JPSS lessons based on sponsor priorities (NESDIS)
- Facilitate Satellite Proving Ground virtual conference (NESDIS)
- Initiate development of a lesson on the Polar Communication and Weather Satellite (NESDIS/MSC)
- EUMETSAT webcast (topic TBD) (EUMETSAT)
- Continued support of ESRC??? (NESDIS)



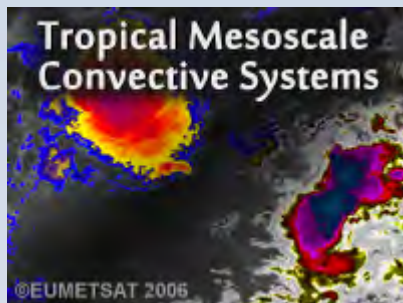
International

FY14

Current/Completed Projects:

- Spanish translations (NWS/IA)
- Tropical Synoptic Meteorology Course Package and Lessons(NWS/IA)
- Low-level support for Review of Aeronautical Meteorology Course for Caribbean (NWS/IA, WMO)
- Low-level support for WMO hydrologic science course (WMO)
- Adapted Volcanic Ash Training for international audience (NWS/IA)
- Began to develop interface to map WMO 1083 BIP-M learning outcomes on MetEd (NWS/IA)
- Support for NWS Pacific Desk Program (NWS/IA)
- Climate and Climatology Curriculum Package: Year 1 of 2 (NWS/IA)
- Critical Training for RA-V: Year 1 of 3 - RAM-DL for SIDS, Island Meteorology, Island Hydrology (NWS/IA)
- Ongoing support of CALMet and co-organizer for CALMet 2015, Seoul

* pending VCP funding



International

FY15	<p>Anticipated Projects:</p> <ul style="list-style-type: none">• Mountain Weather Course for Korean Meteorological Agency (KMA)• Spanish Translations of MetEd lessons (NWS/IA)• French Translations of MetEd lessons (in partnership with MSC)• Ongoing support of international hydrology courses (WMO)• Climate and Climatology Curriculum Package Year 2 (WMO)• Critical training for RA-V (NWS/IA)• Support for NWS Pacific Desk—Year 2 (NWS/IA)• SMN/Mexico Modernization: translations and course support (SMN/World Bank)• Ongoing support of CALMet
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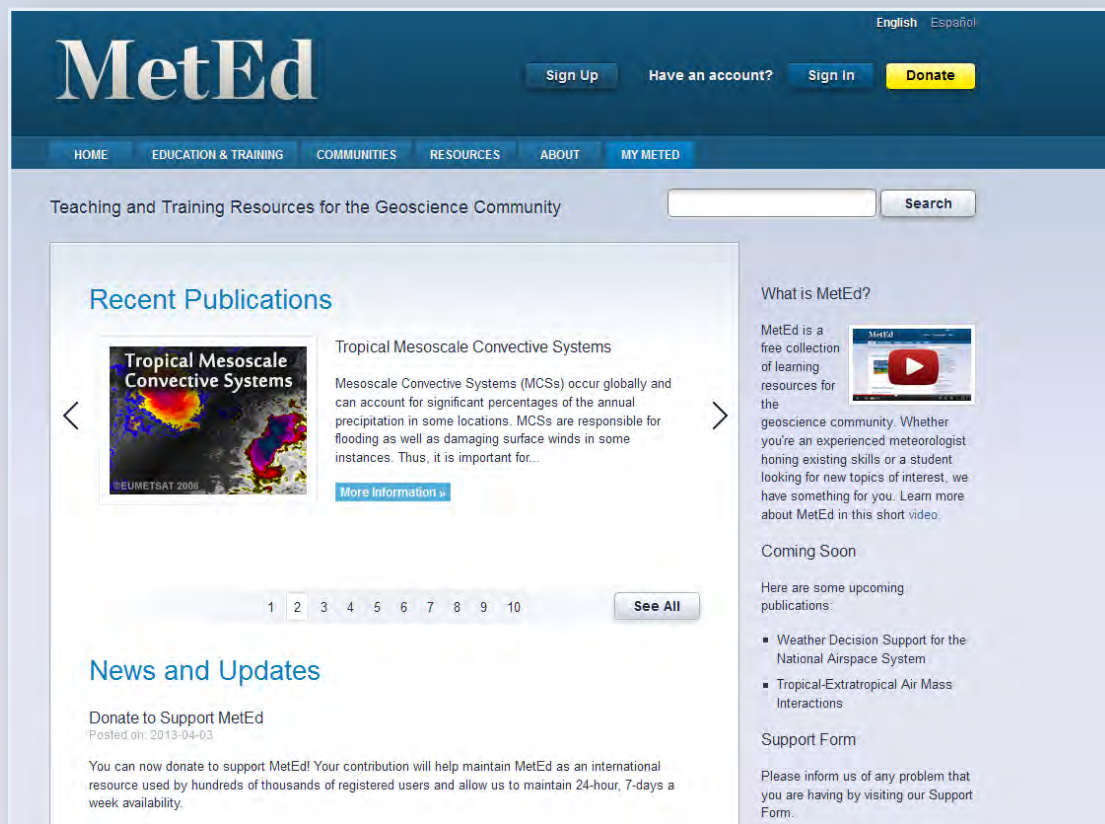
Strategic considerations in the works...

