Cross ~ Border Workshop

Adaptation to Climate Change:

Information and Tools for Decision-Making

October 17-18, 2017

Syracuse, New York

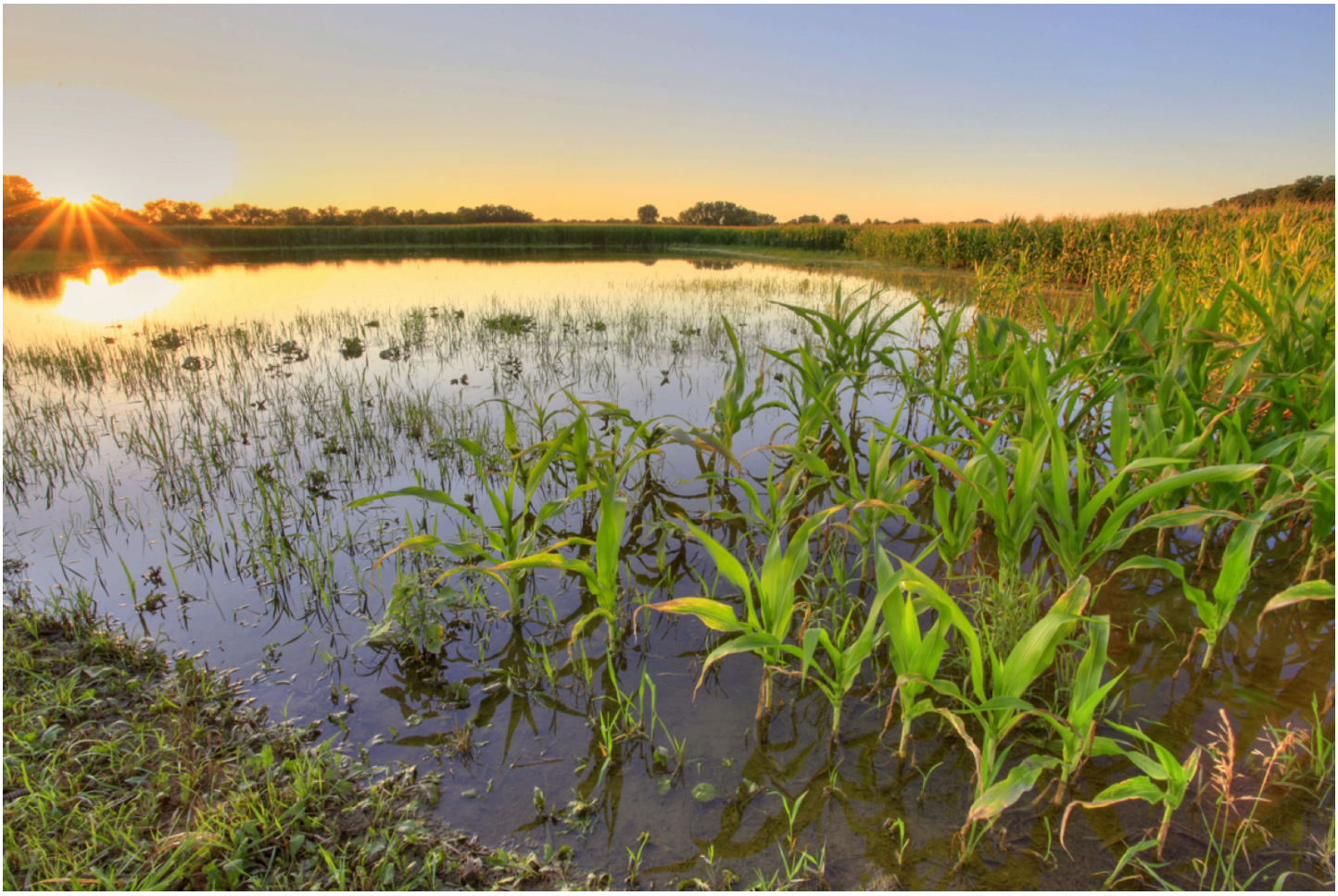

Table of Contents

Cross ~ Border Workshop
October 17–18, 2017

Agenda and Roster

The Cross Border Workshop is supported by:

Environment and Climate Change Canada
Environnement et Changement climatique Canada

Agriculture and Agri-Food Canada
Agriculture et Agroalimentaire Canada

USDA Northeast Climate Hub
U.S. DEPARTMENT OF AGRICULTURE

DAVID R. ATKINSON CENTER
for a Sustainable Future

CICSS
Cornell Institute for Climate Smart Solutions

OURANOS

CORNELL UNIVERSITY FOUNDED A.D. 1865

CROSS ~ BORDER WORKSHOP
Adaptation to Climate Change: Information and Tools for Decision-Making

October 17-18, 2017
Holiday Inn Syracuse/Liverpool
441 Electronics Parkway
Liverpool, NY 13088

Tuesday, October 17
Cotillion Room

7:45 am Bagels, pastries, coffee and tea will be available

8:15 Meet and greet

8:45 Welcome from Mike Hoffmann and Ian Maw, Hosts

9:00 Art DeGaetano, NRCC at Cornell University
Change is in the Air: Northeast U.S. Agriculture in a Changing Climate

9:20 Hank Venema, International Institute for Sustainable Development
Functions of a modern policy and practice-relevant agro-climate research centre

9:40 Eric Ritchie, Agriculture Manager, McCain Foods North America
How does McCain Food address the global climate challenges it faces?

10:00 Discussion and Q&A

10:30 Break

Theme I
Addressing extreme weather events:
How are extreme weather events and climate change affecting soil erosion and nutrient loss in the agricultural landscape?

Allan Howard and Curt Dell, Chairs

11:00 Louis-Pierre Comeau, Agriculture and Agri-Food, Canada
Climate Change and Soil Carbon

11:15 Xeubin Zhang, Environment and Climate Change, Canada
Changes in Climate Extremes

11:30 Todd Walter, Biological and Environmental Engineering, Cornell University
Watershed Issues of the Northeast

11:45 Tony Buda, USDA-Agriculture Research Service
Nutrient losses in hillslope and watershed runoff resulting from an extreme rainfall event

12:00 pm Discussion and Q&A: What are key risks with soil erosion and nutrient loss, and priorities for action in the U.S. and Canada?

