Flood Maps: the first step

From Maps to Resilience

Setting the stage:

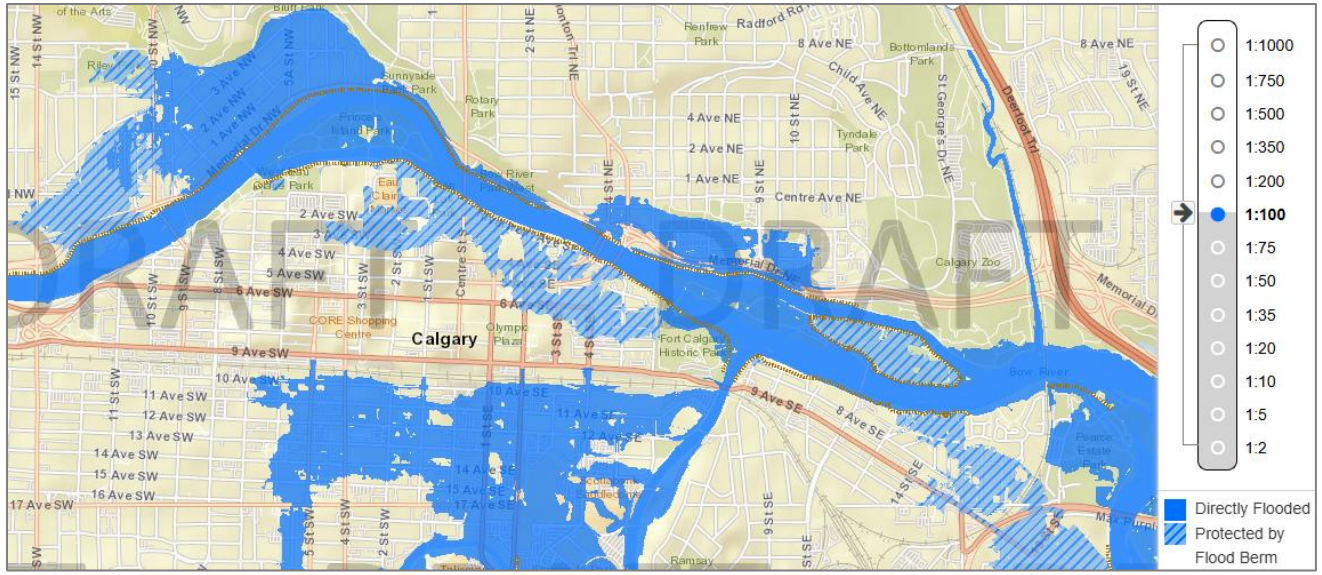
CALGARY HAS HAD FLOOD MAPS AND REGULATIONS SINCE 1983.

