CLIMATE CHANGE ADAPTATION PLANNING FOR NORTHWEST SKEENA COMMUNITIES

PROJECT UPDATE

FORESTS, FISH, CLIMATE & COMMUNITY

The C-CAP project enters its final phase to link all the pieces together and lay the foundation for adaptive action.

Over the last 18 months many of you may have been contacted by, or participated in the Climate Change Adaptation Planning Project in a number of ways. The sociological research team from UBC has now completed over 100 interviews across the communities of Terrace, Lax Kwa 'alaams and Prince Rupert. In addition, a process for monitoring Fisheries Sensitive Watersheds was piloted in the Lakelse area with the help of a dedicated group of stakeholders, including local environmental groups, government representatives, and volunteers. Work by climate change and vegetation modeling experts will be integrated with the findings of social scientists, bringing a range of potential climate impacts to light based on varying climate scenarios.

Over the next few months, this work will be pulled together in a number of formats to be presented, debated, and acted on by audiences including local leaders, citizens, government and industry and environmental experts. This will include a series of interactive workshops, technical reports and executive summaries, and computer software that will contain the findings and results of the study for use by multiple audiences. This newsletter briefly describes a number of recent activities. For more detailed information, please see the project website: http://brinkmanforest.com/ffesc, or check out the contact details on the back.
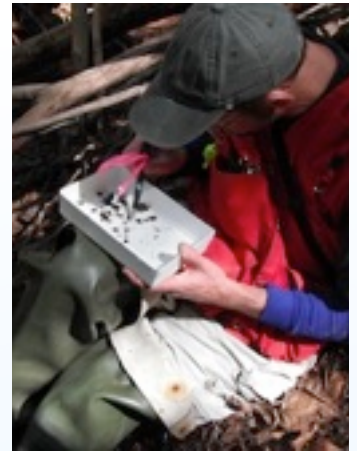
FSW Monitoring Pilot and Field Work

Marc Porter of ESSA Technologies examines water samples in the Lakelse during the FSW training and monitoring pilot work conducted this spring. A second phase of field work is set for September 2011.

FSW MONITORING PILOT

FSW: Fisheries Sensitive Watershed
A legal designation applied to an area of land making up a watershed. In order to qualify as an FSW, a waterway must have significant fisheries value and watershed sensitivity. An FSW designation serves as a forest management planning requirement to consider the range of values and sensitivities entailing special management in order to conserve fish habitat values

FREP: Forest and Range Evaluation Program A results-based approach to evaluate effectiveness of forest and range practices in achieving sustainable resource management.

On May 24th, participants representing several levels of government, environmental groups, and the natural resource industry met in Terrace to begin a four day watershed data collection training program. The training, part of a C-CAP watershed monitoring pilot, focused on FREP Riparian and Water Quality field protocols, and a MOE Fish Passage field protocol. Trainers were Derek Tripp, Brian Carson and Dave Maloney and Richard Thompson. Training on the FSW approach to sample site selection was also provided by Darcy Pickard and Marc Porter of ESSA Technologies Ltd.

Following the training, 10 days of intensive field data collection was undertaken in parts of the Lakelse drainage. Field crews met daily at the local Forest Service office, where the day's sampling work was assigned using unique pre-selected sample site locations down-loaded onto each crew's GPS unit. A total of 38 sites within the Williams Creek and Lakelse mainstem watersheds were sampled over the data collection period and there are plans to collect additional data during another data collection session in September.

Many parts of the Lakelse drainage were inaccessible in May/June due to low-lying snow packs and high water conditions in several rivers. However, the initial field work for the pilot was considered highly successful because much was learned; both in regards to data collection for the Lakelse area C-CAP project itself, and for informing development of a broader watershed monitoring protocol that could be used regionally.

It is anticipated that information derived from the C-CAP pilot will lead to development of a multi-tiered watershed condition monitoring protocol using a geographic information system (software and agency GIS layers) and field data. Collecting information in this fashion, and over-time, will help better understand a watershed's condition associated with pressures ranging from local development activities to climate change. Moreover, monitoring of this kind can help managers and the public make informed management decisions in a way that provides the greatest benefits (water quality, fish, timber, recreation, etc.).

Many thanks go out to the all the crews who lent their time and provided their own transportation and equipment to make this endeavour a success. For more detailed information on the pilot and the upcoming September field work, please visit the project website at http://brinkmanforest.ca/ffesc/ fsw. The following tables summarizes some of the key accomplishments of the pilot.

