CANADA/U.S.
FOREST HEALTH INITIATIVE

YEAR-END REPORT

2013/14

One Continent; One Forest; One Threat:
Early Achievements and Impacts of Enhanced Collaboration

Canada-U.S. Forest Health Initiative

ONE CONTINENT; ONE FOREST; ONE THREAT: EARLY ACHIEVEMENTS AND IMPACTS OF ENHANCED COLLABORATION

1.0 Introduction

1.1 Context

Canada and the United States share many ecological, socio-economic and other commonalities, and have similar needs with regard to forest science and forest products research. Historically the two countries have benefitted greatly from pooling their expertise on selected issues. However, there is now a growing opportunity for shared benefit in light of more complex challenges in and around our forests, as well as comparatively fewer resources to deal with them.

Understanding that climate change is compounding our need for timely and cost-effective tools to respond to increasing risks of pests, diseases, and pollutants, the Canadian Forest Service (CFS) and the US Forest Service (USFS) sought participation in the exploration and development of a cooperative vision, and a plan for shared specific actions that could help meet the forest health challenges facing both nations. In an era of increasingly complex challenges for the forest sector, as well as for the forests, in both Canada and the US, effective collaboration between CFS and USFS will allow the two organizations to capitalize on each other's knowledge and capacities.

1.2 Forest Health Summits

To begin the dialogue around common forest health issues, two Forest Health Summits were organized in 2012/13. Participants included scientists and management from the Canadian and American forest services, as well as industry representatives and other stakeholders. Each Summit was hosted by the US Endowment for Forestry and Communities, an important partner in this initiative.

Summit I (Washington, June 2012) was convened in order to identify forest health challenges that are of strategic importance to the North American forest sector that would benefit from enhanced bilateral engagement and collaboration. In the context of this first Summit I, Canada's Minister of Natural Resources highlighted that "by identifying issues we can work on together, we aim to maximize the value of the critical work that scientists and researchers are doing on both sides of the border to ensure the health of our forests and forest sector."

Summit II (Ottawa, March 2013) was convened for the purpose of developing specific recommendations to implement a vision for enhanced, strategic collaboration to address burgeoning forest health threats across both countries. Summit II allowed key forest sector players, including funders, creators and users of forest science and technology in Canada and the US, to agree that efforts should focus on the areas of forest pests, wildland fires, forest inventory and analysis, enhanced used of wood in construction and, genomics applied to forest sector needs.

1.3 Governance

The Delivery Team meets via teleconference about every two months (or as needed) and includes members from CFS (Jacques Gagnon, Marie Anick Liboiron, and Erica Johnson), USFS (Carlos Rodriguez-Franco) and the US Endowment (Carlton Owen). The team's responsibilities include communicating the goals and achievements of the initiative, keeping the Advisory Committee up to date on progress and seek advice when necessary, coordinating and planning initiative activities and ensuring delivery of short list projects for 2013/14, staying connected with working groups and project leads, re-engaging Summit participants, coordinating the development of a short list of projects for 2014/15, and organizing international meetings/workshops as necessary.

The Advisory Committee meets via teleconference about twice a year (or as needed) and includes members from CFS (Javier Gracia-Garza, Jacques Gagnon and Lise Caron), FPInnovations (Jean-Pierre Martel), USFS (Tom Martin and Jim Reeves), and the US Endowment (Carlton Owen). The role of the Committee is to provide advice, oversight, and strategic direction to keeping the initiative moving towards its ultimate goal of creating a bi-national forest health research agenda. Committee members also act as liaison with forest sector partners.

2.0 Achievements and Impacts

Following Summit II, staff from both Forest Services met in Washington, DC, in June 2013 with the aim of identifying specific projects that would lead to short-term results. It was agreed that the main short-term actions should allow the Chiefs to have confidence in the ongoing collaborations by highlighting existing work in areas of importance to both countries. A short-list of projects for 2013/14 was developed and provided to the Chiefs for consideration in August 2013.

