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WISCONSIN INITIATIVE ON CLIMATE CHANGE IMPACTS

WICCI Science Council Meeting

Monday, January 11, 2010
DNR Science Operations Center
12:00 PM

ATTENDANCE

Members

- Richard Lathrop (Co-Chair)
- John Magnuson (Co-Chair)
- Erin Crain
- Sharon Dunwoody
- Bud Harris
- Barry Johnson
- George Kraft [via Live Meeting)
- Chris Kucharik
- John Kutzbach
- James LaGro
- Pat Leavenworth
- David S. Liebl [via Live Meeting]
- Kristen Malecki
- Sandra McLellan
- Philip Moy
- Pete Nowak
- Jonathan Patz
- Kenneth Potter
- Jack Sullivan
- Dan Vimont
- William Walker
- Darrell Zastrow

Staff and Guests

- Tim Asplund
- Alison Coulson
- Avery Dorland
- James Hurley
- David Webb
- Steve Pomplun

ABSENT MEMBERS

- Lewis Gilbert

MINUTES

[12:00] Meeting called to order by Dick Lathrop.

Members and guests introduced themselves.

Announcements and Approval of Meeting Minutes

Bud Harris – Green Bay working group has been working with the ecological aspects of the Bay, but are looking to involve the community through a series of workshops. This seminar is sponsored by UW-GB, GBMSD, UW Sea Grant, and WICCI (hopefully). This is

an outreach effort they propose to run for a year, and would like to do one a month. They have a line up of speakers proposed, many of whom are on the Science Council.

Avery Dorland announced there are some upcoming meetings related to forestry and climate change:
Feb 17-18 WICCI Forestry Working Group Assessment Workshop - Madison
Feb 24-25 USFS Shared Landscapes Initiative Workshop - Rhinelander
April 27-29 - USFS Science Needs Workshop - Milwaukee

The DNR will be hiring a science writer in next couple of weeks to help with the assessment report.

[12:11 pm] Minutes from December 7, 2009 meeting approved

Review of Action Items

Everyone had followed through with the action items from the December meeting, except Dan Vimont (he will send out a copy of Columbia University's publication that reviews how to communicate climate change effectively soon).

Update on Agriculture Working Group

Pete Nowak and Chris Kucharik held a meeting on December 16 at CALS (Participants included representatives from Horticulture, Plant Pathology, Dairy Science, Soil Science, SAGE). Kucharik presented the past and future climate data to the group. They discussed research issues associated with the climate trends and projections. They also discussed the working group and asked for volunteers to be a part of the Agriculture working group. Five people said they would like to participate. The next step will be to approach DATCP for participation.

Pete Nowak says they need to get the core group set up before reaching out to other campuses.

Dick Lathrop reminded everyone that the April 1 deadline is coming fast, and wants to know how the Science Council can help move things along to get an initial assessment together for this first report.

Chris Kucharik says there is enough known now on the topic, and that we could move forward and get input from those who are already involved and have enough for the report.

Pat Leavenworth says NRCS will be doing an analysis of soil carbon content that will set the baseline. From a technical standpoint, things are moving along on this issue. But from the perspective of engaging farmers, there is not much going on. However, the Conservation Security Program is one thing that is underway and engaging farmers.

Dan Vimont raised the question of what the overall scope is for this group. Does it involve adaptation strategies to physical climate change, and/or adaptation strategies to the political and policy decisions related to climate change?

Dick Lathrop asked if we should schedule a workshop to help get the input from other groups.

Chris Kucharik and Pete Nowak said the Science Council should not be concerned as there will be enough information and time for the Ag Working Group to put together their assessment report by the April 1 deadline. Their target audience for the first report will not be individual farmers.

Bill Walker says that the agricultural community is still talking about very basic things when it comes to climate change adaptation, so the overview information from this group will be very helpful.