- ▶ Increase support for translations other than Spanish and MSC/French
- ▶ Increased use of MetEd content as part of blended and facilitated instruction
- ▶ Increase use of international examples/standards/units
- ▶ Write and develop for easy extensibility and adaptability
- ▶ Competency/standards/objectives mapping to content
- ▶ Development of search and tracking tools aligned to competencies (enhanced cataloging and metadata schema)
- ▶ Develop and share competency assessment frameworks
- ▶ Greater support for university/induction training programs (e.g. QGOE, Radiation Cooling Rates, Pressure Gradient Force)

End of VLab content

- Remainder of content is part of a larger presentation for COMET Executive Board

MetEd Upgrades

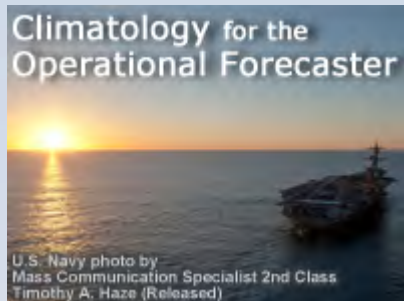


- Infrastructure created to allow donations
- Improved form-based support requests
- User ratings capabilities added
- Migration hardware replacement completed
- MetEd business continuity system established



Aviation

FY14	<p>Current/Completed Projects:</p> <ul style="list-style-type: none">• Major Revisions for DLAC 2: Writing TAFS for Convective Weather, 2nd Edition (NWS)• Minor Revisions for DLAC 2: Basic Terminal Forecast Strategies and Writing TAFS for for Winds and Low Level Wind Shear(NWS)• Aviation PDS team facilitation (NWS)• Completion of Review of Aeronautical Meteorology DL Course for Caribbean (NWS, WMO)
FY15	<p>Anticipated Projects:</p> <ul style="list-style-type: none">• Safe Skies for Africa Year Three (DOT)• Forecasting Cessation of Convection, Enroute Icing Hazards, and Enroute Turbulence (NWS)• Aircraft-based Observations and the WMO AMDAR Observing System (NWS)• 3-4 hours of content based on aviation PDS priorities (NWS)• Air Traffic Control Tower Observing (Navy)



Climate

FY14

Current/Completed projects:

- **Developed curriculum outlines for training on water temperature impacts, and sedimentation and river hydraulics(Reclamation)**
- **Water Temperature Impacts Under Climate Change Residence Course (Reclamation)**
- **Delivered Hydrologic Impacts Under Climate Change course in virtual format (Reclamation)**
- **Further business development leading to registration courses with CEUs (Reclamation)**
- **Pilot videos highlighting water resource professionals (Reclamation)**
- **Water Temperature Flyover (Reclamation)**
- **Two videos on the Climate and Hydrology Projections Archive site.**
- **Published recorded lectures from the August 2013 CVCVC**



Climate

FY15

Anticipated Projects:

- Continue to develop and deliver training in support of Assessing Climate Change Impacts on Natural Systems PDS (Reclamation)
- Continue development of business model to sustain education and training partnership (Reclamation)
- Develop new and update existing climate training lessons to support NOAA's climate decision support initiative (contingent on funding)



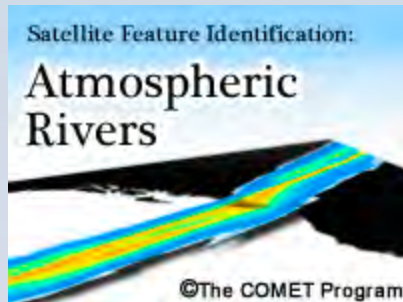
Dynamics

FY14	Current/Completed Projects: <ul style="list-style-type: none">Quasi-geostrophic Omega Equation Distance Learning Object (BoM-Australia)
FY15	Anticipated Projects: <ul style="list-style-type: none">Additional Dynamic Learning Objects (contingent on funding)



Emergency Management/ National Geodetic Survey

FY14	Current/Completed projects: <ul style="list-style-type: none">• Introduction to Observing Oil from Helicopters and Planes (NOS)• National Geodetic Survey lesson and videos on datums (NOS)
FY15	Anticipated Projects: <ul style="list-style-type: none">• Conversion of the Science of Oil Spills residence course to distance learning: Oil Spill Chemistry lesson (NOS)• Follow on to NGS datums lesson/videos, TBD (NOS)• Develop hydrography lesson (Navy and NOS)• Establish professional development series for other NOS programs (NOS)



Hydrology

FY 15

Anticipated Projects:

- **Development of training plans and materials in consultation with Reclamation and National Water Center partners (contingent on funding)**



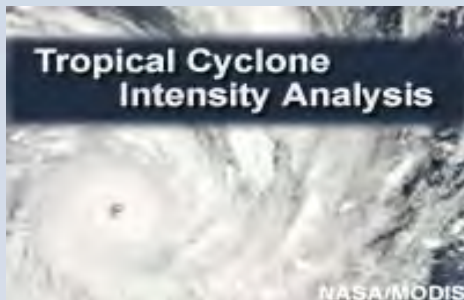
Numerical Weather Prediction

FY14	<p>Current/Completed projects:</p> <ul style="list-style-type: none">• Updates to the NWP Model Matrix (NWS-Sandy Supplemental)• Ensemble Applications in Winter (MSC)• <u>How Satellite Observations Impact NWP</u> (NESDIS)
FY15	<p>Anticipated Projects:</p> <ul style="list-style-type: none">• NWP Models Matrix Maintenance (NWS/Sandy Supplemental)• Develop training on Blended Numerical Guidance-4 lessons (NWS/Sandy Supplemental)• Complete 4 remaining lessons for NWP Course 3*• Publish just-in-time videos on new model upgrades and implementations* <p>*contingent on NWS funding</p>