Significant progress was made on many of the 2013/14 short-list projects. A summary of early achievements and impacts are highlighted below.

2.1 Markets: Enhancing the use of wood

Projects under this theme seek to combine efforts to increase markets for American and Canadian wood products and demonstrate that the two countries can work together to mutual benefit in this priority area. Four projects were proposed under this theme for 2013/14.

2.1.1 Promotion of mid-high rise wood buildings

With the arrival of modern engineered wood products including mass timber and systems, mid- and high-rise wood buildings are slowly attracting considerable attention from designers, clients, developers and governments. Mass timber products include glued-laminated timber (glulam), structural composite lumber (SCL) and cross laminated timber (CLT).

Achievements

During the past year, Canadian and American researchers met via conference calls several times to discuss a common approach to addressing research needs on both sides of the border. Such efforts were mainly focused on how to facilitate acceptance of mid- and high-rise wood buidlings in their respective country building codes. The following are some key areas where progress has been made.

- In Canada, the growing pursuit of more sustainable methods of construction triggered an initiative to support tall wood building demonstration projects (10 storeys and taller). As part of this initiative, funding was provided to FPInnovations to develop the first edition of a"*Technical Guide for the Design and Construction of Tall Wood Buildings in Canada*". The Guide supports the design and construction of tall wood buildings and provides information to the Authorities Having Jurisdiction (AHJ) to help facilitate code acceptance.
- Similar efforts are happening in the US where federal funding was announced recently to implement a tall wood demonstration building program. In addition, a collaborative initiative between both Canada and the United States is being discussed to develop a Tall Wood Technical Design Handbook in the US.
- In order to facilitate the adoption of CLT in Canada, NRCan provided funding to FPInnovations to lead the development of a Canadian edition of a CLT handbook. The broad acceptance of the Canadian CLT handbook in Canada encouraged the development of a US CLT edition. With funding from government and industry organizations in both Canada and the US, a US Edition of the CLT handbook was developed. The two handbooks provide immediate support for the design and construction of CLT assemblies in Canada and the US targeting mid-high rise and non-residential construction markets. The implementation of CLT in North America marks a new opportunity for cross-border cooperation, as five organizations worked closely together with the design and construction community, industry, universities and regulatory officials in the development of the US CLT handbook.
- The two countries are working together along with the forest industries in both Canada and the US to financially support the US Wood Works Program. During the year, the US government made an announcement to financially support the Program (which has been financially supported by the Canadian government since 2007). The US Wood Works Program provides

training for architects, engineers and builders on how to use advanced wood materials in US buildings, and is closely linked to a similar program delivered in Canada.

Future Work

- Continue to strengthen current efforts on collaborative research between FPInnovations, US Forest Products Laboratory (FPL) and universities in certain areas (e.g., structural, fire, serviceability, durability, environmental and sustainability, etc.).
- Transfer of information through joint publications, design guidelines, handbooks, fact sheets, webinars, workshops (lead by WoodWorks in Canada and US) and code change proposals led by the Canadian Wood Council (CWC) and the American Wood Council (AWC).
- Proposed development of a US Technical Guide for Tall and Large Wood Buildings by US FPL, FPInnovations, AWC, American Plywood Association (APA) and WoodWorks with engagement from the US design and construction community and universities (modeled after the Canadian Guide for Tall Wood Buildings).

2.1.2 Development of timber bridge market

The wood industry is currently exploring new opportunities for expanding the use of wood in non-traditional construction markets. Timber bridges have been identified as alternative market opportunities that the industry should be seeking. Timber bridges are expected to offer the same standard of structural performance and lifespan as bridges made of steel and/or concrete, for the different types of bridges, be it pedestrian, railway or highway overpasses. A brief summary of recent specific activities related to timber bridges is given below.