Presentation from Forestry Working Group (Avery Dorland)

- Updates on Resources
    1) New part time support from DNR Forestry
    2) Science Services time allocated
    3) Post Doc (soon to come)
- Crossover Members
    1) Karin Fassnacht (Wildlife)
    2) Linda Parker (USFS)
    3) Jack Williams (Plants & Natural Communities)
        1. There will be a tool to look at several variables with new downscaled data (from Jack Williams and Sam Veloz)
- USFS Partnership, USFS will cover the northern half of the state, and the rest of the WICCI group will focus on the southern part of the state. Assessment will include forest type and species analysis using the WICCI downscaled data.
- Will use USFS work, UW species models, and the analogs (Jack Williams) for potential forest implications. They will do an ecological assessment for now, economics later.
- Looking for help on the Feb 17-18 WICCI Forestry meeting. Help from Science Council to encourage participation on the expert panel. Will also seek help from the Nelson Institute on organization and promotion of the event.

Questions/Comments:

- Dan Vimont: if analogs are based on variables that are not relevant to forestry, what are the implications? They will rely more on the Forest Service data, and use Williams' analog data to fill in gaps.
- John Magnuson: Are you thinking of doing it on seasonally and quarterly as well as annual? Response - Yes they are doing it seasonally.
- Jonathan Patz: What about carbon sequestration issue in WI forests? Not within the scope of WICCI for this report (focusing on ecological)

- Pete Nowak: The DNR and Forest Service do not control all of the land, so what are your plans for individual land owners? Response – The working group is not there yet with WICCI, although the Forest Service is working on that outreach piece.
- Darrell Zastrow: Directors from MI and MN and the Wisconsin DNR Secretary have talked about sharing information. But for this coming meeting, we are not at the point where we want to go too far in inviting outside states.
- John Magnuson: How do you plan their mechanics of the writing? Response - We have an outline for the report and will use free site hosting through Google to help assemble documents and pieces of the report.
- Tim Asplund: Would like to know how they are handling the expert panels and getting information from them. It would be nice to put a framework over the process to help them work through model analysis and assumption analysis.
- James LaGro: Is there a plan to include urban forestry? Response - Yes, we will use it as a landscape category.

Presentation from Human Health Working Group (Jonathan Patz)

- At this point, the work of the group is solely based on their CDC grant: "Developing a state-level health impact assessment of climate change in Wisconsin" (WI Dept of Heath Services, UW-Madison, UW-Milwaukee, Medical College of WI, Marshfield Clinic)
- Focused on rainfall/runoff and waterborne diseases:
    1) State-wide surveillance and vulnerability
    2) Milwaukee area (especially viruses in surface waters) and stream gauge analysis – has most overlap with other WICCI groups
    3) Marshfield area (all pathogens, including snowmelt and rainfall time-series)
    4) Risk functions applied to downscaled climate scenarios for WI
- Data shows that Combined Sewer Overflows (CSOs) occur at about a 1.9 inch precipitation event, and there will be more viruses and *E. coli* present as well.
- Kristen Malecki's group at the Health Deptartment is looking over different databases to create a link to the climate data
- They are doing a case study approach in Milwaukee, however they are looking at a database that tracks on chief complaint at hospital/clinics (but there are other ways to track human health – pharmaceutical sales, etc.)
- They are beginning to look at school surveillance and absentee databases
- Steve Corsi/Peter Hughes from USGS are looking at viruses in drinking water. The aging infrastructure of pipes and septic systems is an important factor and 30% losses from collection systems. It does not take many viruses to get people sick, very low levels make a huge difference. They are looking at the waterborne viruses in Milwaukee area surface waters and how this relates to hydrology. They are sampling for five types of viruses at automated stations are testing for other variables besides viruses. The viral sampling is documenting runoff events, and timing (cold-weather months), and points to failing wastewater infrastructure in some streams.
- Also a study in Marshfield is looking at everything (not just viruses). Rainfall, runoff and snowmelt and human cases of disease.