Local C-CAP data needs	Broader FSW monitoring design
☑ Trained a variety of agency staff and local volunteers in FREP/MOE protocols necessary for habitat data collection in the Lakelse drainage, who can be called on for assistance with subsequent monitoring efforts	☑ Demonstrated that large numbers of participants can be sufficiently trained within a condensed 4 day training period in all three of the field sampling protocols (riparian, water quality, and fish passage) that will be used for FSW monitoring
	☑ Explored alternative sampling design approaches to piggybacking sample site selection across the 3 protocols.
☑ Collected stream/riparian habitat quality information at 38 riparian sample sites and associated nearby stream crossings for water quality and fish passage information. This data can be used to inform our analyses of current habitat condition across the sampled Lakelse watersheds.	☑ Determined adjustments to standard FREP/MOE sampling protocols that will need to be made to better customize data interpretations for FSW monitoring needs
	☑ Determined the staff/equipment commitments required to undertake broad scale sampling across whole watersheds
☑ Successfully collected data across a range of pre-selected and GIS-derived sampling strata (fish habitat vs. non-fish habitat, close to road vs. far from road, cutblocks of different age categories)	☑ Determined the time/manpower required for sampling of each selected FSW site and the number of sites/day that can feasibly be undertaken by a dedicated field crew
	☑ Field-assessed the actual level of resolution/accuracy of our GIS-derived sampling strata and have determined appropriate adjustments that will need to be made to generate more accurate/useful sampling strata for subsequent sampling efforts in Lakelse and other FSWs.

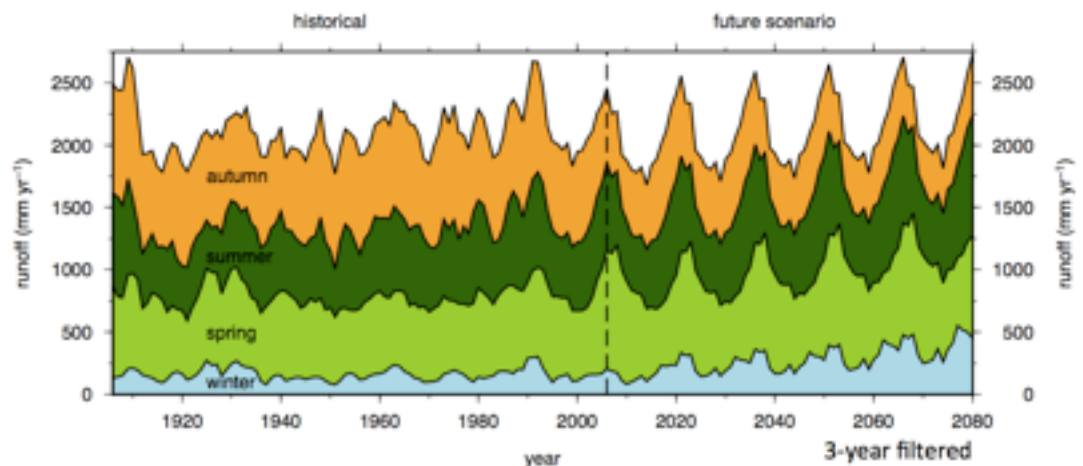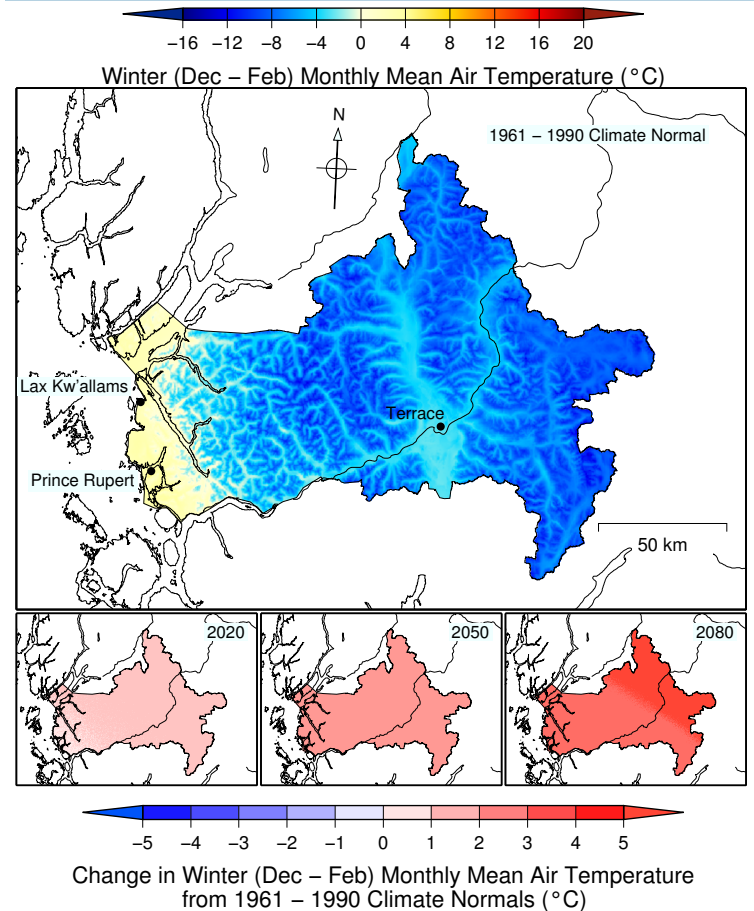# VEGETATION MODELLING IN THE SKEENA REGION