Achievements

- Considerable efforts invested by the US over the last 10 years in R&D associated with the timber bridges development under the US Department of Transportation-Federal Highway Administration (FHWA) programs with involvement from US FPL.
- Canada completed a preliminary market study showing that the construction market for bridges is undergoing a change which has the potential of positioning wood as a viable alternative in the choice of building materials.
- The US organized an international symposium on timber bridges (ICTB) in Las Vegas in October 2013 which shared new research findings and technologies with an international audience. Good participation from both the US and Canadian wood industries and various design and research groups.

Future Work

- Carry out collaborative research by FPInnovations and the US FPL to develop technical information to support the development of timber bridges market in Canada and the US. Specific joint research topics with potential collaboration could include:

- Design of composite wood-concrete bridges (i.e., structural, durability, etc.);
- Dual treatment (borate/oilborne) of softwood timbers and glulam for extended service life;
- Continue to develop analysis, inspection and maintenance/repair techniques of existing and future timber bridges and development of non-destructive testing techniques (NDE);
- Explore the possibility of publishing a joint North American Timber Bridge Sourcebook to assist designers, cities and counties in Canada and the US.

2.1.3 Environmental product declarations

Environmental product declarations (EPDs), which are based on a product's life cycle assessment (LCA) data, are designed to provide accurate, accessible and comparable information on the environmental impacts associated with the product (or system). Much like nutritional food labels, EPDs promote transparent communication of environmental data to enable comparison between products. Both the Canadian and the US wood products industry is taking a leadership role by adopting EPDs to advance environmental considerations and values in the building construction sector.

Achievements

- EPD's for particleboard (PB) and medium density fibre board (MDF) were completed with information provided by FPInnovations and the US FPL.
- Previous EPD's (completed prior to the Canada/US initiative) included LVL, wood I-joists, OSB, glulam, softwood lumber and softwood plywood.
- CFS and USFS issued a joint press release about the completion of these new EPDs, which can be found on Canadian and American Wood councils websites:
  - http://cwc.ca/green/epds/
  - http://www.awc.org/greenbuilding/epd.php

Future Work

- Publish and distribute the PB and MDF EPD's.

Impacts

- Joint North American EPDs make sense as Canada and the US share common forest types and produce common products. It is an efficient use of our resources and time to combine our EPDs and this will lead to strengthened markets and use of wood in both countries.
- EPDs also give an objective measure of the environmental impact of material and allow people to see the benefits of using wood, which is increasingly important for European markets.

2.1.4 Nanotechnology

The USFS and the CFS have worked collaboratively in international standards development of cellulose nanomaterial.

Achievements

- In the International Organization for Standardization (ISO) Technical Committee 229 (TC229) Nanotechnologies, coordinated efforts from US and Canadian leaders have resulted in the Technical Committee (TC) including standards development for cellulose nanomaterial in the resolution of their November 2013 Brazil meeting.
- In ISO TC6 Pulp, Paper and Board, US and Canadian experts are working collaboratively in an ad-hoc group on cellulose nanomaterials. The ad-hoc group will advise the entire TC6 on standards development for cellulose nanomaterials.
- US and Canadian experts are also participating in each other's cellulose nanomaterial standards development projects; for example, Canadian experts are participating in the US Technical Association of the Pulp and Paper Industry (TAPPI) terminology project and US experts are participating in the Canadian Standards Association (CSA) characterization project. Both the TAPPI and CSA projects are in the final stages of standards development.

Impacts

- This cross-border collaboration in cellulose nanomaterial standards development will result in harmonization of standards between US and Canada; it will also remove trade barriers and promote harmonization of regulations and policies between the two countries.

2.2 Fire: Enhancing capacity to assess and respond to risk

Projects under this theme seek to better coordinate the resources and approaches of the two Forest Services in the face of increasingly severe fire seasons in both countries. Two projects were proposed under this theme for 2013/14.