FLOOD HAZARD MAP (REGULATORY ZONES): STILL USING 1983 MAP

NEW INUNDATION MAPS:
2012, 2015 AND 2020

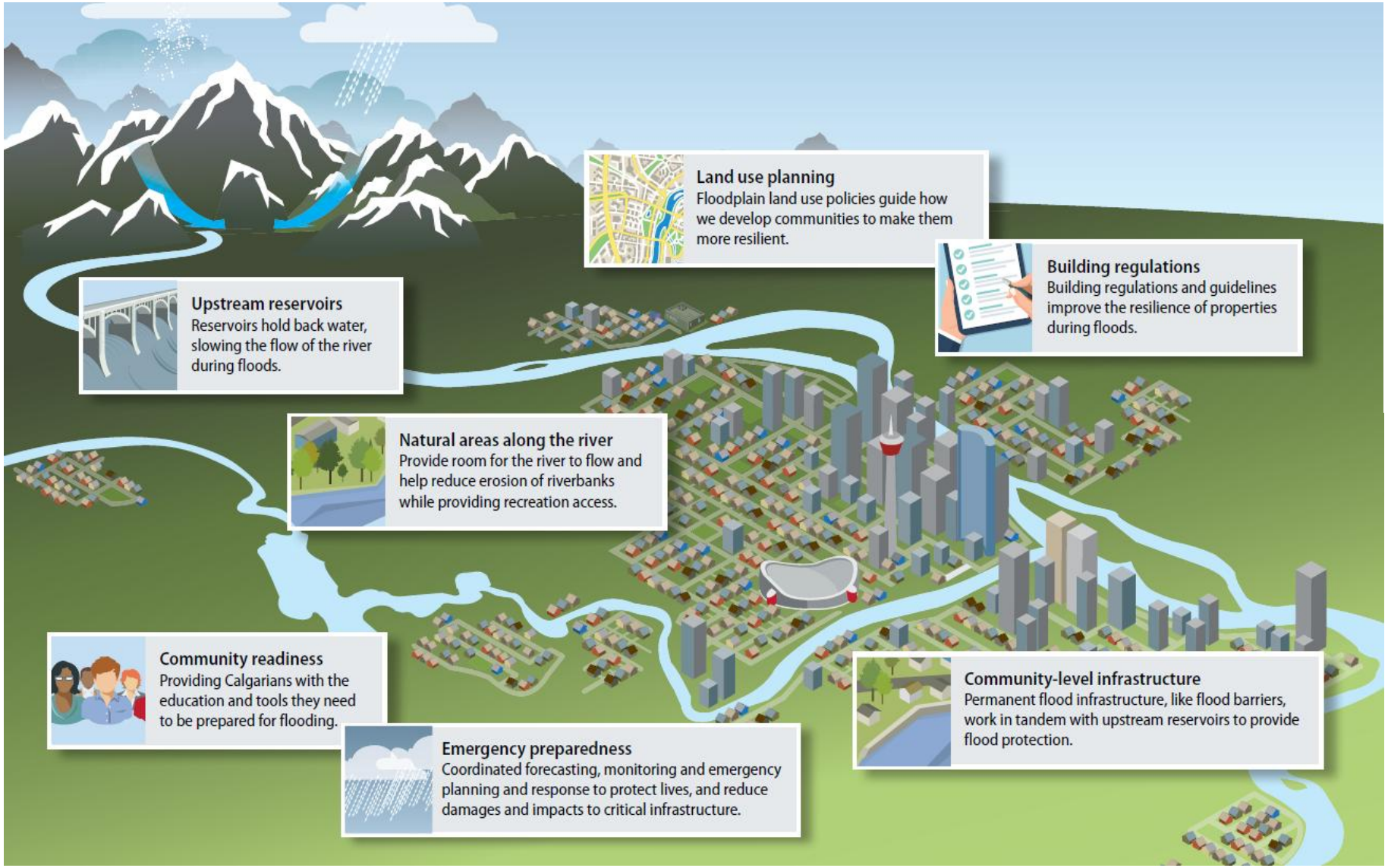
REGULATIONS UPDATED IN 2014

1983



2020

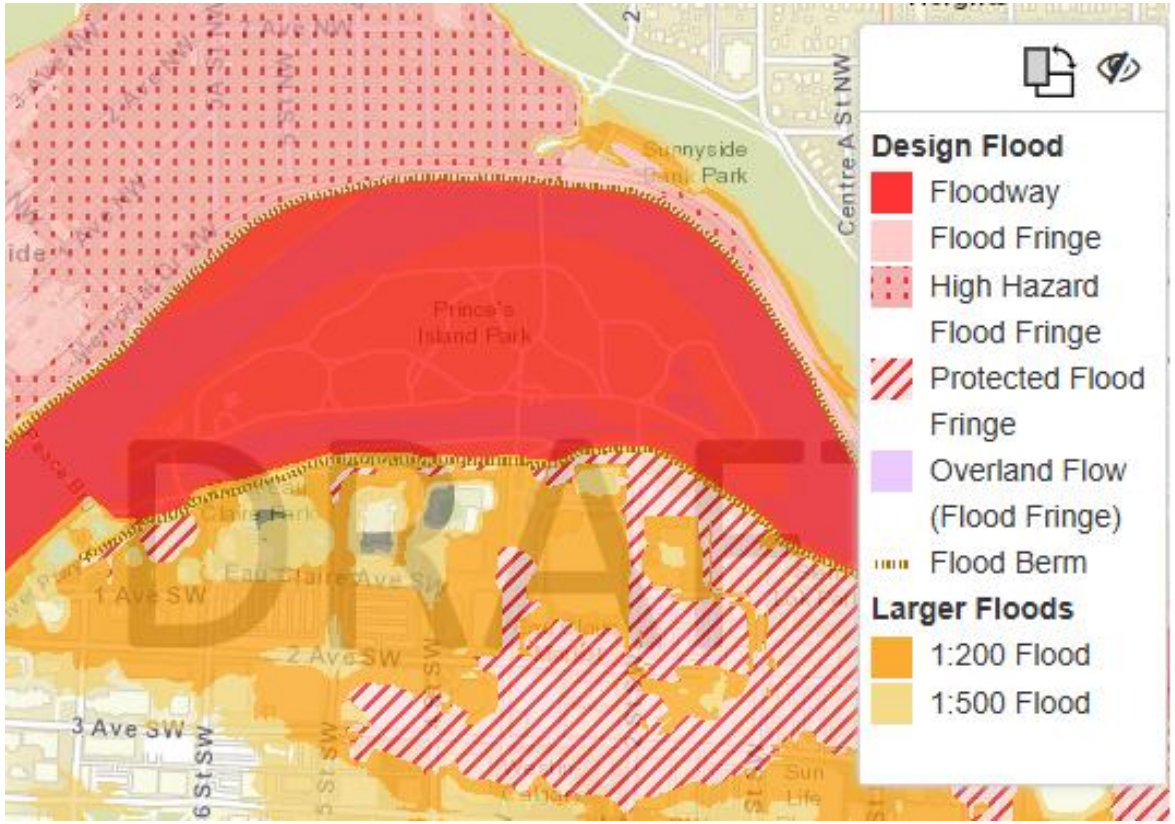
Calgary’s flood resilience plan



New flood hazard map: 2025

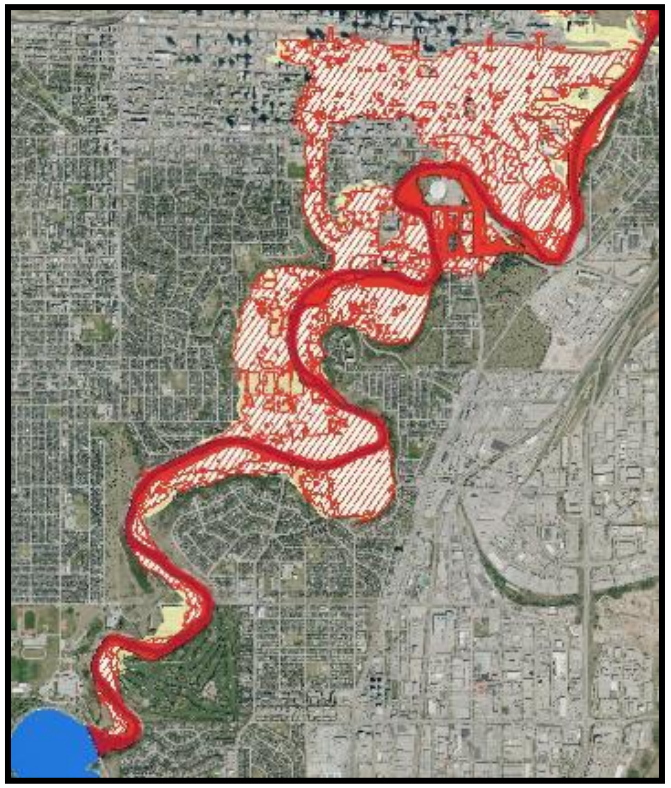
- Reflects structural mitigation (eg, areas behind flood barriers)

- New zones not currently in regulations
  - Floodway (FW)
  - ***High Hazard Flood Fringe (HHFF)***
  - Flood Fringe (FF)
  - ***Protected Flood Fringe (PFF)***



Map and regulation are 1:100;
City's combined flood resilience target is 1:200, using multiple measures to achieve