Initial Outputs from Dynamic Global Vegetation Model Released
Preliminary findings from A2 Climate Scenario shared at Columbia Basin Institute Conference

As part of the C-CAP project, Drs Jed Kaplan and Joe Melton have customized a vegetation model called LPJ-Guess for application to the North West Skeena study area. This model can be used to analyze how different climate scenarios could impact hydrology, carbon storage, forest composition, and the frequency of disturbances or extreme events.

Because of the uncertainty around future emissions, different scenarios, or story-lines, have been developed based on different futures. For example, the world may undergo an increase or decrease in the use of fossil fuels, which will significantly impact the level of climate change in the future. This means that the projections from model runs are only 'possible futures' and no single scenario can be taken as a definite future. However, they can be helpful in monitoring changes in certain indicators, and anticipating how the forest might look under certain conditions.

The initial outputs for this project are based on running the model under the A2 climate scenario, which projects a warmer and wetter future for the region. Using local data, the model is able to demonstrate historical trends, and then to apply information from climate scenarios to project possible future trends. Dr. Kaplan presented preliminary results from model runs at the Columbia Basin Institute in June, 2011. Projections based on the A2 scenario include a decrease in arctic tundra as predominantly western hemlock forests expand to higher elevations. Under this scenario, the most significant impact could be on on hydrology, as winter rainfall and runoff increase and snowfall decreases (See Graph 2, bottom). Carbon is projected to remain relatively stable in the region. Final outputs will be presented during community workshops in early December. A summary of Dr. Kaplan's presentation is available on the project website: http://brinkmanforest.com/ffesc

Winter (Dec – Feb) Monthly Mean Air Temperature (°C)

Change in Winter (Dec – Feb) Monthly Mean Air Temperature from 1961 – 1990 Climate Normals (°C)

Under the A2 Scenario, increases in spring and winter runoff contribute to an overall increase in annual runoff.

SOCIAL SCIENCE

Interviews complete in 3 communities

Since November 2010, the Social Science team from UBC has been conducting interviews in the communities of Terrace, Prince Rupert and Lax Kw'alaams. Participants in these interviews have included political, economic and social leaders in the community, residents with long standing involvement in forest and fishery resource work and activities, and long-time residents and elders.

A key element of the sociological research is understanding what the the residents of each community value about their community, what they value about their local natural resources, and what they view as the future of their community and the local resources around it. In particular, we are interested in identifying whether there are differing views in and between communities about the future of their local resources and the future of their communities as a result.

Preliminary analysis suggests that many interview participants view climate change as being less influential to the region as compared to other drivers of change, such as first nations treaty settlement, small business development, and the global economy.

One goal of the project will be to assess how perceptions of climate change are altered once participants have been presented with localized scientific information about the potential impacts of climate change on their natural resources and environment. This information will be presented through workshops in December, based partially on suggestions from interviewees on the types of information that they would like to see. Future analysis of the interviews will look deeper into the capacity of Skeena communities to adapt to climate change. Detailed findings and results will be presented in individual reports for each community.