2.2.1 Updating Canada-US agreement for collaboration on forest fire

Achievements

- In November 2013, Canadian Officers meet with Forest Aviation Management and Research and Development in USFS Headquarters to work on updating the Canada-US agreement for collaboration on forest fire. The wildland fire arrangement between the Government of the United States of America Departments of the Interior and Agriculture and the Government of Canada and the Governments of the Provinces and Territories of Canada is still in effect and the Annual Operating Plan has been reviewed and will be ready for signature this year.

- The USFS is working with CFS in developing smoke modeling for British Columbia and is working to expand it to Canada.

Impacts

- A coordinated approach to the sharing of wildland fire fighting resources.

2.2.2 Analysis of response capacity under extreme circumstances

Achievements

- Key US and Canadian fire experts met in April 2014 and developed the plan for a desktop exercise, to be done in November 2014, which will produce a joint response process in the event of an extreme North American-wide wildland fire circumstance. The process will enable CFS and USFS to coordinate efforts to seek wildland fire resources outside of North America.
- Discussed an approach to develop an integrated fire danger rating system for both countries. Three major efforts were identified.
    - Short term: Developed a North American fire danger map with 5 classes to have a common map based Canadian and American information. The map is complete, see Annex 2.
    - Medium term: Share real time information from both countries about meteorological conditions and fuels, blend them and produce a common map for fire danger system.
    - Long Term: Develop a system to share data developing meteorological indexes with no geographical boundaries and redo the models to produce the maps.

Impacts

- A more coordinated and updated approach to recognizing and responding to extreme wildland fire conditions in North America.

2.3 Pests: Tools and approaches to mitigate risks related to pathways and epidemics

Projects under this theme seek to enhance joint capacity for forest pest management (detection, prevention, control). The ultimate goal is to develop a collaborative framework involving other Canadian and US agencies such as the Canadian Food Inspection Agency (CFIA), the Health Canada Pest Management Regulatory Agency (PMRA), the US Animal and Plant Health Inspection Service (APHIS), and US Environmental Protection Agency (EPA). Two projects were proposed under this theme for 2013/14.

2.3.1 Customizing phytosanitary standards e-learning courses to North America

Achievements

- The Food and Agriculture Organization's (FAO) developed two interactive e-learning courses – *Good practices for forest health protection* and *Trade in forest commodities and the role of phytosanitary measures* – for anyone wishing to learn about the importance and relevance of phytosanitary measures and to make the key messages of the *Guide to implementation of phytosanitary standards in forestry* even more accessible and useful.
- The project was completed in March 2014 with the help of input from subject matter experts from CFS, USFS and CFIA. The courses are now available in both English and French. The FAO has approved the North American versions of the two e-learning courses and is prepared to post them on their website.

Impacts

- The purpose of customizing these two existing e-learning courses for North America was to make them better suited to the specific needs of the region and therefore have more impact on the implementation of phytosanitary standards in Canada and the US.

Future Work

- The possibility of translating these two courses into Spanish is currently being explored by the USFS, to increase the accessibility of these customized courses in both the US and Mexico.

2.3.2 Building synergies in spruce budworm science to address emerging epidemics

Achievements

- CFS hosted a Canada-US Working Meeting on Forest Health Research Collaboration (Quebec City, February 2014) with experts from both Forest Services. The objective of this meeting was:
    - To reach a common understanding of the realities and challenges in the area of forest health, with specific focus on forest pests and spruce budworm and identify areas where closer collaboration would enhance efficiencies in addressing high-visibility forest health issues on both sides of the border.
    - To develop the scope of a bi-national research agenda on spruce budworm outlined based on the strategy of each country. They developed a set of areas of future collaboration and deliverables with the objective of to use our strong scientific knowledge foundation in order to develop a harmonized approach to assess risks that increases our collective capacity to address spruce budworm outbreaks.