12:20 Lunch at the Salt House Restaurant, on own

Theme II
Climate Change, Pests and Diseases:
How will climate change increase pests and disease pressure?

Mike Hoffmann and Jon Neutens, Chairs

1:30 Gaétan Bourgeois, Agriculture and Agri-Food, Canada
Bioclimatic modelling of crop-pest interactions to study the impacts of climate change and variability in Eastern Canada

1:45 René Audet, Agriculture and Agri-Food, Canada
Weather-based Tools to Support Pest Management in a Changing Climate

2:00 Lewis Ziska, USDA- Agriculture Research Service
Climate Change and Pests: Monitor, Mitigate and Manage

2:15 Rachel Schattman, University of Vermont
The Potential Influence of Climate Change on Produce Safety

2:30 Discussion and Q&A: What are key risks with disease and pest pressure, and priorities for action in the U.S. and Canada?

3:00 Break

3:30 Break-Out Discussion: Addressing knowledge gaps and action items

4:30 Synthesize results of group discussions

4:50 pm Wrap up for the day

Dinner is on your own

Wednesday, October 18
Cotillion Room

Theme III
Weather & Climate Decision Support Tools:
What are barriers and motivators to developing and adopting tools?

7:30 am Bagels, muffins, pastries, coffee and tea available

8:00 Welcome from Dave Hollinger and Larry Lenton, Chairs

8:05 Dennis Todey, USDA- Agriculture Research Service
Developing Useful Decision Tools – the U2U Experience

8:35 Tools Café – Danielle Eiseman, Facilitator
Two-Minute introduction from participants:

- René Audet — AgWeather Quebec and AgWeather Atlantic
- Carlos Carillo — New York State/Northeast Drought Atlas
- Colin Beier — New York Climate Science Clearinghouse & GIS Viewer
- Gaétan Bourgeois — CIPRA-2017 Integrated Crop and Pest Management in Eastern Canada
- Dan Cooley — Climate, Weather and Apples
- Keith Eggleston — scACIS , a Northeast Regional Climate Center Tool
- Danielle Eiseman — Cornell's Climate Smart Farming Tools
- Robert Farnham — John Deere Tools
- Rick Fleetwood — Extreme Precipitation (IDF) Viewer for Atlantic Canada
CoCoRaHS Canada Precipitation Network
ECCC Climate Data Archive
- Roland Krobel — Holos Whole-Farm Model
- Ellen Mecray — NOAA Climate.gov
- Manish Patel — Weather INnovations
- Dan Olmstead — The Network for Environment and Weather Applications (NEWA)

Hands-on interaction with tools at Tools Café

10:20am Allison Chatrchyan, Cornell Institute for Climate Smart Solutions
Farmer views and actions on climate change in the U.S.

10:30 am Farmer Panel and Discussion: Allison Chatrchyan and Erin Lane, Facilitators
Farmer Perspectives on climate risk, tools, and adaptation
Participants: Keith Currie, Curriedale Farms, Collingwood, ONT
Sarah Ficken, New Moon Farm, Munsville, NY

- Discussion: What are key climate risks and tools needed by farmers? What are barriers and motivations for farmers to adopt these tools?

11:20 Synergies, Conclusions, and Next Steps – David Lane, Mike Hoffmann, Larry Lenton

- Overview and key points from each theme; gaps in information and research; next steps with group input

12:15 pm Evaluation: Please take a few minutes to take our workshop evaluation electronically or on paper
Link: crossborderworkshopevaluation

12:30 Adjourn

Cross ~ Border Workshop Presenter Abstracts

Art DeGaetano
The effects of climate change are already being felt across the northeastern U.S. and will continue to be felt in the future. The most recent observed climate trends will be examined. Future projections based on the latest set of global climate model simulations and the downscaling technique that will be adopted in the next U.S. national climate assessment will also be presented. Changes will include increases in winter temperatures, a lengthening of the frost-free season and changes in the character of rainfall throughout the year. Special attention will be directed to trends in climate variables that are likely to have the greatest impact on Northeast agriculture. These include an examination of spring freeze risk in fruit crops, the impact of summer heat stress on dairy production, and potential changes in spring fieldwork conditions.

Hank Venema
Dr. Hank Venema will discuss the key functions of a modern policy and practice-relevant agro-climate research centre. Key topics of discussion will include; localized climate projection data; agro-climatic risk assessment using GCMs; stochastic crop, biomass production and sequestration modelling; natural infrastructure systems design and investment planning, and extension and monitoring services for climate resiliency.

Eric Ritchie
Addressing raw material supply issues as a component of the food manufacturing process will be the focus of the presentation. Considering the effects of climate change Mr. Ritchie will highlight three key considerations: building resilience into the farm production system by improving soil health; addressing crop husbandry practices to buffer climate extremes; innovative procurement strategies to insure security of supply.

Theme I: Addressing Extreme Weather Events

Louis-Pierre Comeau
Dr. Louis-Pierre Comeau presentation will examine the different BMPs as tools to mitigate and adapt to climate change from an SOM stand point. The main topics of discussion will be; soil organic matter genesis, extreme weather and climate impact on soil formation, and the uncertainties about soil carbon in agriculture.

Xeubin Zhang
Various international and national bodies including the Intergovernmental Panel on Climate Change and the Canadian and the US governments have assessed past and future changes in the climate. As impacts of the climate mostly result from weather and climate extremes, past and future changes in climate extremes are important aspects of the assessments. There is very robust evidence of changes in temperature related extremes including the increase in hot extremes and decrease in cold extremes, and such changes are very likely due to human influence on a global scale. The frequency or intensity of heavy precipitation events has likely increased in North America. There is also clear evidence of human contribution to the observed changes in extreme precipitation on a global scale. The observed changes in extremes are projected to continue towards the future. While at the global and continental scales the evidence of past change is

robust and confidence on future projection is high for many types of extremes, at the regional and local scales that are more relevant to the impacts and adaptation there are larger uncertainties. This presentation provides a general overview about past and future changes in climate extremes.

