Environmental forcing of the circumpolar coastal zone: current status and required directions

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Forcing of the coastal zone

EF in this context: what can alter the form of the coastal zone?

WIND

- waves
- surges
- surges + waves

Temperature

Sea ice movement and formation/destruction

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Effects

High wave energy + positive surge

Cliff notching and slope slump failure

Thermal stress on ice bodies

Block failure

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Impacts

S. Solomon, Cdn Beaufort

G. Manson, Cdn Beaufort

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Environmental forcing work in the ACD

- Most dynamical work performed during extreme events
- Develop storm climatology and trend assessment (observational)

Also

- NCEP/NCAR Reanalysis for more spatially detailed
  - storm climatology
  - other parameters, eg MDD
Some results

ACD zones, weather station locations

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Storm counts

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and storminess trends

Storm counts by sector

1966 1970 1974

mean # events/OW season

BN Kar Lap ESS Chu Beau CAA

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Storm counts by sector

mean # events/OW season

BN
Kar
Lap
ESS
Chu
Beau

1975

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Next steps and needs

Near term

➤ feed into ACD network
➤ NNR data – uniform climatologies

Farther term

➤ higher resolution EF required

because

> coast form highly variable spatially
> resultant EF effects also spatially variable
> data about form, makeup of coasts being assembled (ACD)
Next steps and needs
Bringing together modelling efforts and the env. forcing

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Combined with detailed knowledge of material type/composition, e.g. ACD members
Thank you
How?

> Within GIS being developed in ACD
  - information retrieval
> Combine models
  - fully explore dynamical aspects

Thank you