- After two half days of discussions, the group proposed the following four projects for enhanced or new collaboration on spruce budworm that could be undertaken over a 1.5-2 year timeframe:
    1. Accelerate the completion of spruce budworm atmospheric transport modelling in order to fill in critical knowledge gaps in our understanding of factors contributing to outbreaks development and spread.
    2. Explore harmonization opportunities for spruce budworm monitoring across jurisdictions.
    3. Accelerate the development of spatially implemented spruce budworm population dynamics simulation model for use in LANDIS (a forest landscape disturbance and succession model)
    4. Create a harmonized Canada-US hazard and risk map for spruce budworm building on existing methodology and data developed by USFS (National Insect Disease Risk Map initiative – NIDRM)
- Project co-leads prepared short formal proposals, projects 1 and 3 were approved by the Delivery Team in May 2014. Actual work on these projects will start later this summer. The two other projects require more thinking and discussion among experts within and beyond the two Forest Services.

Impacts

- The short-term collaborations going forward focus on very specific areas of spruce budworm research, but pilot projects are essential to assess the way we work together and adapt it to more formal and structured approach. It is also anticipated that results from those projects will be applicable at broader scales which opens the door for more strategically-oriented collaboration to address forest pest challenges in the future.

2.4 Forest Inventory: "Putting both sides of the border on the same map"

Projects under this theme seek to explore approaches to harmonize knowledge of forest resources. By expanding to Canada the current special study underway by the US Forest Inventory and Analysis Program to develop "next generation" tree species biomass equations by collaborating with CFS research centres. The ultimate goal is that US and Canadian biomass and carbon estimates along with tree species abundance will become more consistent and provide a stronger North American foundation for our respective country's negotiation in international forest carbon sequestration dialogues. The development of diverse shared map products from the data is a focus that would benefit both countries. One project was proposed under this theme for 2013/14.

2.4.1 Integrated North America map of forest biomass in context of climate change

Achievements

- In order to advance on-going efforts to generate a continuous Canada-US map of above-ground forest biomass and above-ground carbon an initial meeting between CFS and USFS scientists took place in July 2013 to scope out this initiative and plan a way forward.
- An initial version of an integrated map of North America including Mexico has been created and was developed within the CFS Forest Change project. This latest version of the North America forest biomass map is now available (see Annex 3). Scientists have quantified the level of agreement of the constituting maps and are currently working on the next iteration of these maps by improving precision, eventually including tree species abundance, and using higher resolution data, towards developing the most harmonized suite of North American forest map products possible.

Impacts

- The provision of continuous maps of forest properties such as biomass, but eventually of tree species-level abundance/biomass, will support an increased alignment of forest reporting methodologies between the two countries, in addition to improving forecasts of cross-border propagation of host-dependent invasive species and allow for more efficient response.
- The creation of such a map is the first step in the generation of additional maps of forest properties for common analysis of forest dynamics.

2.5 International: Reaching beyond North America

Projects under this theme seek to develop a combined regional reporting regime that allows Canada and the US to more accurately identify and report on issues shared by the two countries. Two projects were proposed under this theme for 2013/14.

2.5.1 FAO Global Forest Resources Assessment 2015

Achievements

- Canada, the US and Mexico collaborated in the development of improved reporting categories and harmonized regional approach to reporting on protective functions and ecosystem services for the 2015 FAO Global Forest Resources Assessment (GFRA).
- Members of the CFS and USFS met several times between October 2011 and March 2013. Then in late 2013, at a meeting of the Inventory, Monitoring and Assessment Working Group (IMWG) of the FAO's North American Forest Commission (NAFC), the three countries compared and aligned, as much as possible, their responses to the GFRA questionnaire.

- The IMWG is also developing a new integrated North American forest reporting database that will provide harmonized forest reporting at the level of CEC eco-regions. This will enhance understanding of North American forest circumstances beyond that provided by GFRA. IMWG will present latest developments on this project at the IUFRO 2014 World Congress.

Impacts

- The 2015 GFRA report is due to be published in September 2015. This coordinated approach was a very effective and both countries are confident that a similar process will be used again for future reports.