Oceanography/Marine/ Arctic/Tsunami

FY14	<p>Current/Completed projects:</p> <ul style="list-style-type: none">• Weather Observing Fundamentals (Navy)• Update Understanding Marine Customers lesson (NWS)• Begin development of Incident Response and Decision Support Marine Weather Services lesson (NWS)• Updates to existing Tsunami lessons (NWS)• Begin development of Tsunami Ready lesson (NWS)• Begin development of Hydrographic Survey Operations lesson (Navy)
FY15	<p>Anticipated Projects:</p> <ul style="list-style-type: none">• Complete Hydrographic Survey Operations lesson (Navy)• Complete update on Understanding Marine Customers lesson (NWS)• Complete Incident Response and Decision Support Marine Weather Services lesson (NWS)• Complete tsunami lesson updates (NWS)• Complete Tsunami Ready lesson (NWS)• International Ice Patrol Observations lesson (Navy)



Tropical/Hurricane

FY14	<p>Current/Completed projects:</p> <ul style="list-style-type: none">• Development of the Introduction to Tropical Meteorology online textbook (NWS/IA)• Continued Spanish translation of tropical textbook (NWS/IA)• Being development of online storm surge lesson (NWS/Sandy)• Begin development of short, online lessons on tropical guidance interpretation, tropical winds and surge threat assessment and risk communication (NWS/Sandy)
FY15	<p>Anticipated Projects:</p> <ul style="list-style-type: none">• Complete development of Introduction to Tropical Meteorology online textbook (NWS/IA)• Complete development of Storm Surge lessons (NWS/Sandy)• Complete development of lessons on tropical guidance interpretation, tropical wind and surge threat assessment, and risk communication (NWS/Sandy)



Winter/Mountain Weather

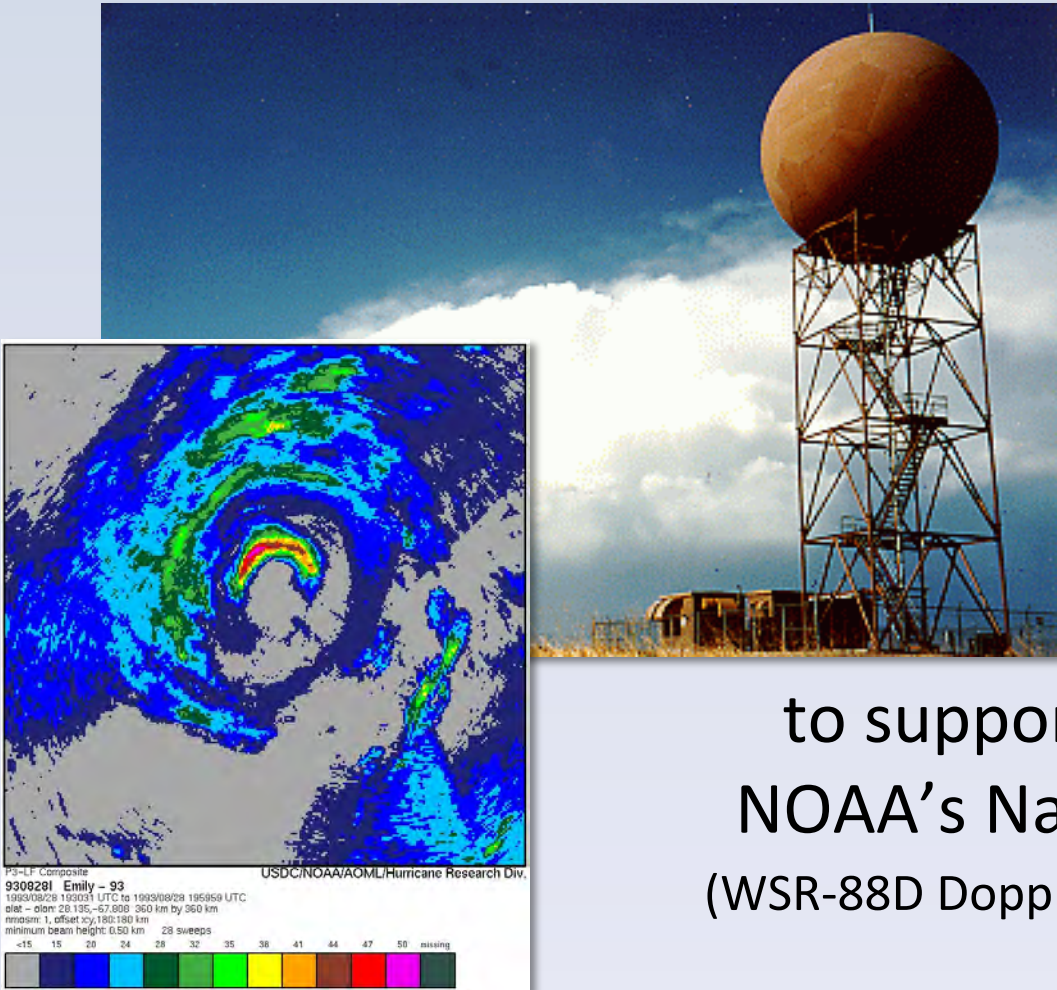
FY14	Current/Completed Projects: <ul style="list-style-type: none">• Winter Weather Course, Fall 2013 (MSC)• Development of KMA Mountain Weather Course (KMA)
FY15	Anticipated Projects: <ul style="list-style-type: none">• Winter Weather Course, Fall 2014 (MSC)• Mountain Weather Course, Fall 2014 (KMA)• Lake and River Ice lesson (Navy)• International Ice Patrol Observations lesson (Navy)