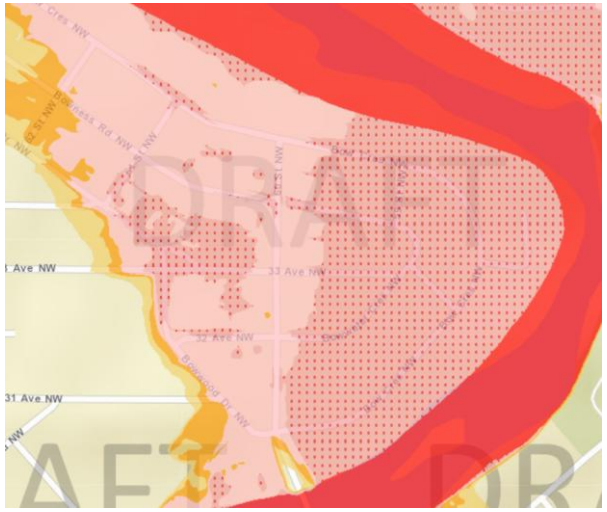
Other hazards considered for regulation



When looking at regulation and new maps, The City also assessed:

- **Loss of the historic Floodway on the Elbow River**
  - *impact on regulatory control of riparian and floodplain areas*

Other hazards considered for regulation



When looking at regulation and new maps, The City also assessed:

- **Loss of the historic Floodway on the Elbow River**

- **HHFF: deep water vs. fast moving water**
  - *should these be regulated the same?*
  - *complications of trying to regulate “islands” or “pockets” of deep HHFF*
  - *Analysed where HHFF was depth-driven or velocity-driven*
  - *Modelled impact of increased building density*
  - *Looked at areas where v>1m/s and where depth-velocity product was rated “unacceptable” risk*

Other hazards considered for regulation

When looking at regulation and new maps, The City also assessed:

- **Loss of the historic Floodway on the Elbow River**
- **HHFF: deep water vs. fast moving water**
- How to include:
  - **Erosion / channel meander**
  - **Riparian / environmental health**
  - **Flood-induced high groundwater**
  - **Future climate**

The engagement process

City conducted engagement:

- First Nations: 4 water summits
- Internal input (Planning, Emerg Mgmt, Eng, Law)
- Public (3 rounds)

Public Feedback - Heard both for and against:

- (Any) regulation in protected areas
- (Any) regulation for future climate, given uncertainty
- Anxiety around perception of potential impact on property value, insurance and future property sales

Proposed regulations:

Existing regulations:

- No new buildings or footprint increases in FW
- Buildings in FF must be floodproofed:
  - Set back 6m from FW
  - Main floor > 1:100
  - Mech/elec > 1:100
  - Backflow valve
- In greenfield, 50m Env Reserve from edge of river
- Advisory:
  - Sump pump
  - No living spaces <1:100
  - Enhance riparian areas

Updates being considered
(Note: structural protection to 1:100 now exists in most areas):

- No new buildings or footprint increases in HHFF
- Restrict vulnerable & polluting uses in FW/HHFF
- No living spaces <1:100 in FW, HHFF and FF
- In protected areas, reduce flood design elevation to 1:20 (not eliminate)
- In areas of basement flood risk (from high groundwater during river floods), require floodproofing. e.g.:
  - waterproofing
  - sump pump & backflow valve
  - water alarm
  - elevators programmed to home to a higher level

Getting the information to the public

www.calgary.ca/floodinfo

Online tools and accessibility:

- Online map
  - Flood resilience storymap
  - Click to see zone and regulatory flood elevation
- Guidance brochure on developing in our River Valleys
- Internal training, map tools, and guide for applying and interpreting regulations