More information about the December workshops, along with outputs from all phases of the project, will be available soon on the project website:
 https:brinkmanforest.com/ffesc

The research team greatly appreciated the opportunity to meet and learn from citizens of Prince Rupert, Lax Kw 'alaams, and Terrace.
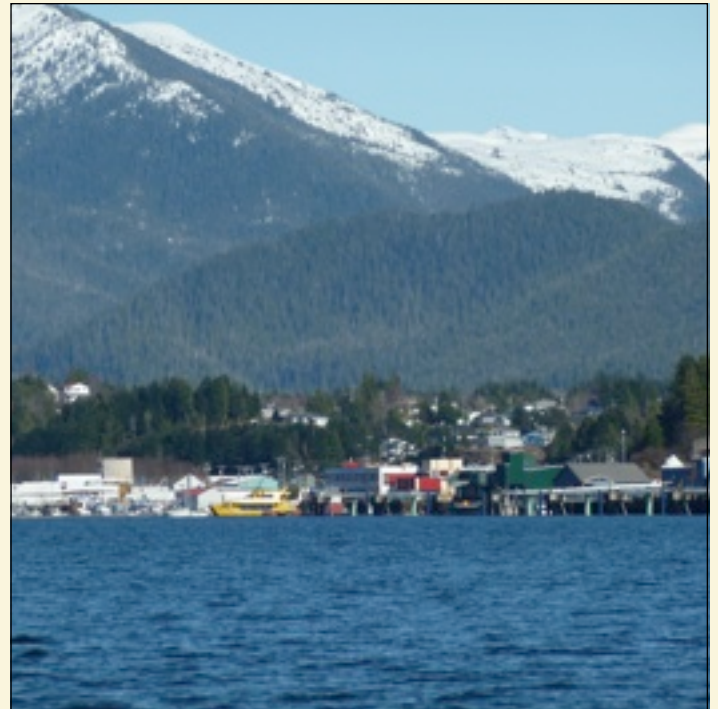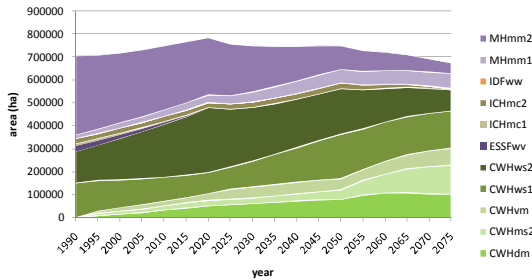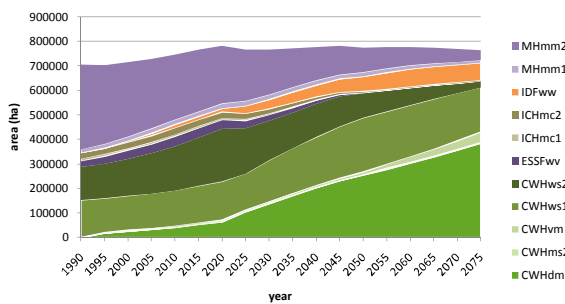
Photos:
Top Prince Rupert from the Habour (K. McPherson), Bottom left, Lax Kw 'alaams (G. Piggot), Bottom right, Terrace (www.terrace.ca/gallery/city_of_terrace).
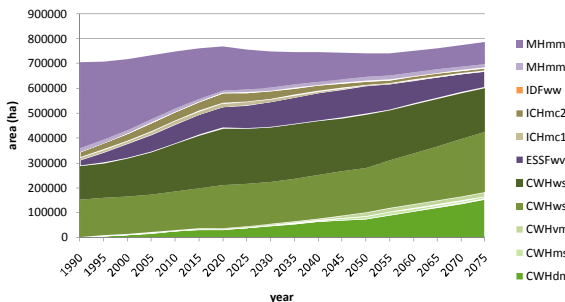
SKEENA RIVER WATER CONSERVATION PROJECT

CC scenario: CGCM3-A2 (warmer & wetter)
Area - total

CC scenario: HadGEM-A1B (warmer & drier)
Area - total

CC scenario: HadGEM-B1 (somewhat warmer & wetter)
**Area - total**

The graphs above represent possible impacts of three different climate scenarios on total area of different biogeoclimatic (BEC) zones. Graph 1 shows the A2, or business as usual scenario projecting a warmer, wetter climate. Graph 2 shows the A1B scenario of a warmer and drier climate, and Graph 3 represents the B1 scenario that projects a somewhat warmer and wetter climate. Graphs like this can be useful in strategic thinking about possible future management options, but cannot be used as operational planning tools.