Other

FY14	Current/Completed Projects: <ul style="list-style-type: none">• AWIPS 2 Validation Effort—Year 1 (NWS)
FY15	Anticipated Projects: <ul style="list-style-type: none">• AWIPS 2 Validation Effort—Year 2 (NWS)• Celestial Navigation lesson (Navy)

The COMET Program

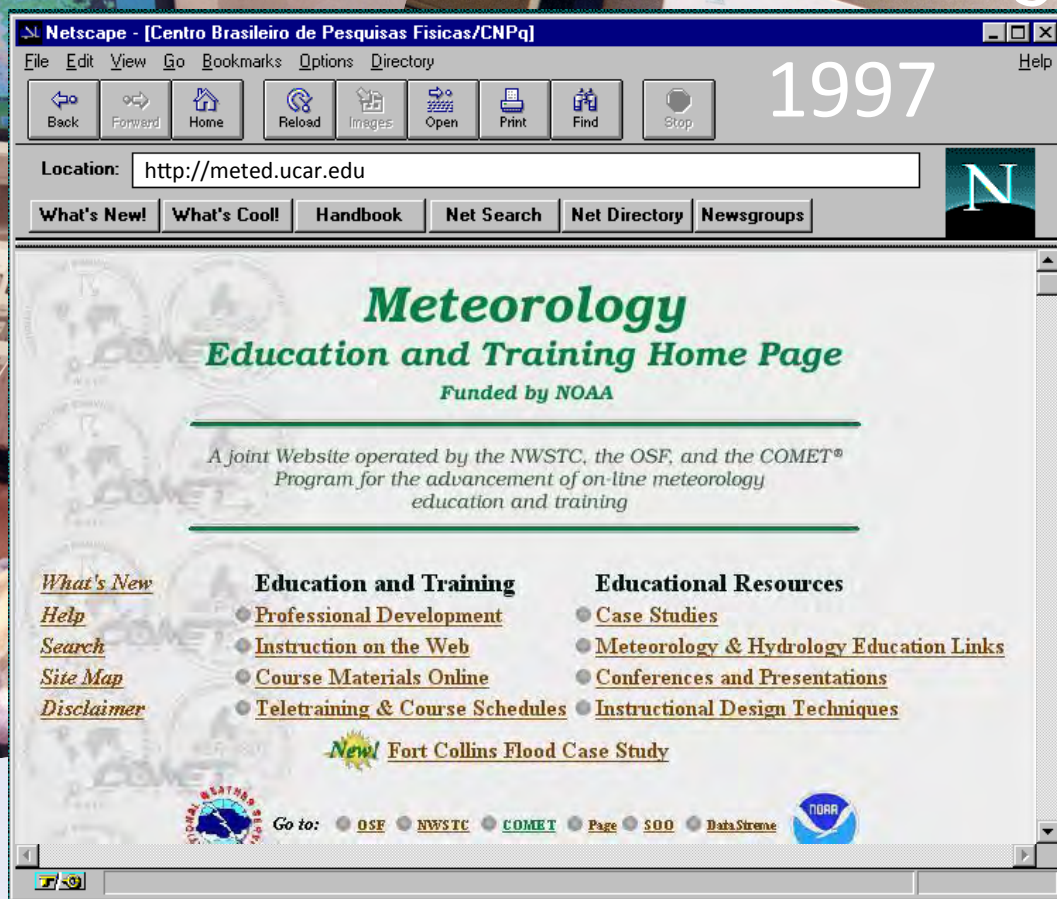


Created in 1990
to support the modernization of
NOAA's National Weather Service
(WSR-88D Doppler radar interpretation, forecast
processes, training assessment)

1992

1996

1997



Awards!



2004 Louis J. Battan Authors Award,
K-12 Category for
Hurricane Strike!™



2000 Hurricane Conference Outstanding
Achievement Award for Community
Hurricane Preparedness



2005 Honorable Mention in the non-
interactive media category of the
Science & Engineering Visualization
Challenge



For Polar Lows Ungava Bay
Case Study



American Geophysical Union
Excellence in Geophysical
Education Award 2006



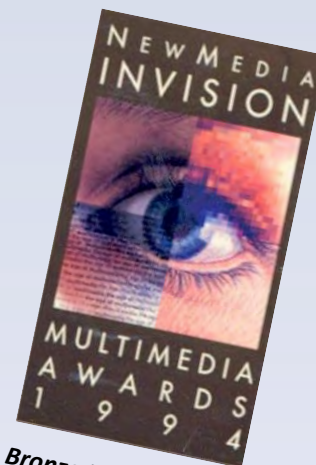
2009 National Weather Association
Public Education Award