Theme II: Climate Change, Pests and Diseases

Gaétan Bourgeois
To help manage agricultural crops and their pests, weather-based decision computerized systems are useful tools for producers. In Eastern Canada, more than 130 of these weather-based mathematical models are implemented in the CIPRA (Computer Centre for Agricultural Pest Forecasting) software, which can be used as a "virtual laboratory" of bioclimatic modelling for many scientists, as a knowledge integrator of several fields of expertise (e.g. climatology, plant physiology, entomology, phytopathology, etc.), and as an efficient technology transfer tool for all stakeholders involved in crop production. These models predict the phenology of several crops, as well as the development of insect pests, diseases and physiological disorders. They are also used to study historical climate trends (e.g. 1950-2016) and the potential impacts of climate change and variability (e.g. 2041-2070). Global warming will affect the rate of insect development resulting in additional generations within a year, their winter survival, and their distribution. Pathogens also depend on temperature, but their epidemic success, in terms of dispersion, infection, and sporulation, is mostly related to moisture (e.g. leaf wetness), which is more difficult to predict since uncertainty related to rainfall projections in the future is greater than uncertainty related to temperature. Nevertheless, it is essential to realize now that the pressure caused by pests will change according to climate variations, especially in a context where the industry is seeking to reduce the use of pest control products that may have adverse effects on the environment and human health.

René Audet
Studies have shown that the province of Quebec will face increased pressure from already present pests and invasive species because of climate change. In this context, there is a need for even stronger pest monitoring and forecasting programs, such as Quebec's *Réseau d'avertissements phytosanitaires* (RAP, Quebec Plant Pest Warning Network). Also, because of the sensitivity of most pests to climate conditions, weather-based decision support tools should be an integral part of pest risk management. The web platform AgWeather Quebec (AQ), a multi-partner initiative lead by Agriculture and Agri-Food Canada, was launched in 2006, in large part to provide quality weather data and tools to support the activities of the RAP. More specifically, AQ currently offers 49 bioclimatic models that can forecast the development of certain insect pests (37) and diseases (2) as well as crop phenology (10). These models are used by agricultural advisors across the province to plan field scouting and warn farmers of potential pest risks, helping them decide when to intervene if necessary. Quality controlled real-time weather data and 7-day forecasts feed these models, with outputs presented in map, graphical and table formats. The weather observations are provided by a network of approximately 200 automated stations belonging to various partner organizations (a "network of networks"). Within the next couple of years, 35 additional pest and crop phenology models will be added to the website and an improved version of the AgWeather mobile application, integrating at least 20 bioclimatic models, will be developed.

Lew Ziska
Rising concentrations of atmospheric carbon dioxide, C_a and subsequent changes in climate, including temperature and precipitation extremes, are very likely to alter weed pressures in both managed and unmanaged plant communities. Such changes in weed pressures can be positive (migration from a region), or negative (new introductions), but are likely to be accompanied by significant economic and environmental consequences. Recent studies indicate the range of invasive weeds like kudzu have already expanded to more northern regions as temperatures have risen. To reduce these consequences, a better understanding of the link between C_a /climate and pest biology is needed in the context of existing and new strategies for pest management. Here we provide an overview of the probable biological impacts, the vulnerabilities of existing weed management, (esp. chemical control) and provide a preliminary synthesis of research needs that could potentially improve our ability to monitor, mitigate and manage weed impacts.

Rachel Schattman
Climate change and food safety are overlapping issues that face vegetable producers in the northeastern United States and Canada. Many agricultural producers in our border-crossing region are already adapting to changing climate patterns, including changes in precipitation and temperature. Simultaneously, because of recent public health outbreaks (and subsequent litigation) traced back to fresh produce, food safety hazard identification and risk mitigation has become the focus of significant regulatory changes in the United States. Specifically, regulation through the Food Safety Modernization Act (FSMA) and the Produce Safety Rule (PSR) impact both producers in the United States and those that would export to the United States. The link between climate change and food safety, specifically related to fresh produce, is not well understood. Thought climate change has been identified as a challenge facing control of microbiological risks in the global produce-supply chain, it is unclear how changing climatic condition will affect risk on farms in temperate climates. This session will explore the research that is currently available on the topic, and identify areas which require further exploration.

Theme III: Weather and Climate Decision Support Tools

Dennis Todey
Many current research efforts mention creating tools out of existing research efforts/results. That is a great plan for keeping an end-goal in mind on research. But often the tools needed must be driven by the producer based on questions they are asking in how to manage their operation. Matching needs and research capabilities in a usable way is not an easy process. Dr. Todey will address some of these issues from his experience as a former state climatologist and member of the successful AFRI-funded Useful to Usable Project (U2U).

CROSS ~ BORDER WORKSHOP STEERING COMMITTEE

Name	Affiliation
Anne Blondlot	Ouranos Consortium
Allison Chatrchyan*	Cornell Institute for Climate Smart Solutions
Curtis Dell*	USDA-Agricultural Research Service
Danielle Eiseman*	Cornell Institute for Climate Smart Solutions
Richard Fleetwood	Environment and Climate Change Canada
Richard Hardin	Agriculture and Agri-Food Canada
Michael Hoffmann*	Cornell Institute for Climate Smart Solutions
David Hollinger*	USDA- Forest Service
Allan Howard*	Agriculture and Agri-Food Canada
David Lane*	Cornell Institute for Climate Smart Solutions
Erin Lane*	USDA-Forest Service
Larry Lenton*	Agriculture and Agri-Food Canada

CROSS ~ BORDER WORKSHOP PRESENTERS

Name	Affiliation
René Audet	Agriculture and Agri-Food Canada
Gaétan Bourgeois	Agriculture and Agri-Food Canada
Anthony Buda	USDA- Agricultural Research Service
Louis-Pierre Comeau	Agriculture and Agri-Food Canada
Arthur DeGaetano	Cornell University, Northeast Regional Climate Center
Eric Ritchie	McCain Foods North America
Rachel E. Schattman	University of Vermont
Dennis Todey	USDA- Midwest Climate Hub
Todd Walter	Cornell University
Henry Venema	International Institute for Sustainable Development
Xeubin Zhang	Environment and Climate Change Canada
Lewis H. Ziska	USDA- Agricultural Research Service

