

North Saskatchewan River Basin Council Culvert Modelling Applications

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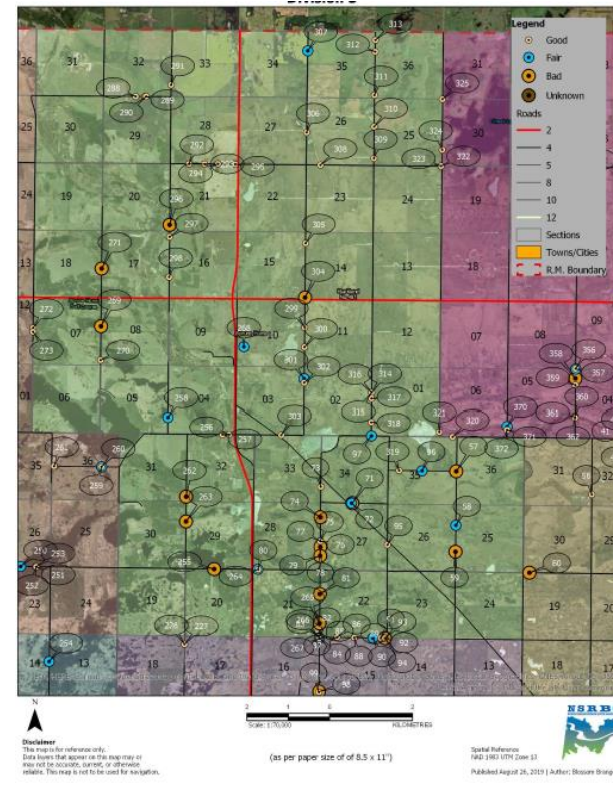
Active Water Management

- ▶ Proactive land management mitigate problems
 - ▶ Erosion
 - ▶ Flooding
 - ▶ Wells
 - ▶ Infrastructure
 - ▶ road access
 - ▶ Housing
 - ▶ Impacts to water quality
 - ▶ Source water
 - ▶ Recreational
 - ▶ Livestock



Culvert Mapping

- Survey community culvert infrastructure
- Report on stats and condition



Culverts: Bigger is Better..... Right?



- ▶ 2013 RM of Leask upscaled their culverts.
- ▶ Downstream the community of Mistawasis Nêhiyawak experience flooding,
 - ▶ Impacting roads and housing
 - ▶ Emergency diversion was required
 - ▶ Closed basin lakes filled
 - ▶ Long term shoreline impacts
- ▶ Mistawasis Nêhiyawak interested to divert water
- ▶ Withheld, over concerns of impacting their downstream neighbours (municipalities)
- ▶ Modelling to predict holdback flow and impacts over long term cycle
- ▶ Assess risk and scope of impact.

Research Engagement: Foster links between research and community needs

- ▶ Host UofS Master's Research studies
- ▶ Our 2020 Students and Research



Kelvin Altraide



Culvert Assessment and
Flood Modelling in Rural
Saskatchewan

Kelvin Altraide, MWS candidate

A Project Submitted to the College of
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the Degree of Master of Water Security in
the School of Environment and
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Project Advisor: Dr. Andrew Ireson
Project Co-advisors: Dr. K. Shook & Dr. L. Bradford
Partner Organization: NSRBC
Project Coordinator: Dr. Andrew Ireson

