

# Training in Road Meteorology

- + SIRWEC Guide
- + MetEd COMET
- EUMETCAL

sulan@chmi.cz



## http://www.sirwec.org





# SIRWEC Guide – Introduction in Prague 2008?

#### A Guide to Road Weather Systems

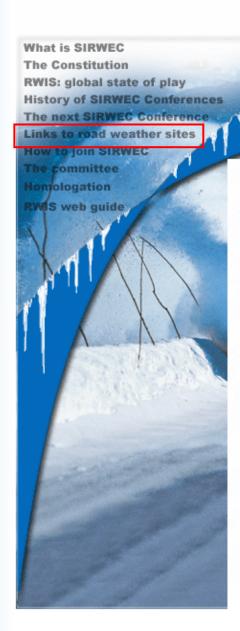
Edited by Steve White, John Thornes and Lee Chapman, University of Birmingham, UK

1	Introduction			
2	The Ba	sics of Road Weather	4	
	2.1 The	Need for Road Weather Systems		
	2.2 The	Importance for Transportation		
		Consequences and Benefits		
	2.3.1	Safety Considerations		
	2.3.2	Environmental Considerations		
	2.3.3	Economic Considerations		
3	The Ro	ad	1	
	3.1 Fact	ors that influence road condition	Ī	
		ogical Parameters		
	3.1.2	Geographical Parameters		
	3.1.3	Road Construction		
	3.1.4	Traffic	1	
	3.2 Und	erstanding Road Adhesion	10	
	3.2.1	Road Conditions.		
	3.2.2	Levels of Service.		
	3.3 Ice,	Snow & Avalanche Control	2	
	3.4 Roa	d Salting	2	
	3.4.1	Treatment Types	2	
	3.4.2	Storage Facilities	2	
	3.4.3	Factors Affecting De-icing Action	2	
	3.4.4	Chemicals Used		
	3.4.5	Surface Type		
	3.4.6	Spreading Vehicles		
	3.4.7	Spreading Controls		
	3.4.8	Spread Patterns		
	3.4.9	Calibration and Maintenance		
	3.4.10	Pre-wetting		
	3.4.11	Liquid Chemicals		
	3.4.12	Zero Velocity Spreading		
	3.4.13	Future Developments		
		w Removal		
	3.5.1 Re	moval Vehicles	4	
		ugh and Blade Design		
		ibility Issues		
		gh Speed Ploughing		
		emical Ploughing		
		libration and Maintenance		
		tion Enhancement		
		omated Spreading Methods		
	3.8 Roa	d Heating	4	
_		ntenance Requirements		
4	The We	eather5	1]	
		natology, Weather Conditions & Weather Changes		
		d Weather Forecasting		
	4.2.1	Road Weather Models		
	4.2.2	Road Temperature Forecast Curves		
	4.2.3	The Decision Making Process	3	

5	Roa	ad Weather Information Systems (RWIS)	55
	5.1	Historical Developments	. 5
	5.2.	.1 Outstation Structure	. 58
	5.2.	.2 Passive, Active & Remote Sensors	. 60
	5.2.	.3 Mobile Sensors	. 60
	5.2.4	.4 Measurement Methods	. 61
	5.3	The Role of Road Weather Outstations	. 62
	5.3.	.1 Maintenance Requirements	. 64
	5.3.	.2 Locating Outstations	. 64
	5.3.	.3 Deployment Strategies	. 6
	5.3.4	.4 Trouble Spots	. 6
	5.3.	.5 Micro-climate Representation	. 65
	5.3.	.6 Virtual Outstations	. 6
	5.4	Thermal Mapping	. 66
	5.5	Thermal Geomatic Surveying	. <u>69</u>
	5.6	The Role of the Sky-View Factor	
	5.7	Data Presentation and Interpretation	
	5.7.	- The state of the	
	5.7.	.2 The Role of Geographical Information Systems (GIS)	. 72
	5.7.	.3 The Role of the Internet	. 72
	5.7.	.4 The Role of Global Positioning Systems (GPS)	. 7
	5.8	International Standards	
	5.9	International Approaches & Systems	
	5.10	Information Provision For End Users	
	5.11	Networking and Data Sharing	. 73
	5.12	The Next Generation RWIS	
	5.13	Extension to the Footway	. 75
6	Bib	oliography	75
	6.1	Key References	. 7



### **Useful links**



-<u></u> - S-I-R-W-E-C-<u></u> -

### Links to other Road Weather Sites

### Other Commercial Companies / Organizations

Axicon (BiTaD), Norway
Campbell Scientific
Cryotech, USA
Davis Instruments, USA
Ilkka Lilja Oy, Finland
micKS, Germany
R.M. Young Company
Salt Institute, USA
Traffic Technology 2000

### Government / Universities / General

<u>Anti-Icinq Research</u>

COST 309, road weather conditions

Weather Solutions Consultants, USA

COST 344, Winterterm Glossary

<u>Aurora</u>

<u>Clarus</u>

FHWA Road Weather Management Program

National Academies book "Where the Weather Meets the Road"