CROSS ~ BORDER WORKSHOP PARTICIPANTS

Colin Beier	SUNY College of Environmental Science & Forestry
Carlos Carrillo	Cornell University
Michel Cavigelli	USDA- Agricultural Research Service
Keith Currie	Canadian Federation of Agriculture
Dan Cooley	University of Massachusetts, Amherst
John Dillman	Prince Edward Island Dept. of Agriculture and Fisheries
Robert Farnham	John Deere
Sarah Ficken	New Moon Farms
Sebastian Ibarra	Prince Edward Island Dept. of Agriculture and Fisheries
Roland Kroebel	Agriculture and Agri-Food Canada
Dan MacDonald	Agriculture and Agri-Food Canada
Ian Maw*	Association of Public and Land Grant Universities
Ellen Mecray	NOAA/NESDIS/National Centers for Environmental Information
Jon Neutens*	Weather INnovations
Dan Olmstead	Cornell University
Manish Patel	Weather INnovations

Robin Shepard	North Central Cooperative Extension Association
Donald Smith	McGill University
Rachel F. Steele	USDA National Climate Hubs
Kyra Stiles	Prince Edward Island Dept. of Agriculture and Fisheries
Gary Telford	Agriculture and Agri-Food Canada
Kaila Thorn	The Pennsylvania State University
Thomas Vogelmann	University of Vermont Agriculture Experiment Station

*Denotes Theme or Section Host

CROSS ~ BORDER WORKSHOP TOOLS CAFÉ PRESENTERS

Name	**Tools Café Topic**
René Audet	AgWeather
Carlos Carrillo	Drought Atlas
Colin Beier	NY Climate Science Clearinghouse & GIS Viewer
Gaétan Bourgeois	CIPRA-2017 Integrated Crop and Pest Management in Eastern Canada
Daniel Cooley	Climate, Weather and Apples Research
Art DeGaetano	NRCC?
Danielle Eiseman	Cornell Institute for Climate Smart Solutions
Robert Farnham	John Deere
Richard Fleetwood	Extreme Precipitation (IDF) Viewer for Atlantic Canada; CoCoRaHS Canada Precipitation Network; and ECCC Climate Data Archive
Roland Kroebel	Holos Whole-farm Model
Ellen Mecray	NOAA
Manish Patel	Weather INnovations
Dan Olmstead	The Network for Environment and Weather Applications(NEWA)

Cross ~ Border Workshop Contact Information

René Audet
Agrometeorologist
Agriculture & Agri-Food Canada
2560 Hochelaga Blvd
Québec, Canada, G1V 2J3
Rene.Audet@AGR.GC.CA
418-210-5018

Colin Beier
Associate Professor
Forest & Natural Resources Mgmt.
SUNY College Env Sci & Forestry
311 Bray Hall
1 Forestry Drive
Syracuse, NY 13210
cbeier@esf.edu
315-470-6578

Anne Blondlot agr.
Coordinator of the Agriculture, Commercial Fisheries & Aquaculture Scientific Program
Ouranos Consortium
550 Rue Sherbrooke W.
West Tower, 19th Floor
Montreal, QC H3A 1B9
Blondlot.Anne@ouranos.ca
514-282-6464 Ext 291

Gaétan Bourgeois
Bioclimatology & Modelling
Agriculture & Agri-Food Canada
430 Gouin Blvd
Saint-Jean-sur-Richelieu, QC
J3B 3E6
Gaetan.Bourgeois @agr.gc.ca
579-224-3150

Anthony Buda
Research Hydrologist
Pasture Systems & Watershed Mgmt. Research Unit
USDA-ARS
Bldg. 3702, Curtin Road
University Park, PA 16802
anthony.buda@ars.usda.gov
814-865-6623

Carlos Carrillo
Postdoctoral Researcher
Earth & Atmospheric Sciences
Cornell University
Bradfield Hall, Rm 1105
Ithaca, NY 14853
cmc542@cornell.edu

Michel Cavigelli
Research Soil Scientist
USDA-ARS
Beltsville Agricultural Res. Center
Sustainable Agricultural Syst Lab
Bldg. 001, Rm 118
10300 Baltimore Ave.
Beltsville, MD 20705
301-504-8327

Allison Chatrchyan
Director
Cornell Institute for Climate Smart Solutions
Cornell University
103 Rice Hall
Ithaca, NY 14853
amc256@cornell.edu
607-254-8808

Daniel Cooley
Professor
Plant Pathology
Univ. of Massachusetts Amherst
418 Paige Laboratory
Amherst, MA 01003
dcooley@umass.edu
413-531-3803

Louis-Pierre Comeau
Research Scientist
Landscape and Soil Carbon
Agriculture & Agri-Food Canada
850 Lincoln Rd
PO Box 20280
Fredericton, NB E3B 4Z7
Louis-pierre.comeau@canada.ca
506-460-4464

Keith Currie
President, Ontario Federation of Agriculture
Ontario AgriCentre
100 Stone Road West, Suite 206
Guelph, ON N1G 5L3
keith.currie@ofa.on.ca
705-441-3362

Art DeGaetano
Professor, Earth & Atmospheric Sciences
Director, NE Regional Climate Ctr.
Cornell University
1119 Bradfield Hall
Ithaca, NY 14853
atd2@cornell.edu
607-255-0385

Curtis Dell
Research Soil Scientist
Pasture Systems & Watershed Mgmt. Research Unit
USDA-ARS
Bldg. 3702, Curtin Road
University Park, PA 16802
Curtis.dell@ars.usda.gov
814-863-0984

Josh Dillman
Soil & Water Conservation Eng.
PEI Department of Ag. & Fisheries
Jones Building
11 Kent St, 5th Flr.
Charlottetown, PEI C1A 7N8
jdillman@gov.pe.ca
902-314-0783

Danielle Eiseman
Program Manager
Cornell Institute for Climate Smart Solutions
Cornell University
205 Rice Hall
Ithaca, NY 14853
dle58@cornell.edu
607-254-8808

Robert Farnham
Solutions Specialist
John Deere
5460 Hinman Rd
Lockport, NY 14094
farnhamrobert@johndeere.com
716-213-7202

Sarah Ficken
Grower
New Moon Farm
5333 Stockbridge Falls Rd
Munnsville, NY 13409
newmoondairyfarms@gmail.com
315-495-6504