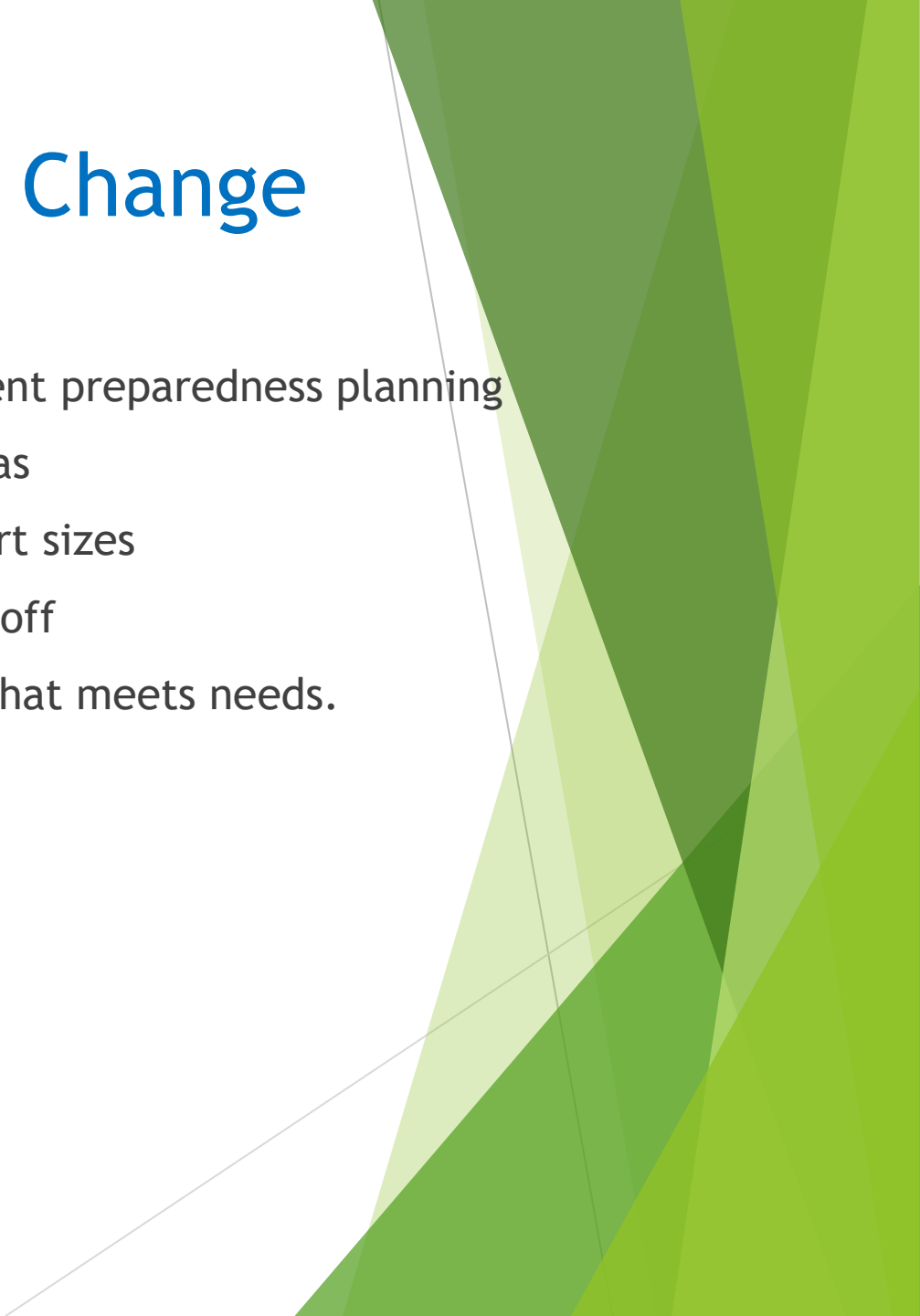
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Anita Bhatt



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- An abstract graphic featuring a white background on the left and a series of overlapping, translucent green and blue geometric shapes on the right. A thin, light gray diagonal line runs from the bottom left towards the top right, passing through the green shapes. The word 'Change' is written in a large, blue, sans-serif font in the upper left area. Below it, the text 'ent preparedness planning', 'as', 'rt sizes', 'off', and 'hat meets needs.' is displayed in a smaller, dark gray, sans-serif font, arranged in a list-like structure.
- # Change
- ent preparedness planning
- as
- rt sizes
- off
- hat meets needs.

WSA Agriculture Water Management Strategy

- ▶ Agriculture Water Management strategy:

- ▶ Approved drainage networks are required to mitigate runoff impacts by managing flow.
- ▶ Flow controls can be undersized culverts, gates, reservoirs etc.
- ▶ Tech gains to be made to maximize benefits of control measures



- ▶ Maximizing retention during runoff could:

- ▶ Increase deposition
- ▶ Reduce nutrient inputs downstream
- ▶ Predict hold back inputs in extreme moisture events

Limiting Factors

- ▶ Governance uptake
- ▶ Input requirements
 - ▶ Survey culvert and site data
 - ▶ HQ DEM (LiDAR)
 - ▶ Navigate CRHM and PCSWMM
 - ▶ 30hr run times
- ▶ GIGO - Magnifying lens for local management.