Questions/comments:

- What would be the next health issues they should tackle? Heat waves? Co-benefits from urban planning? The working group should address this in the report.
- John Kutzbach: The report would benefit from the Human Health group brainstorming on the types of things they could be looking at. Kristen Malecki said that precipitation events have the greatest effect on human health and our population.
- Sharon Dunwoody urged the group to frame the issue by saying there are several risks to human health, but that the water component is one of the risks.

Presentation from Milwaukee Working Group (Sandra McLellan)

- The group is looking at the climate variables that will impact Milwaukee such as more extreme weather (hot days/nights, air quality, extreme precipitation events) but will also look at how the built environment could be enhanced to help adapt.
- They ranked the sensitivities in the Milwaukee area.
- From that list, they developed three broad areas:
    1) Water Infrastructure
    2) Public Health
    3) The Build Environment
- CSOs in the Great Lakes (what are the points of exposure? Drinking water intakes, etc.)
- Study is funded by the Milwaukee Metropolitan Sewerage District, to look at the Climate Change Impacts of CSO and Sanitary Sewer Overflow (SSO) in the Milwaukee Watershed will hopefully be done by April.
    1) Determine SSO and CSO frequencies under projected climate conditions from mid 21st century using MACRO (this will answer how many more CSO/SSO events).
    2) Utilize remapped climate data in the Mike Urban model to project SCO/SSO to determine the effect on water quality (this will be used in watershed modeling to look at the impact of these events on water quality).
    3) Evaluate driving forces related to climate parameters. The rainfall threshold fro SSOs and CSOs will be evaluated for spring and non-spring months under current and projected climate conditions (this will identify benchmark parameters).
- Description of working group in report: focus on Milwaukee as an urban area but also strongly linked to Lake Michigan (population center and coastal environment)
- Vulnerabilities: Water infrastructure, Public Health, the Built Environment
- Sensitivity Analysis will be used on the study they are doing, but they will address other areas that need more attention (flooding, air quality, near shore circulation, built environment)
- Adaptation: not ready to make recommendations in first assessment report.

Questions/Comments:

- Dan Vimont: The good thing about taking the approach of identifying needs is that it will help in seeking future funding.
- Pete Nowak: Human behavior will have to be taken into account, for example heat waves and public behavior (people often flock to water during periods of high heat)

- The data will be disaggregated, but the Milwaukee Group will work with the Stormwater WG to discuss the disaggregating the data.
- If still looking for help on the built environment, the Milwaukee WG may want to talk with Jim LaGro.
- Jack Sullivan: It is okay to lay out the uncertainties, because over time we will be able to undertake the research to answer those questions. Working groups should speculate on where the vulnerabilities might lie, and where interactions might occur in, even if they do not have the answers on them.
- Dan Vimont: Did we ever decide if we were going to adapt definitions of 'uncertainty' etc.? John Magnuson says that we are not going to get there at the level of the detail of the IPCC's classification. Dan Vimont suggests that the writer might want to work these issues out so that there is consistency among the groups.
- Sharon Dunwoody: The report will go out to people who interpret uncertainty different than we do, so it will be important to lay out what we mean by uncertainty in our text, to help readers interpret our reports.
- Bill Walker: If this report will go to a public decision-making audience, and it will be a great service to them to talk about the uncertainties.

[2:05] Break

Presentation from Water Resources Working Group (Tim Asplund and James Hurley)

- The group met this summer to identify the scope and research needs. UW Water Resources Institute held a call for proposals for climate-related water resources proposals. Announcements should be made in February.
- There is a new Focus on Energy research project (DNR Science Services) assessing long term hydrologic impacts of climate change across WI. This modeling would be a part of the second assessment report.
- The group put together a strategy document outlining what they will accomplish to meet the April 1 deadline.
- Divided impacts into three categories
    1) Extreme Events
    2) Water Availability
    3) Thermal Impacts
- Also grouped themselves into several resource groups to identify impacts based on the three above categories. These groups were:
    1) Lakes
    2) Wetlands
    3) Rivers/Streams
    4) Hydrologic Processes
    5) Groundwater
- At their next meeting they will revisit impacts and begin to conduct vulnerability assessments based on resource groups to begin to identify the high priority issues.
- Not sure how far they will get with Adaptation Strategies. There will need to be watershed scale modeling and planning to produce meaningful adaptation strategies.