2008 NSF and the
Journal Science
International Science & Engineering
Visualization Challenge: Semi-Finalist

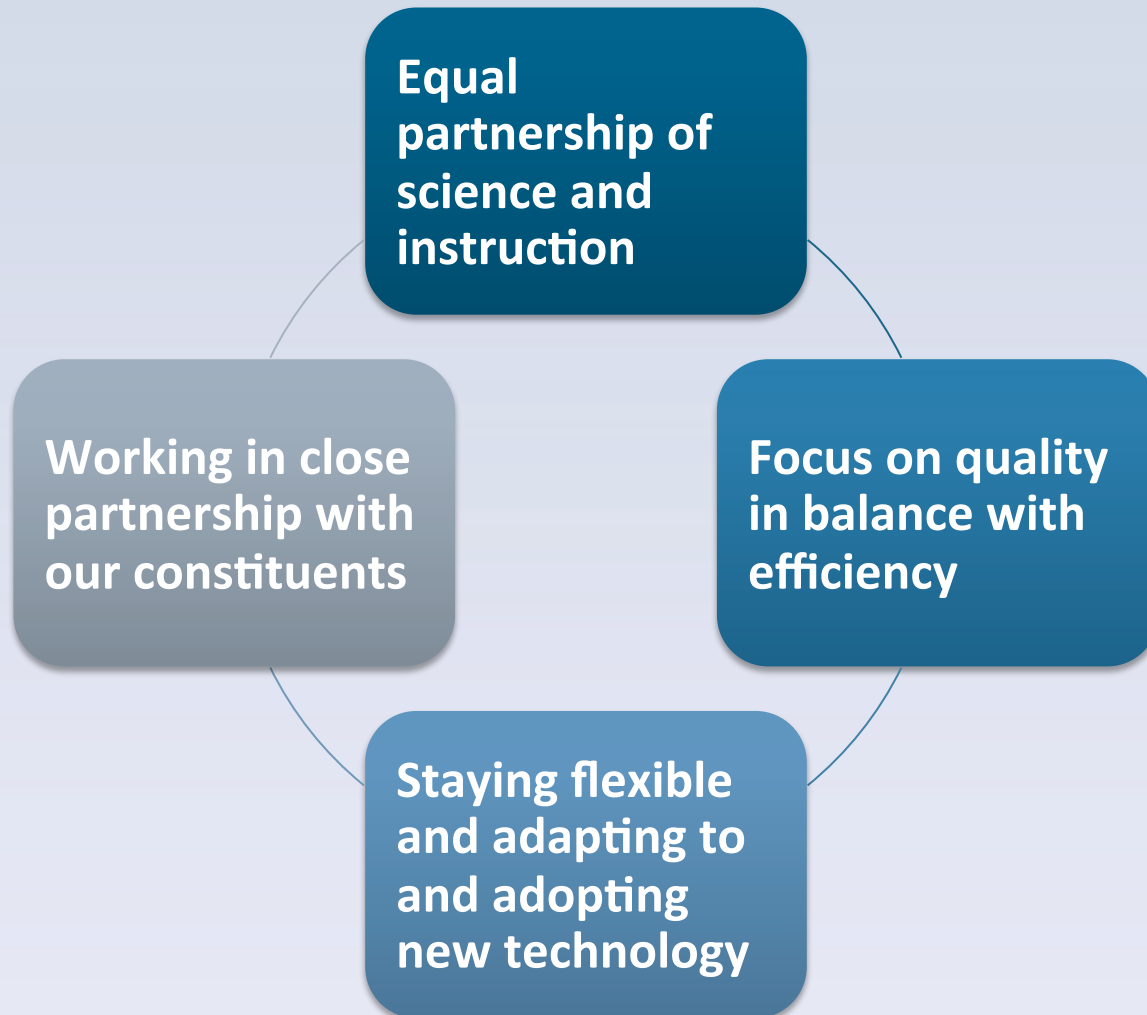


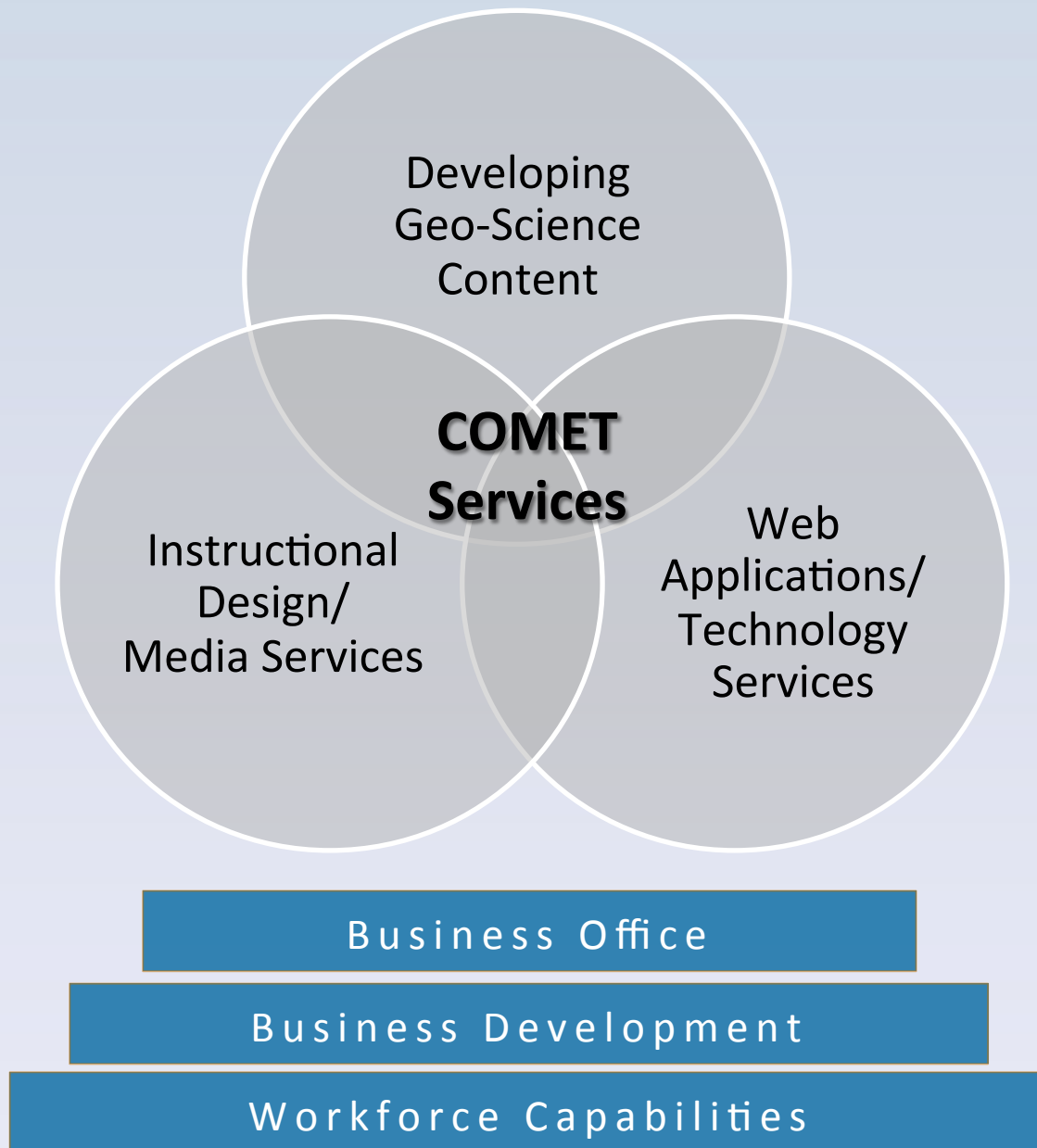
Finalist Recognition International
Science & Engineering Visualization
Challenge 2009



