



FLOOD MITIGATION PANEL DISCUSSION FEBRUARY 20, 2014

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1. FLOOD HAZARD MAPPING

- Refine or Rethink?

2. FLOOD MITIGATION WORKS

- Keys to making it happen

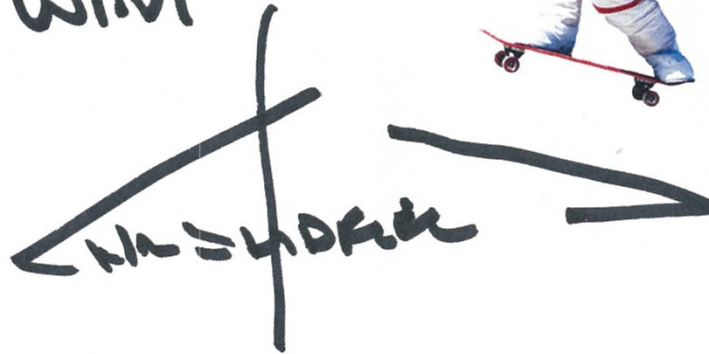
CHRIS HADFIELD

AN ASTRONAUT'S GUIDE
TO LIFE ON EARTH



TO

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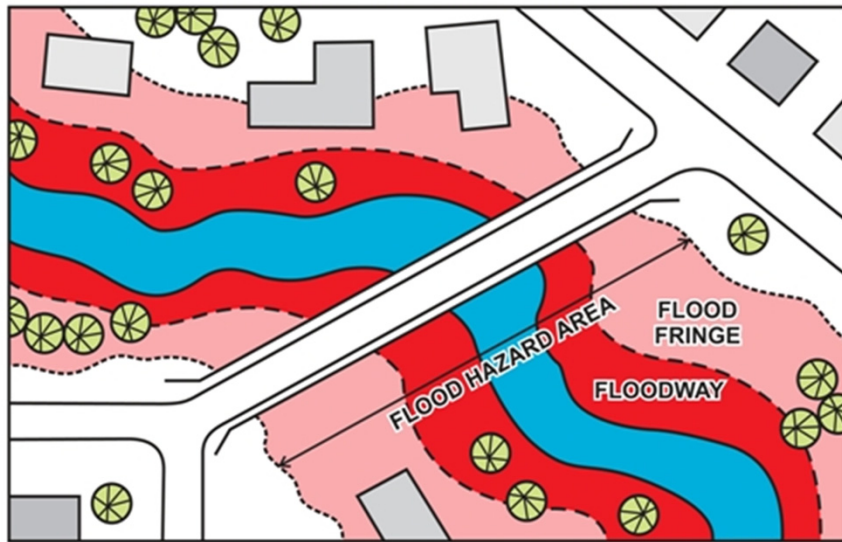
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TO LIFE ON RIVERBANKS

FLOOD HAZARD MAPPING

1. Current Methodology
2. What Worked Well in 2013
3. What Didn't Work Well in 2013
4. Refine or Rethink?

CURRENT MAPPING METHODOLOGY



1. SOUND BASIC METHODOLOGY
2. DETAILS OPEN FOR REVIEW AND DEBATE
 - flood criteria?
 - mapping criteria?

WHAT WORKED WELL IN 2013

1. NEW DEVELOPMENTS

- East Village
 - Elevation
 - Bank restoration
- Quarry Park
 - Elevation
 - Riprap installed in potential bank erosion areas



2. OLDER DEVELOPMENTS

- Inglewood

WHAT DIDN'T WORK WELL IN 2013

1. HIGH RIVER

- Size of flood – much greater than 1:100 year
- Complex flow characteristics
- Sediment buildup
- Questionable Developments?



BANK EROSION

1. COUGAR CREEK

- Sediment transport and Deposition
- Buffer/Setback the problem
- Alluvial fans are unique

2. BOW RIVER

- Sediment Transport = Flow
Curvature = Bank Erosion
Greater than Expected



REFINE OR RETHINK MAPPING?