- For the first report, the focus will likely be on possible impacts to hydrologic processes, while providing specific case studies or examples of impacts to certain lakes, wetlands, and streams where available.
- The Water Resources working group will be presenting at the Wisconsin Wetlands Association (WWA) meeting in Eau Claire on Feb 11-12, and the WI Section of the American Water Resources Association (AWRA) meeting on March 5th to help get feedback and flesh out ideas.
- Because of the integral role of water for other working groups, the WR group invites other working groups to attend their meetings and hopes to attend meetings of other working groups in the future to ensure that we know what each group is covering and not covering.

Questions/Comments:

- John Magnuson: worried that the USGS peer reviewed process would hold things up. Hurley is hoping to get the fact sheets on the USGS research released sooner to help with the early use of the information.
- Jonathan Patz: will the Working Group be addressing water temperature impacts on blue green algae blooms? Asplund – yes.
- Barry Johnson: will you look at the sources of base flow (sewage effluent vs. groundwater). Do you anticipate analyzing the inputs into the Mississippi River? Yes, but this would be in future assessment reports.
- John Magnuson: We need to think about how we can use information about what we are finding out without being stymied by the scientific peer review processes.

Presentation from Stormwater Working Group (Ken Potter and David Liebl)

- This group will focus on adaptation strategies because they feel that there are things that can be done today.
- Current Modes of Managing High-Water Conditions
    1) Large-scale flooding (infrastructure and regulating exposure to flood risk)
    2) Stormwater management (smaller scale, mostly conveyance systems)
    3) Stream bank erosion
    4) Ag soil erosion
    5) Wastewater treatment
    6) Stream crossings (bridges and culverts)
- Potential Changes in Wisconsin Climate, show predicted increases in the amount of winter-spring precipitation and in the ratio of rain to snow
- Looked at 100-year flood for Madison, not much difference by the end of the century.
- More precipitation in the spring (will be rain)
- Does not think we have enough information to say that the extreme precipitation events that we have seen in Madison during the summer are related to anthropogenic climate change.
- Stormwater: dealing with small areas, a lot of which is impervious, so the impacts depend on magnitude and frequency of large individual events in the summer.
- Stream and river flooding: impacts depend on both large events as well as the amount of rain in the preceding period. Spring precipitation might be a significant factor.

- Lake flooding: spring precipitation will be important contributor.
- Ground water flooding: water moves very slowly, so flooding events depend on water over months and even years.
- Will identify adaptation strategies for:
    1) Local Level
    2) Education
    3) Research
- Adaptation Tactics
    1) Planning (community level)
    2) Design (professional water managers)
    3) Management
- Adaptation Opportunities
    1) Create new/restore flood storage wetlands, eliminate chemical storage on floodplains, etc.
- Future Working Group Activities
    1) Separate climate-induced and land-use-induced impacts
    2) Improve modeling capability
    3) Evaluate the economic consequences of failure of infrastructure
- Many of the recommendations are things that people in the industry know we should be doing, but we are not doing because of lack of political will. Getting those recommendations out in a report will help get things moving.