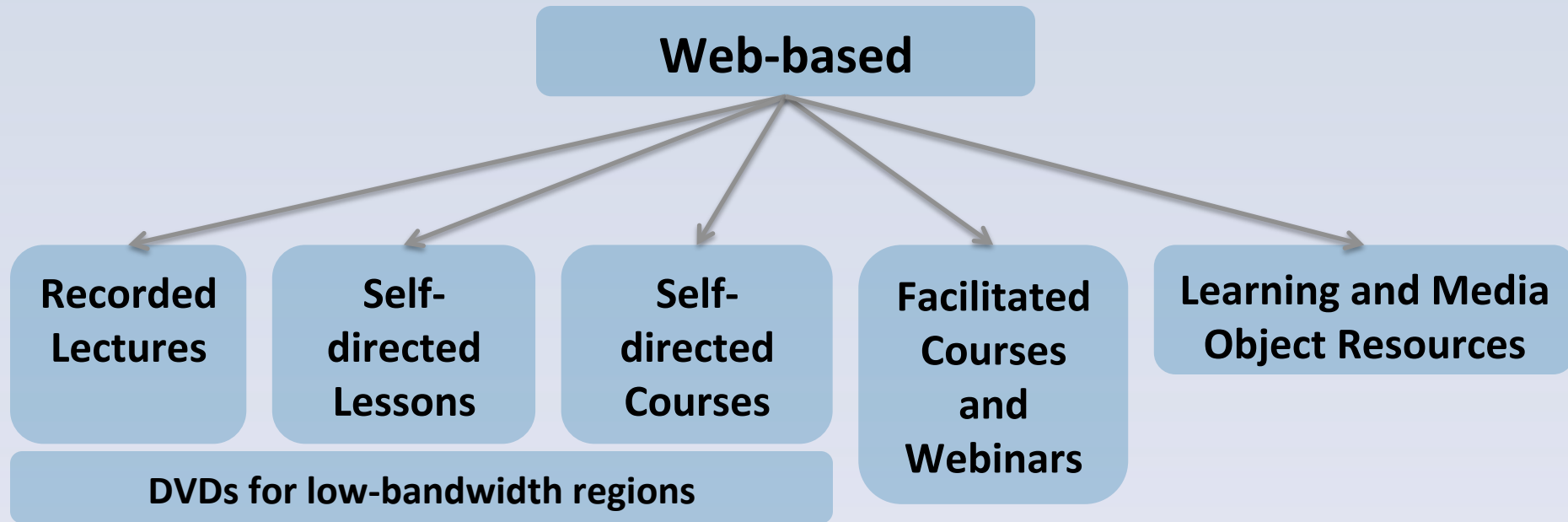
Bronze Medal for
Boundary
Detection &
Convection Initiation