Richard Fleetwood
Manager, Climate Services Atlantic
Env. & Climate Change Canada
77 Westmoreland St, Ste. 260
Fredericton, NB E3B 6Z3
rick.fleetwood@canada.ca
506-451-6032

Richard Hardin
Land Resources Specialist
Science & Technology Branch
Agriculture & Agri-Food Canada
Box 20280
850 Lincoln Rd
Fredericton, NB E3B 4Z7
richard.hardin@agr.gc.ca
506-460-4330

Mike Hoffmann
Executive Director
Cornell Institute for Climate Smart Solutions
Cornell University
105A Rice Hall
Ithaca, NY 14853
mph3@cornell.edu
607-255-2552

David Hollinger
Climate, Fire & Carbon Cycle Sci.
USDA-Forest Service
271 Mast Rd
Durham, NH 03824
dhollinger@fs.fed.us
603-868-7673

Allan Howard
Director
Agroclimate, Geomatics & Earth Observation Division
Agriculture & Agri-Food Canada
2010 12th Ave Rm 300
Regina, SK S4P 0M3
allan.howard@agr.gc.ca
306-523-6789

Sebastian Ibarra, MPM, AIT
Agri-environmental Specialist/PMUC
PEI Department of Ag. & Fisheries
PO Box 2000
5th Floor Jones
Charlottetown, PEI C1A 7N8
sibarra@gov.pe.ca
902-314-3088

Roland Kroebel
Researcher
Lethbridge R&D Centre
Agriculture & Agri-Food Canada
5403 1st Avenue South
Lethbridge, AB T1J 4B1
Roland.kroebel@agr.gc.ca
403-317-3434

David Lane
Postdoctoral Research Associate
Cornell Insitute for Climate Smart Solutions
Cornell University
102A Rice Hall
Ithaca, NY 14853
del97@cornell.edu
607-255-5656

Erin Lane
Natural Resource Specialist
USDA-Northeast Climate Hub
271 Mast Rd
Durham, NH 03824
edlane@fs.fed.us
603-393-0372

Larry Lenton
Director
Knowledge Tech. Transfer Office
Agriculture & Agri-Food Canada
2010 12th Ave Rm 300
Regina, SK S4P 0M3
Larry.Lenton@AGR.GC.CA
306-523-6781

Dan MacDonald
Special Advisor
Agro-Ecosystem Resiliency
Agriculture & Agri-Food Canada
960 Carling Ave, K.W.
Neatby Bldg. 1st Flr. Rm 1139
Ottawa, ON K1A 0C6
Dan.MacDonald@agr.gc.ca
613-759-1893

Ian Maw
Vice President
Food, Ag & Natural Resources
Assoc. Public & Land-Grant Univ.
1370 New York Ave, NW Ste. 400
Washington, DC 20005-4722
imaw@aplu.org
202-478-6031

Ellen Mecray
Director, Regional Climate Service, Eastern Region
NOAA/NESDIS/National Centers for Environmental Information
445 Myles Standish Blvd.
Taunton, MA 02780
Ellen.L.Mecray@noaa.gov
508-824-5116, Ext. 263

Jon Neutens
President
Weather INnovations
PO Box 23005
7159 Queens Line RR9
Catham, ON N7M 0B1
jneutens@weatherinnovations.com
519-352-5334

Dan Olmstead
Coordinator
Network for Environment & Weather Applications (NEWA)
New York State IPM Program
NYSAES, Cornell University
630 West North Street,
Geneva, NY 14456
dlo6@cornell.edu
315-787-2207

Manish Patel
Owner and Partner
Weather INnovations
PO Box 23005
7159 Queens Line RR9
Catham, ON N7M 0B1
mpatel@weatherinnovations.com
519-352-5334

Eric Ritchie
Senior Manager Agriculture NA
Farm Assurance & Policy
McCain Foods Ltd.
8800 Main Street
Florenceville-Bristol, NB E7L 1B2
eric.ritchie@mccain.com
506-392-2865

Rachel E. Schattman
Research Specialist
University of Vermont Extension
UVM Extension S. Burlington Off.
140 Kennedy Dr
S. Burlington, VT 05403
rschattm@uvm.edu
802-651-8343 Ext. 509

Robin Shepard
Executive Director
North Central Cooperative
Extension Association (NCCEA)
432 N. Lake St., Rm 413
Madison, WI 53706
robin.shepard@ces.uwex.edu

Donald Smith
James McGill Professor
Director & CEO
BioFuelNet Canada
Plant Science Department
McGill University
21111 Lakeshore Road
Ste Anne de Bellevue
QC H9X 3V9
donald.smith@mcgill.ca
514 398-7866

Rachel Steele
National Climate Hubs Coordinator
USDA
1400 Independence Ave SW
Washington, DC 20250
rsteele@oce.usda.gov
202-720-8121

Kyra Stiles
Nutrient Management
P.E.I. Dept. of Ag & Fisheries
111 Kent St, 5th Flr.
Charlottetown, PEI C1A 7N8
kstiles@gov.pe.ca
902-316-1600

Gary Telford
Knowledge Transfer Officer
Agriculture & Agri-Food Canada
Coastal Region
PO Box 1000
6947 Highway 7
Agassiz, BC V0M 1A0
Gary.Telford@agr.gc.ca
604-796-6101

Kaila Thorn
Research Assistant
The Pennsylvania State University
637 Marjorie Mae Street
State College, PA 16803
Kvt5218@psu.edu
321-412-7550

Dennis Todey
Director
USDA Midwest Climate Hub
National Lab for Agriculture &
Environment
2110 University Blvd.
Ames, IA 50011
dennis.todey@ars.usda.gov
515-294-2013

Henry Venema
Director of Planning
Prairie Climate Center
International Institute for
Sustainable Development
111 Lombard Avenue, Ste .325
Winnipeg, Manitoba R3B 0T4
hvenema@iisd.ca
204-899-0104

Thomas Vogelmann
Dean, College of Agriculture and
Life Sciences
Director, Vermont Agricultural
Experiment Station
Professor Plant Biology
University of Vermont
146 University Place
Burlington, VT 05405-0106
Thomas.Vogelmann@uvm.edu
802-656-0321

Todd Walter
Professor, Biological &
Environmental Engineering
Director, Water Resources Institute
Cornell University
222 Riley Robb Hall
Ithaca, NY 14853
mtw5@cornell.edu
607-255-2488