Questions/Comments:

- Bill Walker: It will be important for each group to write as much as they can so the science writer will have enough information to work with.
- Jonathan Patz: The conclusions of each sector chapter will not be surprising or earth-shattering. The adaptation cross-cutting chapter could be very informative and helpful to prioritize and integrate solutions. Bill Walker: they have that in mind, but they will probably find recommendations that conflict with one another.
- Jack Sullivan: We may want to think about an expert panel that sits down and talks about adaptation strategies and integration, highlighting what the State should pay most attention to. This may be one of the functions of the Science Council and/or the Adaptation Working Group.

New Climate Data Update from Dan Vimont

- Focus on Energy will continue to fund the Climate WG to analyze and develop scenarios for wind, evaporation, and solar. Wind and evaporation will be okay. He has less confidence in solar radiation since there has not been much data recorded on that.
- They have completed the models for snow and potential evapotransiration already.
- The Climate WG has been moving very fast and has been getting ideas from many people. Dan Vimont would like to formally apologize if they have stepped on anyone's toes. If there are any issues that come up, please talk to Dan.
- As they begin to write papers, they will be looking for co-authors/collaborators, which will only strengthen WICCI.

- The climate projections: using both historical trends and model projections, they have used the models to see if the past trends are predicted to continue into the future. Tmax, Tmin, and precipitation are consistent in the models and the historical trends. In the winter time precipitation, the models agree with the sign of the change in the winter. For summer and even spring and fall, there is little consistency between the trends and the models.

Discussion of Extreme Event Projections

- Ken Potter posited that we cannot attribute the extreme rainstorm events we have seen in recent years to GHG-caused climate change.
- Chris Kucharik agreed.
- Some of the problem could be terminology issues (e.g. is an extreme precipitation event defined as 3+ inches or 6+ inches)
- Ken Potter: It will be hard to help a decision maker or planner to make decisions based on the spread of the climate models in relation to rainfall. We have to do the economic analysis to make these adaptations. We are short on cost-benefit analyses, which will really help decision makers.
- Dan Vimont: The issue here is the model spread, and the spread is not a realistic illustration of what will happen. They can say how large events will change during the winter and possibly spring, but there is a lot of uncertainty in summer large precipitation events.
- Dan Vimont agreed with Chris and Ken's assessment on past changes. For future changes, Dan Vimont also agreed with Ken's assessment that there is more uncertainty surrounding future projections of large precipitation events during summer than surrounding changes during winter, spring or fall.

Agenda Items for February 1 Meeting

- Discussion of Uncertainty in the Assessment Report
- Peer Review issues: What we can and cannot say in the upcoming report
- Outreach Committee Update
- Other scheduled Working Group reports

[3:56] Meeting Adjourned

APPENDIX

Science Council Meeting Agenda – January 11, 2010

12:00	1 –	Welcome and Introductions
12:05	2 –	Announcements and Approval of Minutes from the December 7 Science Council meeting
12:10	3 –	Progress on Action Items from the December 7 meeting • **Pete Nowak, Lewis Gilbert,** and **Ken Potter** will be part of a subgroup to give feedback on the Central Sands WG white paper, and give guidance on transforming it into an assessment report. • **Kevin Gibbons** and **Alison Coulson** will create a place on the website to post white papers. • **Alison Coulson** will send the updated outline of the assessment report to Science Council members and Working Group chairs. • **Dan Vimont** will send out a copy of Columbia University's publication that reviews how to communicate climate change effectively.
12:15	4 –	Agriculture WG Update (Pete Nowak)
12:20	5 –	Forestry WG Presentation (Avery Dorland)
12:50	6 –	Human Health WG Presentation (Jonathan Patz, Kristen Malecki)
1:20	7 –	Milwaukee WG Presentation (Sandra McLellan)
1:50	8 –	Break
2:00	9 –	Water Resources WG Presentation (Tim Asplund, Jim Hurley)
2:30	10 –	Stormwater WG Presentation (David Liebl, Ken Potter)
3:00	11 –	Discussion of Issues Raised about Extreme Precipitation Events
3:30	12 –	Request for Agenda Items for February 1 Meeting
3:35	13 –	Adjourn