Long-term Success



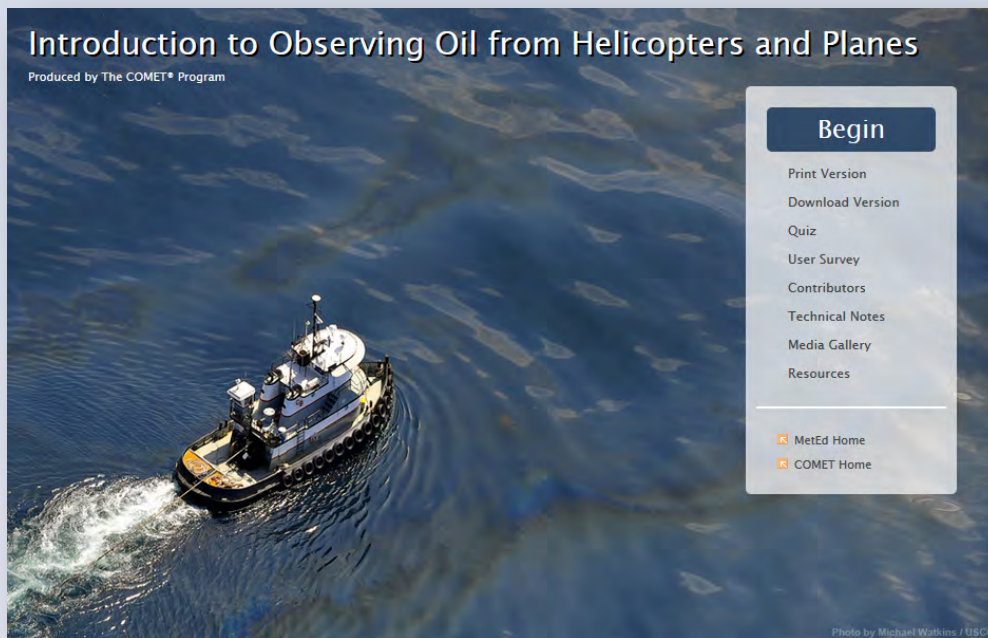


COMET Distance Learning Offerings



COMET Services:

Self-directed, web-based instruction

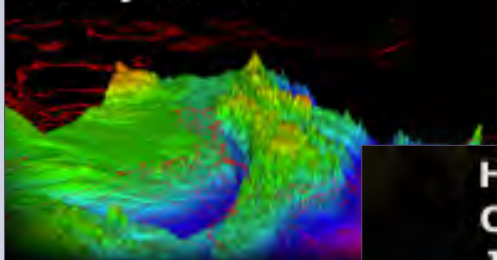


meted.ucar.edu/training_module.php?id=1044

- ▶ 15 minute to 2+ hour in length
- ▶ High quality instructional design and scientific integrity
- ▶ Media rich design
- ▶ Interactive elements
- ▶ Includes self-assessment

Recent COMET Lessons

Satellite Feature Identification: Conveyor Belts



Introduction to Electromagnetic and Electro-Optic Propagation



Creative Commons Ross Grady

How Satellite Observations Impact NWP



/ NCEP / THE COMET

Introduction to Observing Oil from Helicopters and Planes



Photo by Michael Watkins / USCG

Weather Observing Fundamentals



U.S. Navy photo by
Mass Communication Specialist 2nd Class
Timothy Cox (Released)

Caribbean Radar Cases



Creative Commons Flynbys

Developing Web-based Lessons

Average Development Effort for a 1-hour lesson

	Days	% of effort
Project manager	12	9
Subject matter experts	45	34
Instructional designer	55	42
Graphic designer/ animator	10	8
Web developer	10	8
Totals	132	100

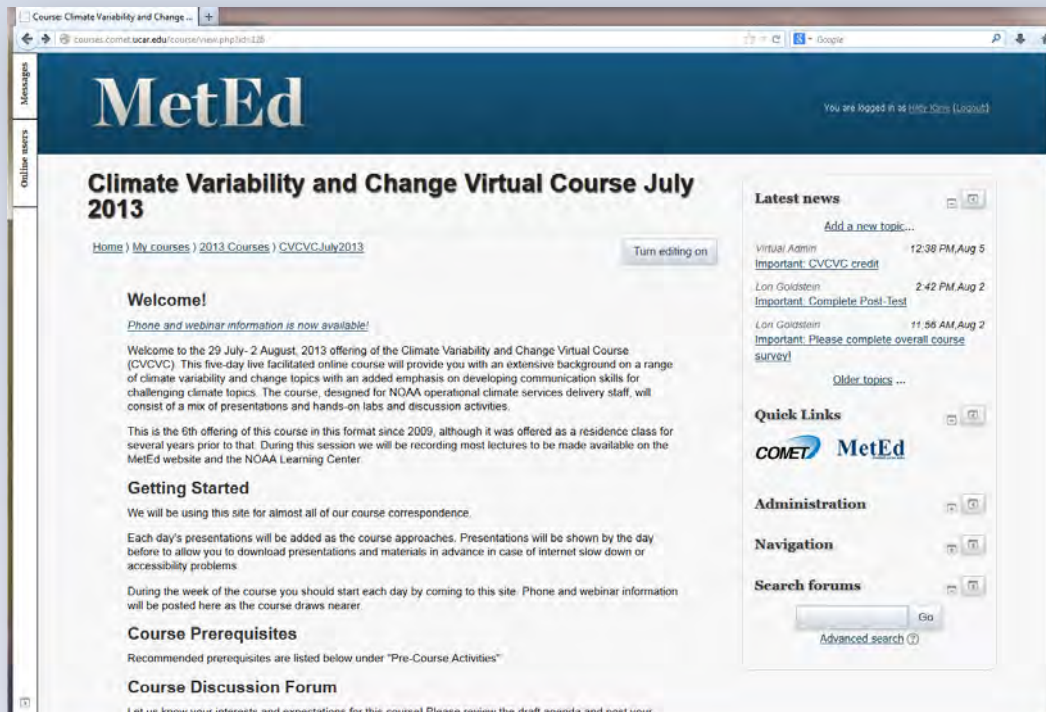
NOTES:

- Project management includes budgeting, resource allocation, quality assurance reviews, etc.
- Day-to-day management is tasked to the project lead, either the met or ID
- Instructional design work and content writing adds up to 70+% of the effort