Xeubin Zhang
Climate Change Detection &
Analysis
Environment & Climate
Change Canada
4905 Dufferin St
Toronto, ON M3H 5T4
xuebin.zhang@canada.ca
416-739-4713

Lewis H. Ziska
Senior Researcher
Adaptive Cropping Systems Lab
USDA-ARS
10300 Baltimore Ave.
Beltsville, MD 20705-2350
Lewis.Ziska@ARS.USDA.GOV
301-504-6639

Cross ~ Border Workshop Biographies

René Audet, Agriculture and Agri-Food Canada
René Audet is an agricultural meteorologist working at the Quebec City Research and Development Centre of Agriculture and Agri-Food Canada (AAFC).
Since joining AAFC, his work has mainly focused on the development and transfer of decision support tools for farmers and agricultural advisors to better manage weather and climate variability. He has lead the development of AgWeather Quebec and Atlantic as well as coordinating the Agroclimatic Atlas of Quebec initiative. He has also collaborated on various other projects related to the adaptation of the Quebec agricultural sector to climate change.
Before working with AAFC, he was a weather forecaster with the Meteorological Service of Environment Canada and spent a few years as an agrometeorologist for the Quebec Department of Agriculture.

Anne Blondlot, Ouranos Consortium
Anne holds a Master's from the National Superior School of Agronomy and Food Industries of Nancy (France). She is a member of the Order of agrologists of Quebec. After graduation, she served as a consultant in rural development and in precision farming in several countries. For 10 years, Ms. Blondlot conducted research activities on herbicides for a French agricultural applied-research institute and coordinated the development and operation of a decision support tool for farmers, based on satellite imagery. At Ouranos since 2009, Ms. Blondlot coordinates the Agriculture, Commercial Fisheries and Aquaculture program, and co-coordinates the Water Management program within the Vulnerabilities, Impacts and Adaptation Group.

Gaétan Bourgeois, Agriculture and Agri-Food Canada
Gaétan Bourgeois obtained his M.Sc. degree in Crop Biology at Laval University in Sainte-Foy, Quebec (1985) and his Ph.D. degree in Agriculture at the University of Florida in Gainesville, with a specialization in Agricultural Systems Modelling (1989). Since 1989 he been a research Agriculture and Agri-Food Canada (AAFC) at the Research and Development Centre in Saint-Jean-sur-Richelieu, Quebec. He supervises the activities of the research team in bioclimatology and modelling. One of their major achievements is the CIPRA software (Computer centre for agricultural pest forecasting) which allows the prediction, in real time and forecasted time, of the risks associated to crop pest development as a function of weather. Created and implemented in 1994, and updated yearly afterwards, this software is characterized by its integration of complex bioclimatic concepts within a user friendly interface, which makes it an ideal tool for studies on the impacts of climate change and variability.

Tony Buda, USDA-ARS, Pasture Systems Watershed Management Research Unit
Dr. Buda is a Hydrologist for the Pasture Systems and Watershed Management Research Unit. He serves as a team member on the project " Management and Conservation Practices to Improve Water Quality in Agroecosystems of the Northeastern Us ". His research focuses on hydrological and water quality studies at plot, field, and watershed scales to determine the effects of agricultural management, landscape factors, and soil characteristics on the fate and transport of nutrients, sediments, and emerging contaminants in runoff.

Allison Chatrchyan, Cornell Institute for Climate Smart Solutions (CICSS)
Allison is the Director of the Cornell Institute for Climate Smart Solutions, and a Senior Research Associate in the departments of Development Sociology and Earth and Atmospheric Sciences at Cornell University. With the Institute, Dr. Chatrchyan facilitates interdisciplinary research and extension teams and helps develop resources and tools for climate change adaptation and mitigation. Her research focus is on assessing views and actions on climate change, multi-level climate change governance mechanisms, and climate change policies and institutions. Dr. Chatrchyan helped establish the Cornell Climate Smart

Farming program, the University Climate Change Seminar series, and has led the Cornell Delegations to COP21, COP22, and COP23. Dr. Chatrchyan previously worked for the Bard Center for Environmental Policy, University of Maryland, United Nations Environment Programme in Paris, France, and the Environmental Policy Center in Washington, DC. A native of Hamilton, NY, she received her Ph.D. and M.A. from the University of Maryland in College Park, and her B.A. from Colby College in Waterville, ME.

Louis-Pierre Comeau, Agriculture and Agri-Food Canada
Louis-Pierre was raised in Montreal and spent part of his childhood in the family sugar bush. He completed his B.Sc. in Biology at the University of Mexico, his M.Sc. in Soil Science at the University of Saskatchewan and his Ph.D. at the University of Aberdeen, UK. During the last year of his Ph.D. he did a ten-month internship in a soil lab located in the International Potato Center in Lima, Peru. Following his Ph.D. degree he worked for several months with Dr. Bobbi Helgason (AAFC Saskatoon) comparing the thermodynamic efficiency of the soil microorganisms from the organic-diversified annual grain system and reduced-diversified annual grain system. His postdoctoral study made at the Chinese University of Hong Kong assessed the effect of experimental litterfall and rainfall manipulations on soil greenhouse gas exchange in a subtropical forest. Louis also has a fiancée, a four years old son and he loves to play hockey.

Art DeGaetano, Cornell University
Art DeGaetano is a Professor in the Department of Earth and Atmospheric Sciences at Cornell. He is also the director of the NOAA Northeast Regional Climate Center (NRCC). The NRCC`s mission is to enhance the use and dissemination of climate information to a wide variety of sectors in the Northeast. Art serves as a climate editor for the Bulletin of the American Meteorological Society. He also was a Principal Investigator on The ClimAID Integrated Assessment for Effective Climate Change Adaptation Strategies in New York as well as a contributor to the 2013 National Climate Assessment. He received an interdisciplinary Ph.D. focusing on Climatology and Horticulture from Rutgers University in 1989.

