

PERMAFROST CHANGE

ISSUES

- Tuk: sea ice loss, foundation shifts, ponding
- Sachs: foundation shifts
- Aklavik: lack of knowledge & expertise
- Paulatuk: coast erosion, sea ice, dry lakes, ponding
- Ulukaktok: foundation houses, sewage lagoon
- Inuvik: lack of construction standards
- Gemeti: erosion, winter roads, water supply
- Behchoko: cemetery, solid waste site
- JMR: can't fill water reservoir
- Ft. Res: ponding, road flooding & failure

PERMAFROST CHANGE

...ISSUES

- Importance of monitoring
- Lack of capacity & training
- CC adaptation issues can be “overwhelming”



PERMAFROST CHANGE

ACTIONS

- More funding & training to build capacity
- Geotechnical specialists work with community
- NWTAC should review existing zoning bylaws
- More attention to water & drainage management
- Assistance in reinforcing roads
- Revise road standards in light of CC impacts
- Remediation &/or relocation of solid waste sites
- Look at CC with both municipal & cultural lenses
- “Marry” comm. observations with technical data
- Cultivate comm-govt-sci-engineer dialogue & co-op

PERMAFROST CHANGE

...ACTIONS

- Community-level monitoring
- Build knowledge & expertise to choose priorities
- Develop community-specific profiles of CC issues
- Develop web “portal” of resources, experts, info.

TRANSPORTATION

ISSUES

- Vulnerability of winter roads
- Changes in drainage (*on* roads & *by* roads)
- Over-reliance on limited transportation options
- CC impacts on airport operations
- CC issues around re-supply via barge & sea-lift

ACTIONS

- Community granular plan (for thaw-stable materials)
- Community drainage plan
- Vulnerability assessment

TRANSPORTATION

...ACTIONS

- Regular infrastructure inventory & assessment
- Get input from communities (eg. ice road routing)
- Assess CC impacts on airport operations

EMERGENCY MANAGEMENT

ISSUES

- CC needs to be *central* to normal risk planning
- EM functions - prevention, mitigation, preparedness, response, recovery - not well integrated
- Hard to plan for unknown risks!
- Fuel tank stability, replacement, spill prevention
- Landfill site stability
- More firebreaks with new fire regime?

EMERGENCY MANAGEMENT

ACTIONS

- Plan for *long term* issues (10 years)
- Make EM planning bottom-up not top-down
- Good inventory (facilities, services) & contact list
- Regular review of EM policies & procedures with CC
- Establish Emergency Plans in every community
- Enhanced EM training in communities

ENERGY EFFICIENCY (Buildings)

ISSUES


- How to encourage residents, tenants to do it?
- How to increase EE awareness?
- How to overcome technol. & regulatory barriers?
- Some communities can't even get EE *appliances!*
- Need for more extensive inspection services
- How to overcome up front costs for EE technol.?

ACTIONS

- Enhance partnerships bet. Commun & EE agencies
- Wider use of simple & cheap EE measures

ENERGY EFFICIENCY (Buildings)

...ACTIONS

- **Implement locally relevant EE bylaws & standards**
 - **Track building energy use & create targets**
 - **Pool energy tracking info among communities**
 - **Better training & education**
 - **Take full advantage of existing EE funding**
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ENERGY PLANNING

ISSUES

- Good energy planning lower \$\$ & greenhouse gases
- Regulatory barriers to renewable energy (NTPC)
- Complexity +/- or perception (eg. Con geothermal)
- Success stories need to be shared more widely
- Costly up-front costs of renewable energy tech
- Lack of community capacity
- Too much time spent on planning!

ENERGY PLANNING

ACTIONS

- Plain language information on renewable energy
- Create community energy profile
- Communities should request energy policy changes
- Enhance GNWT & federal energy funding
- Learn from other jurisdictions
- Promote community awareness & buy-in
- Negotiate for community-owned utilities

WATER & WASTEWATER

ISSUES

- Costs & impacts of CC on water are hidden
- What ecosystem indicators to monitor?
- Funding for infrastructure maintenance & upgrade?
- How are oil sands water impacts linked to CC?
- More turbidity may stress water treatment plants
- Increased leaching of hazardous wastes from CC
- No assessment of water quality trends by MACA
- Water could be one of highest risks with CC!
- Present infrastructure designed with *past* climate

WATER & WASTEWATER

...ACTIONS

- **Implement Water Stewardship Strategy!**
- **Regular (3 year) assessment of water infrastructure & drainage**
- **Community-set standards for water quality**
- **Translate these standards into bylaws & guidelines**
- **Develop water protection plan**
- **Identify water monitoring priorities**
- **Focus on prevention rather than reaction**
- **Incorporate potential CC impacts into water planning**
- **Independent water testing**
- **Share success stories (eg. containment of Inuvik dump site)**


INFRASTRUCTURE STANDARDS

ISSUES

- Need to reflect snow & ppte changes
- Gaps in building codes
- Lack of inspection capacity
- Lack of enforcement capacity
- Voluntary compliance doesn't work if no standards
- No CSA guidelines for *existing* structures
- CC not reflected in risk management & insurance
- Short-cuts taken without building inspections

INFRASTRUCTURE STANDARDS

...ISSUES

- Lack of data - *and* the capacity to collect it
 - Limited access to inspectors
 - Water delivery spillage worsens permafrost decay
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INFRASTRUCTURE STANDARDS

ACTIONS

- CSA Permafrost Guide for *existing* structures
- Insurance reflects northern standards/guidelines
- Community govt's include CC inspection practices
- Develop standards for alternative energy technology
- Enhance inspection capacity & followup spot checks
- Plain language education tools on p.frost protection
- Develop checklists & guidelines aimed at community
- Better funding for climate data collection & interp
- Share success stories (eg. Inuvik's iglu church)

ADAPTATION PLANNING

ISSUES

- Different perceptions, priorities in assessing risks
- People not convinced adaptation important
- Lack of community capacity
- Lack of continuity in federal funding
- Lack of basic information and education tools
- Big communities slow to adapt (not feeling impacts)
- Too many plans! Need to be integrated

ACTIONS

- Identify priority risks & actions
- Don't wait - act now!

ADAPTATION PLANNING

...ACTIONS

- Monitor change, know what is happening
- Wider use of Centre for Indigenous Environmental Resources (CIER) CC planning tools
- Draw on local knowledge, experience, skills
- \$ never secure; focus on community self-reliance
- Identify ways to generate enthusiasm & interest
- Integrate adaptation into land use plans
- Use NGO's (AEA, EN, Pembina, CIER, etc.)
- Share knowledge (elders-youth, between commun.)
- Go back to harmonious relationship with the land