2.5.2 FAO State of the World Genetics Resources

Achievements

- CFS and USFS took an integrated approach the latest FAO State of the World Genetics Resources report and worked to jointly prepare a regional (i.e., North American) report.
- CFS researchers worked closely with their USFS counterparts, identifying common denominators for reporting in both countries. Now that the relationship has been established, both countries will have access to more information of this type.
- The study titled "North America: Regional Synthesis on the State of the World's Forest Genetic Resources" has been finished and it has been sent to FAO. Both the USFS and CFS will attend the FAO Commission on Genetic Resources for Food and Agriculture, ITWG on Forest Genetic Resources meeting in July 7 to 9th, 2014.

Impacts

- This is the first time this type of coordinated regional report has been done, and the FAO is showcasing it as the standard for other regional forest commissions to follow.
- The real advantage of this collaboration is the new regional level info that is now available. New opportunities to expand/extend collaboration may be identified in spring 2014, when the NAFC Forest Genetics Resources Working Group meets.

3.0 Next Steps

3.1 Projects for 2014/15

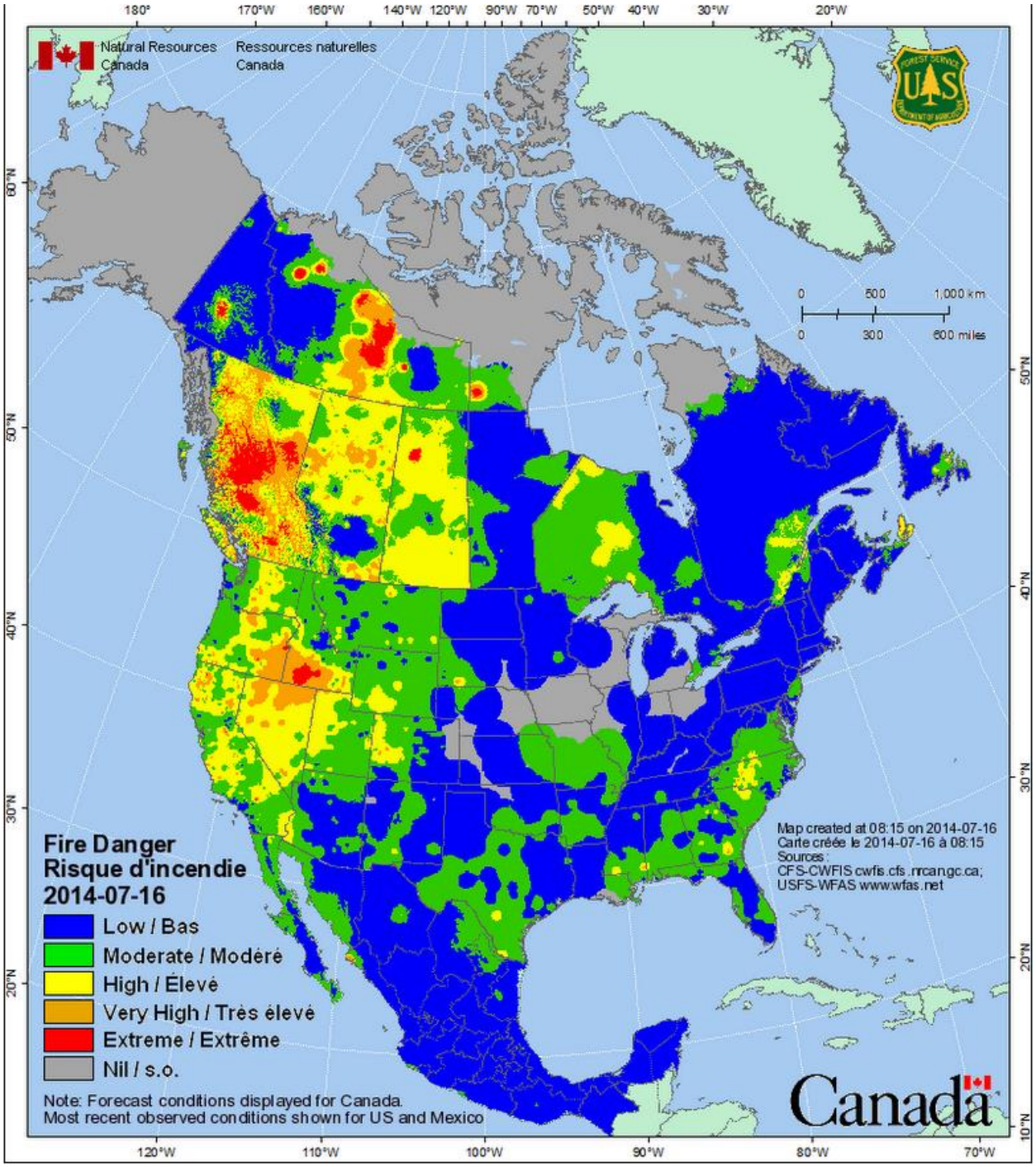
In July 2014, the Delivery Team will review the med/long-term list of projects developed in 2013 to determine if they still fit with each organization's respective priorities and use this as a starting point for developing a short-list of projects for 2014/15. The team will then host a conference call with the Advisory Committee in August 2014 to present the 2013/14 Year-End Report and review the proposed