Curtis Dell, USDA-Agricultural Research Service
Dr. Dell has been a Research Soil Scientist with the USDA-Agricultural Research Service at University Park, Pennsylvania since 2001, and he is an Adjunct Associate Professor with the Ecosystem Science and Management Department at Penn State University. His research focuses on carbon and nitrogen cycling in manure-amended and pasture soils and on the impact of nutrient management on water and air quality, with an emphasis on measurement of nitrogen gas emissions (nitrous oxide and ammonia). From 2012 to 2014, he served as a Science Advisor to the USDA-NRCS for the Chesapeake Bay Watershed. He received a Ph.D. in soil microbial ecology from Kansas State University in 1998, M.S. in soil microbiology from Purdue University in 1991, and B.S. in agronomy from Purdue University in 1985.

Danielle Eiseman, Cornell Institute for Climate Smart Solutions (CICSS)
Danielle recently joined the CICSS team as the Program Manager. She has a background in climate change policy, communications and public engagement, as well as experience with social media campaigns and best practices in pro-environmental behavior change. Danielle previously worked in climate change policy and public engagement in Scotland. Her Ph.D. is in Marketing from Heriot Watt University in Edinburgh, Scotland. Danielle also holds a Master's in Carbon Management from the University of Edinburgh, a Master's in Marketing and Economics from DePaul University, and a Bachelor's in Chemistry from Miami University**.**

Richard Fleetwood, Environment and Climate Change Canada
Rick graduated with a BSc. with specialization in meteorology from the University of Alberta in Edmonton in 1987. He joined the Meteorological Service of Canada the same year and worked the first few years of his career as an operational forecaster at the Arctic Weather Center in Edmonton, Alberta. In

1990 he moved to the east coast and continued to develop his forecast skills at the Maritimes Weather Center in Bedford, Nova Scotia. In 1993 Rick moved to the newly established New Brunswick Weather Services Office in Fredericton and was a forecast operations supervisor from 1993 to 2004. This included a one year posting to Bermuda as a forecaster for the Bermuda Weather Service in 1995-1996. Since 2004 he has worked as a regional climatologist managing the climate services unit for the Atlantic region. Rick has considerable experience in the use and analysis of climate and weather data and provision of climate services.

Richard Hardin, Agriculture and Agri-Food Canada
Richard is a Land Resource Specialist with Agriculture & Agri-Food Canada (AAFC). In his time with AAFC he has worked on a broad range of issues and projects relating to agriculture and collaborated with a wide array of partners. Most of his work has traditionally been focused upon decision support tools and information for the agriculture industry in relation to environment and production related issues but has worked in policy, research, and strategic planning. Richard has worked across Canada in a variety of capacities with AAFC, and currently works and resides in the province of New Brunswick where he is focused on development activities related to research.

Michael Hoffmann, Cornell Institute on Climate Smart Solutions (CICSS)
Mike is the executive director of the Cornell Institute for Climate Smart Solutions, which was created to help raise the profile of the challenges posed by a rapidly warming climate and to help those who grow our food adapt to the changing conditions as well as reduce their carbon footprint. As executive director he provides visionary leadership, communicates to a wide range of audiences the challenges and opportunities that come with a changing climate, and builds partnerships among public and private organizations. Previous positions he has held at Cornell include Director of the Cornell University Agricultural Experiment Station, associate dean of the College of Agriculture and Life Sciences, associate director of Cornell Cooperative Extension, and director of the New York State Integrated Pest Management Program. He is a professor in the Department of Entomology where he has focused on ecologically-based management of insect pests. He received his Bachelor's Degree from the University Wisconsin, Masters from the University of Arizona and PhD from the University of California, Davis.

Allan Howard, Agriculture and Agri-Food Canada
Allan received his M. Sc. in Soil Physics from the University of Alberta in 1983. He joined Alberta Agriculture in 1989 as the Provincial Soil Moisture Specialist and worked for fifteen years in soil moisture conservation, drought risk assessment and nutrient transport. He joined Agriculture and Agri-Food Canada Prairie Farm Rehabilitation Administration (PFRA) in Regina in 2004 as Manager of the National Agroclimate Information Service. Following the inception of the Science and Technology Branch, he was Manager of Science Development and recently was appointed Director of the Agroclimate Geomatics and Earth Observations Division of STB. Allan has worked extensively in drought assessment, agroclimate, soil moisture assessment and soil nutrient management and he has a strong interest in hydrology and remote sensing. He has been a key liaison to Environment and Climate Change Canada's (ECCC) Science and Technology and Meteorological Services of Canada Branches. Since 2010 he has been one of Canada's representatives on the World Meteorological Organization Commission for Agrometeorology and is their Lead of the Drought Expert Team.

David E. Lane, Cornell Institute on Climate Smart Solutions (CICSS)
David Lane is a Postdoctoral Social Scientist at the Cornell Institute for Climate Smart Solutions (CICSS). His research helps us understand farmer views and decisions around extreme weather and climate change in the Northeast. He has four degrees, including a Master of Education (Ed.M.) in Adult Education from Oregon State University where he taught Environmental Education, Spanish, and English courses for 17 years. David's Ph.D. research in Environmental Sciences uses applied linguistics to examine the importance of how we frame environmental problems. He wrote a book based on this

research entitled Reframing Environmental Problems (2012). His passion is cultivating and manifesting a new vision of farming which is climate smart and resilient.

Erin Lane, USDA – Northeast Climate Hub
Erin is the Coordinator for the USDA Northeast Climate Hub. The Climate Hubs promote climate-informed decision-making for farms and forest lands. Erin is a career employee of the US Forest Service and joined Northern Research Station in 2014. Her background and education are in fire ecology in the Northeast and she is one of the leaders of the North Atlantic Fire Science Exchange. Duties for both organizations include bringing people together, cultivating communications, and sharing experiences to improve efficiency and productivity. Erin has strong passion for collaboration and working together toward solutions to enhance lives. She has enjoyed co-leading the organization of this meeting with Canadian partners.

Larry Lenton, Agriculture and Agri-Food Canada
Larry is Director, of Knowledge and Technology Transfer for the Prairie Region of Agriculture and Agri-Food Canada's Science and Technology Branch. Over the past 32 years Larry has held many positions in the Department including Special Advisor on advancing Aboriginal agriculture, managing a $110M Greencover Canada national program towards on-farm adoption of beneficial farming practices, supporting the development of a community of practice around knowledge transfer and providing leadership to Canada's representation on the USDA Climate Hubs that border Canada. Larry resides in Regina, Saskatchewan, and can be found in his leisure time coaching volleyball and cycling the country side with his wife.