Office of Minnesota Road Research

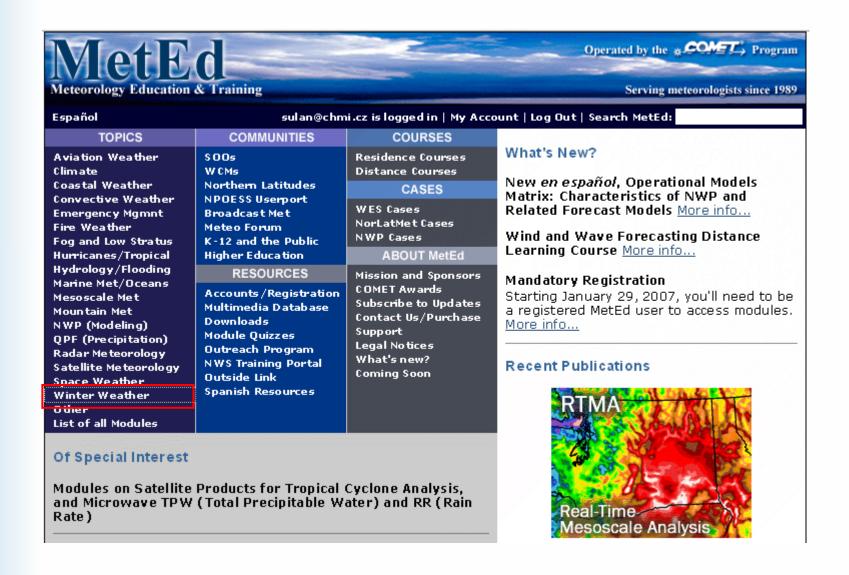
World Road Assocation (PIARC)

Snow and Ice Pooled Fund Cooperative Program (SICOP)

Surface Transportation Weather Research Center

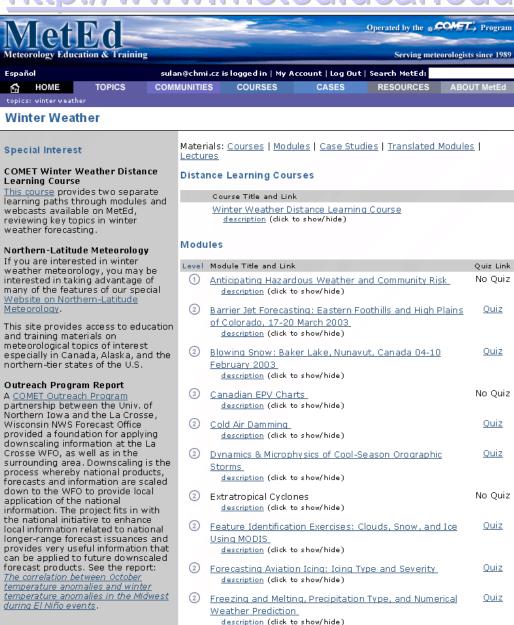


## MetEd – COMET Program





### http://www.meted.ucar.edu





# http://www.meted.ucar.edu

2	Heavy Banded Snow description (dick to show/hide)	<u>Quiz</u>
2	Icing Assessment Using Observations and Pilot Reports description (dick to show/hide)	<u>Quiz</u>
2	Icing Assessment Using Soundings and Wind Profiles description (click to show/hide)	No Quiz
2	Inverted Troughs and Their Associated Precipitation Regimes description (click to show/hide)	Quiz
2	Inverted Troughs Case Exercise description (dick to show/hide)	No Quiz
3	Isentropic Analysis description (click to show/hide)	<u>Quiz</u>
3	<u>Jet Streak Circulations</u> <u>description</u> (dick to show/hide)	Quiz
2	Mesoscale Aspects of Winter Weather Forecasting Topics description (dick to show/hide)	No Quiz
2	Mesoscale Banded Precipitation  description (dick to show/hide)	Quiz
2	Ocean Effect Snow: New England Snow Storm, 14 January 1999  description (dick to show/hide)	<u>Quiz</u>
2	Polar Lows Ungava Bay 01 December 2000 description (dick to show/hide)	No Quiz
2	Polar Satellite Products for the Operational Forecaster (POES) Module 3: Case Studies description (dick to show/hide)	No Quiz
2	Precipitation Type: New Brunswick, 01-03 February 2003 description (dick to show/hide)	Quiz
2	Review of GOES IR Imagery Including Winter and Icing Applications <u>description</u> (dick to show/hide)	No Quiz
2	Satellite Meteorology: Case Studies Using GOES Imager Data <u>description</u> (dick to show/hide)	No Quiz

(2)	Slantwise Convection Case Exercise description (click to show/hide)	No Quiz
2	Slantwise Convection: An Operational Approach description (dick to show/hide)	<u>Quiz</u>
2	Snowmelt Processes  description (click to show/hide)	<u>Quiz</u>
3	The Use and Misuse of Conditional Symmetric Instability description (dick to show/hide)	<u>Quiz</u>
2	Topics in Lake Effect Snow Forecasting description (dick to show/hide)	<u>Quiz</u>
2	Topics in Polar Low Forecasting  description (dick to show/hide)	<u>Quiz</u>
2	Topics in Precipitation Type Forecasting  description (click to show/hide)	<u>Quiz</u>

#### Case Studies

#### Case Title and Link

A Comparison of Diagnosed Vs. Predicted Precipitation Type in the Eta Forecast Model: 3-6 December 2002 description (dick to show/hide)

Eta-12 Forecast for Historic Lake Effect Snow in Buffalo, NY description (dick to show/hide)

Forecasting Aviation Icing: The Icing Event of 6 March 1996 description (dick to show/hide)

<u>Initial Conditions & SREF Forecasts for 6-7 Jan. 2002 NE U.S.</u> <u>Snowstorm</u>

 $\underline{\mathsf{description}} \; (\mathsf{click} \; \mathsf{to} \; \mathsf{show/hide})$ 

return to top^

return to top^

Ma Oute



### **EUMETCAL** – no winter weather module