short-list of projects for 2014/15. The Delivery Team plans to organize a meeting in September 2014 to re-engage the broader community (i.e., Summit participants, etc.) and develop a plan for the next 2-3 years by evaluating what has been achieved so far and how the needs of each organization have shifted since Summit II, and identifying opportunities to continue to move towards developing a binational forest health research agenda.

Annex 1 - Short list of projects for 2013/14 and those involved

		CANADA		USA	
Theme	**Project**	**Primary Contact**	**Others Involved**	**Primary Contact**	**Others Involved**
Markets	Promotion of mid-high rise wood buildings	Bob Jones	Mohammad Mohammad	World Nieh	Mike Ritter
	Development of timber bridge market	Bob Jones	Mohammad Mohammad	World Nieh	Mike Ritter
	Environmental product declarations	Bob Jones	Mohammad Mohammad	World Nieh	Mike Ritter
	Nanotechnology	Bob Jones	Matthew Schacker	World Nieh	Theodore Wegner
Fire	Updating Canada-US agreement for collaboration on forest fire	Ken Mallet Kim Connors	Richard Carr John Little Bruce Macnab	Dale Dague	Colin Hardy
	Analysis of response capacity under extreme circumstances	Ken Mallet Kim Connors	Kerry Anderson Steve Taylor	Dale Dague	Colin Hardy
Pests	Customizing phytosanitary standards e-learning courses to North America	Marie Anick Liboiron	Erica Johnson	Carlos Rodriguez - Franco	
	Building synergies in spruce budworm science to address emerging epidemics	Lise Caron	Rob Johns Michel Cusson Jacques Regniere Barry Cooke Vince Nealis KeesvanFrankehuyzen Jean-Luc St-Germain Marie Anick Liboiron	Brian Sturtevant	Frank Sapio Ralph Crawford Laura Kenefic Robert Rabaglia Dee Hines
Forest Inventory	Integrated North America map of forest biomass in context of climate change	Pierre Bernier Andre Beaudoin	Luc Guindon Denys Yemshenov	Rich Birdsey	Rich Guldin Greg Reams
International	FAO Global Forest Resources Assessment 2015	Joanne Frappier	Jeff Dechka Simon Bridge Graham Stinson	Rich Guldin	Greg Reams Sonja Oswalt W. Brad Smith
	FAO State of the World Genetics Resources	Tannis Beardmore		Randy Johnson	

Annex 2 – Fire Risk Map



Annex 3 – North American Above-Ground Forest Biomass Map