1. ALBERTA'S BASIC 2 ZONE METHOD IS SOUND AND PROVEN.

- appropriate modelling technique (1D or 2D) depends on river characteristics
- modelling details should be reviewed



2. TIME TO:

- adapt a minimum 1:200 year criteria
- think much more about “what ifs” in setting freeboard/safety factor – our calculations in mobile rivers are not that precise

FLOOD MITIGATION WORKS

1. DESIGN FLOOD
2. BALANCED APPROACH – EQUALITY OF PROTECTION?
3. ECONOMIC ANALYSIS – STRENGTHS? WEAKNESSES?
4. ENVIRONMENTAL IMPACTS – IMPORTANCE? HOW ADDRESSED?
5. GOVERNMENTAL DIRECTION

FLOOD DESIGN CRITERIA

1. WHAT DO WE DESIGN FOR? 2013 FLOOD WAS:
 - Highwood River – much greater than 1:100 year flood
 - Elbow River u/s Glenmore Reservoir = 1:500 year flood
 - Elbow River d/s Glenmore Reservoir = 1:100 year flood
 - Bow River u/s Elbow River = less than 1:100 year flood
 - Bow River d/s Elbow River = 1:100 year flood
 - Bow River d/s of Highwood River = greater than 1:100 year flood
2. Uniform criteria or 2013 flood or “biggest bang for your buck?”

FLOOD DESIGN CRITERIA – OTHER EXAMPLES

1. ORIGINAL WINNIPEG FLOODWAY = 1950 RED RIVER FLOOD
2. RECENT FLOODWAY EXPANSION = 1997 FLOOD, GREATER THAN 500 YEARS
3. NETHERLAND'S DELTA WORKS = 1953 NORTH SEA'S HISTORIC RECORD STORM
4. ONTARIO – HURRICANE HAZEL

PUBLIC CAN UNDERSTAND AND ACCEPT – “YOU WILL BE PROTECTED FOR THE 2013 FLOOD.” FREQUENCIES MORE DIFFICULT TO UNDERSTAND

EQUALITY OF PROTECTION? MANITOBA EXAMPLE

1. **Winnipeg** – now protected for 1997 flood (> 1:500 year flood).
2. **Towns u/s Winnipeg** – dyked for 1950 flood – after much debate
3. **Lake Manitoba** – additional man-made flooding of cottages during the 2011 flood
4. **Farms u/s of Winnipeg** – homes dyked, land not protected (could have benefited from floodway at a cost)
5. **Farmland along Assiniboine R, in 2011** – dykes breached to lessen flood concerns in Winnipeg

*THE PUBLIC IN MANITOBA ARE VERY KNOWLEDGEABLE RE: FLOODS.
TRANSPARENCY IS KEY. BUT NOT ALL PARTIES ARE SATISFIED*

A UNIFORM OR MINIMUM ALBERTA-WIDE FLOOD CRITERIA NECESSARY? DESIRABLE?

1. OTHER AREAS IN THE PROVINCE:

- Red Deer River – Sundre, Red Deer, Drumheller
- Oldman River – Lethbridge
- S. Saskatchewan River – Medicine Hat

*ESTABLISH PROVINCE-WIDE MINIMUM CRITERIA/APPROACH. BE
TRANSPARENT – STATE WHAT YOU CAN AND CANNOT
PROTECT FOR*

ECONOMICS

1. BENEFIT/COST ANALYSIS RE:

- Go/No Go – Winnipeg Floodway Example

2. VALUABLE FOR COMPARING OPTIONS

- Elbow R. Tunnel vs. “Dry” storage u/s?
- Size of Tunnel?
- Size of Dry Storage u/s?
- High River Floodway vs. “Dry” Storage u/s?
- Size of High River Floodway?

ENVIRONMENTAL

1. GOVERNMENT COMMITMENT, AFTER ECONOMIC ANALYSIS, IS ESSENTIAL
2. THEN:
 - Locate/design/construct/compensate
 - Operate to minimize environmental impact

-DO NOT LET THEM DERAILED NEEDED PROJECTS

*THERE WILL BE NUMEROUS OBJECTIONS
- DEAL WITH THEM*



GOVERNMENT COMMITMENT

1. OTHER JURISDICTIONS

- Winnipeg Floodway – “Duffs” Ditch – A Province Building Project
- Netherland’s Delta Works and Polders – Nation Building Projects

2. ALBERTA’S COMMITMENT TO MAJOR PROJECTS

- Dickson Dam – Red Deer River – Water Supply for Industry
- Oldman River Dam – Irrigation
- Rehab of Alberta’s Irrigation Projects - Irrigation
- Lougheed and Fish Creek Provincial Parks - Environment
- Calgary and Edmonton Ring Roads – Transportation

3. TIME FOR MAJOR COMMITMENT TO FLOOD CONTROL PROJECTS

THANK YOU