Ian L. Maw, Association of Public and Land-Grant Universities
Dr. Maw serves as Vice President, Food, Agriculture and Natural Resources at the Association of Public and Land-Grant Universities (APLU), a position he has held since 2005. He came to APLU in July 2003 following retirement from Rutgers University where he had spent 34 years of his academic career as a faculty member at Cook College in roles including chair of the departments of Environmental Sciences and Education, and associate dean for instruction, among others. In his role as Vice President at APLU he has the responsibility of leadership for the activities of several Commissions and Boards interfacing with both the APLU member institutions and federal agencies.

Jon Neutens, Weather INnovations
Jon is an accomplished business leader with experience in both small and large organizations that deliver research supported products and services to the agriculture community. Raised in the family ag-retail business, where he still serves on the Board, Jon has roots directly servicing growers. He has spent a good part of his career in the pesticide industry, migrating through various commercial leadership roles with Syngenta and its predecessors, and more recently as President & GM for Nufarm Canada, the sixth largest pesticide company in Canada. Jon has served on the boards of both CropLife Canada and CleanFarms Canada, Chairing the Chemistry Committee for the former and on the Executive Committee for the latter. A little over a year ago Jon jumped into the 'ag-tech' space, spending a great deal of time in consultative capacities with California based companies growing sensor, IoT, analytics, and decision support solutions for farmers. Jon is currently the President of Weather Innovations, a research-driven and field supported decision support solutions modeling company founded at the Ridgetown Campus of the University of Guelph. Jon holds and B. Sc. from the University of Guelph, and an MBA from the University of British Columbia.

Eric Ritchie, McCain Foods North America
Joining McCain Foods in 1989, Eric held a wide range of positions with the manufacturing group from waste treatment to production and maintenance to plant services. In 1997 he joined the agriculture group as senior supervisor of Valley Farms. In 2004 he was promoted to extension

agronomist. He transferred to McCain Foods USA, Inc. in 2007 as Agriculture Manager, before returning to McCain Foods Canada in 2011 as Agriculture Manager, NA Corporate Social Responsibility. He was promoted to Agriculture Manager NA Food Safety, Sustainability and Policy in 2012, and Sr. Agriculture Manager NA in 2016. Eric is responsible for farming integrity of raw agricultural commodities, including potatoes, onions, sweet potatoes and various other vegetable crops. A native of Greenfield, New Brunswick, Eric earned a B.S. degree in agriculture from Dalhousie University and a M.S. degree in sustainable food systems from Green Mountain College.

Rachel E. Schattman, University of Vermont Extension
Dr. Schattman works with the University of Vermont Vegetable and Berry Program as a Produce Safety Specialist. She also serves a post-doctoral fellow with the USDA Northeast Climate Hub. Her academic background is in agroecology, with a focus on sociology, community food security, and farm-based adaptive practices to climate change. She uses a participatory action research (PAR) approach in her research and outreach. She has expertise in qualitative, quantitative, and mixed-methods research design and analysis. Her experience owning and managing a diversified vegetable farm informs her perspective and research focus. The goal of her work is to support farmers to be more resilient in a changing climate, and contend with shifting regulatory landscapes.

Dennis Todey, USDA-Agricultural Research Service
Dr. Dennis Todey is the Director of the USDA Midwest Climate Hub in Ames. IA. The hub delivers actionable climate information for agriculture in an eight state region over most of the Corn Belt. He was the state climatologist South Dakota and Associate Professor at South Dakota State University. He has worked on regional climate services in the Missouri River Basin and Midwest for over a decade partnering with NOAA, Regional Climate Centers, state climatologists and state extension.

Todd Walter, Cornell University
Todd Walter is a Professor in the Department of Biological and Environmental Engineering, and Director of the New York State Water Resources Institute. His research emphasis is on the interactions between hydrology, ecology, and biogeochemistry. Dr. Walter applies physical hydrology and water resources engineering to a broad range of multidisciplinary research interests and pursues questions that cross the traditional academic boundaries of hydrology and terrestrial ecology.

Hank Venema, International Institute for Sustainable Development
Dr. Henry David (Hank) Venema is a professional engineer with a diverse technical and management background spanning climate change, renewable energy, water resources, urban planning, agriculture, operations research, public health and environmental economics. Dr. Venema's contributions to climate change, water resources and world food security have been recognized by the NATO Advanced Studies Institute, the International Water Resources Association, and a consortium of development agencies led by the World Bank. Hank's current research concerns the design and aggregation of precision green infrastructure on agricultural landscapes for regional-scale climate risk management and climate bond investment. Hank holds a PhD in Systems Design Engineering from the University of Waterloo.

Xeubin Zhang, Environment and Climate Change, Canada
Xuebin Zhang is a Senior Research Scientist with the Climate Research Division of Environment and Climate Change Canada. His research focuses on changes in weather and climate extremes, including documenting past changes, understanding the causes, and projection for the future. He is a co-chair for the joint CCl/WCRP/JCOMM Expert Team on Climate Change Detection and Indices and the WCRP Grand Challenge on Weather and Climate Extremes. He is an Associate Editor for the journal Weather and Climate Extremes. He served as a Lead Author for the IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation and a Lead Author for the IPCC Fifth Assessment Working Group I Report.

Lewis Ziska, USDA-Agricultural Research Service
Dr. Ziska is a Plant Physiologist with the USDA's Agricultural Research Service in Beltsville, Maryland. After graduating from the University of California, Davis, he began his career as a Smithsonian fellow, and then took up residence as the Project Leader for global climate change at the International Rice Research Institute in the Philippines before joining USDA. Since joining USDA, Dr. Ziska has published over 100 peer-reviewed research articles related to climate change and rising carbon dioxide. He is a contributor to the 2014 International Panel on Climate Change report (Food Security Chapter and *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. He is the author (with JS Dukes) of Weed Biology and Climate Change (Wiley Press), and the editor (with JS Dukes) of Invasive Species and Climate Change (CABi Press). His work has appeared in *Scientific American, USA Today, CBS Nightly News, CBS' Sunday Morning, National Geographic, Politico, The New York Times, and The Wall Street Journal*