David Russi, Spanish Translator - COMET
Claudio Caponi, Hydrologist - WMO

COMET Services: Facilitating Virtual and Residence Courses

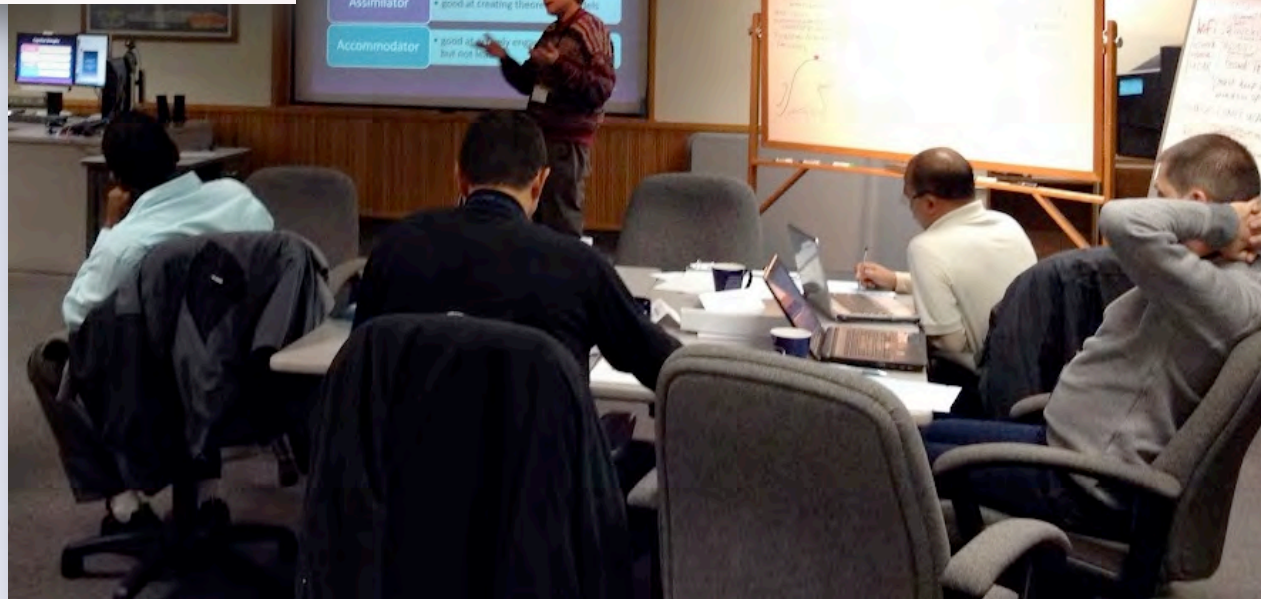


courses.comet.ucar.edu/

- ▶ 8-10 weeks of residence and virtual courses per year
- ▶ Virtual courses (e.g. Climate Variability and Change, Boundary Layer Symposium)
- ▶ Residence courses (e.g. Winter Weather, Mountain Weather, COMAP)
- ▶ Facilitated meetings and workshops (e.g. Satellite Residence course)

Jeff Basara, University of Oklahoma

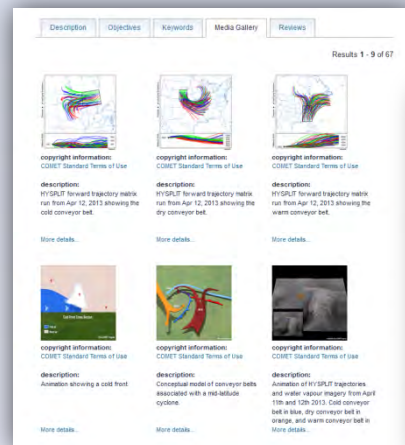
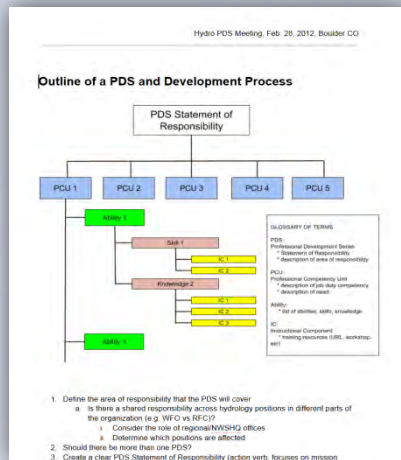
Hydrology Forecasting Workshop



COMET Services: Instructional and Media Design Services

Needs and gap analysis

Video, scripting and production



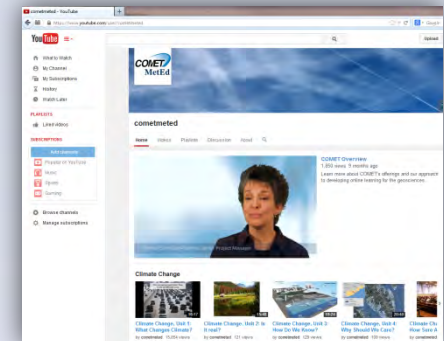
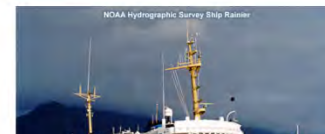
COMET Time Estimates for Media Development

Updated January 2013

Here are sample media items and the estimated times for development based on subject matter experts providing source imagery with specific instructions for modification and one round of review and edits.

NOTE: when accessing links to images and animations you may be prompted to login: login: deved password: comet12

Type 1: Picture that needs resizing, label, copyrights stamp:
10 minutes



Media development
(i.e. database with 35,000+ elements)



Steve Deyo, 3D Graphic Artist - COMET