Climate change impact scenarios constructed for Terrace region

The Skeena River Watershed Conservation Project is linked to the larger FFESC project, but with a more specific focus on forest and water resources in the Kalum TSA and TFL 1. Led by World Wildlife Fund in cooperation with Coast Tsimshian Resources, this project is also guided by the input of a wider advisory group with representatives from Kitsumkalum, Gitanyow, Terrace, Prince Rupert, and Lax Kw 'alaams.

The cumulative effects tool used for this piece of the project has been developed by Cortex Consultants and can be used in a number of ways. One way that the project intends to use the model is through strategic scenario-based planning activities, in which different climate futures are explored in combination with local objectives and goals for land and resource use in the region. Scenario-planning is widely used in business and politics as practice for real-life challenges, helping to build relationships and open lines of communication between the people and groups who will be called upon in the future to work together. Scenario-based activities that include a range of local experts and stakeholders can be used to identify areas of mutual concern and to promote conversation around challenges and solutions regarding the environment and natural resource industries.

The outputs from running three different climate change scenarios show three very different futures. While this means that the model cannot yet be used for operation planning, it also shows the need for flexibility and creativity in planning for an uncertain future.
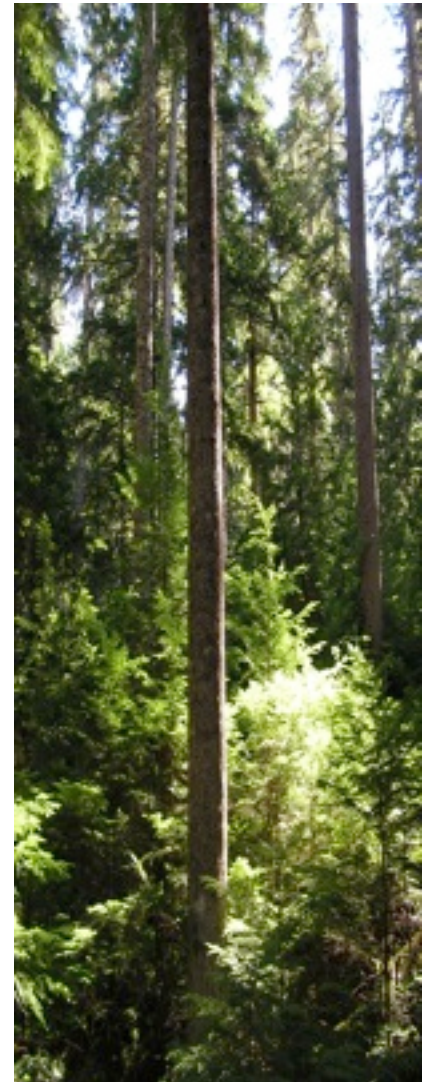
These scenarios can also be used to identify indicators that can be monitored in the future to track the direction of climate change and plan accordingly.

In Fall 2011, plans are underway to bring together local experts for constructive conversation about the impacts of different climate scenarios, and to set parameters for locally based scenarios. More results of the climate change impact analyses will be released in the fall.

INTERESTED IN LEARNING MORE?

The Skeena River Watershed Conservation Project is part of the Regional Adaptation Collaborative that will enable Canadians to be better prepared to adapt to changes in the climate by providing them with adaptation knowledge, tools, networks and other resources. The SRWCP is jointly led by WWF-Canada and Coast Tsimshian Resources with federal funding support through Natural Resources Canada and a matching contribution from the Coca-Cola Foundation Cortex Consultants Ltd is developing the modeling component of this project under the direction of WWF and CTR.

CTR is the Principal Investigator for the FFESC funded 'Climate Change Adaptation Planning for NW Skeena Communities Project.' This project works in partnership with a range of expert advisors, academics, consultants, and government advisors and researchers including: UBC Department of Sociology, UBC Department of Forestry, University of Lausanne, Environment Canada, ESSA Technologies LTD, BC Ministry of Environment, the BC Ministry of Forests and Range, and Brinkman & Associates Reforestation Ltd. Partners from both projects are working together share information and findings, and to strengthen the research process.

Your input and inquiries are always welcome!

To learn more about the Climate Change Adaptation Planning for NW Skeena Communities project, please email Katie McPherson at:

katie_mcpherson@brinkman.ca

For more information about the Skeena River Water Conservation Project, you can email James Casey at:

JCasey@WWFCanada.org

Information about both projects and contact details for members of our research team can be found by visiting our website:

http://brinkmanforest.com/ffesc

For more information on the Future Forest Ecosystem Scientific Council and other research projects, please see the FFESC website:

http://www.for.gov.bc.ca/hts/