Challenges & Lessons Learned

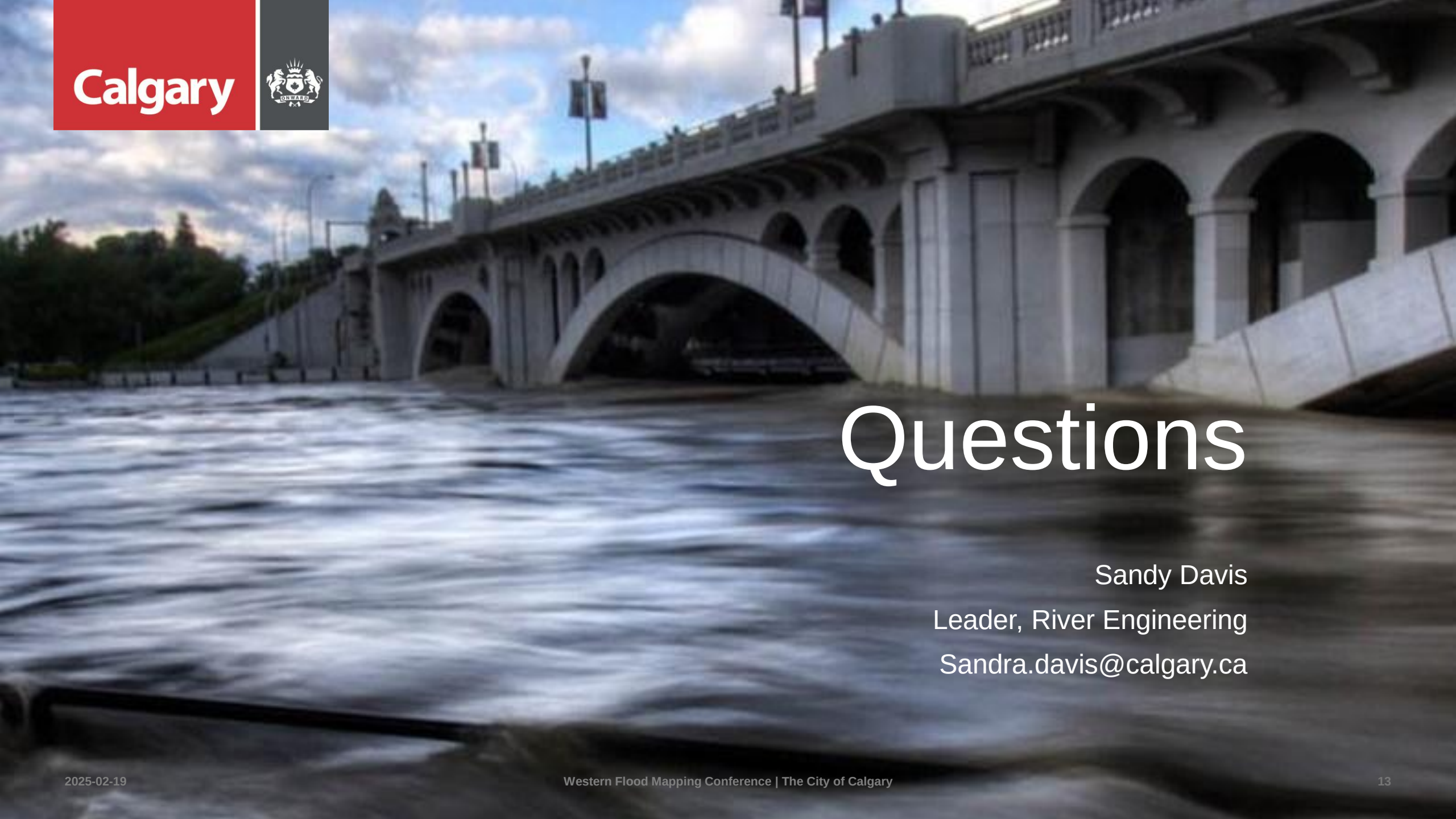
1. Updating risk / maps / policy requires internal and public education for buy-in
   - Early involvement of all disciplines and public
2. Provide flexibility for interim regulation – assess new applications based on current risk
3. Reduction in flood risk from infrastructure leads to expectation lower risk will be reflected in building regulations
   - Need education and other regulatory mechanisms to achieve river valley resilience objectives

Challenges & Lessons Learned

4. Need more groundwater data to better understand basement risk and mitigation

5. Barrier design – public realm, vegetation on dams, dam safety requirements, evacuation triggers

6. Regulations combine differently with reservoirs/barriers to impact the combined level of resilience
   - Can increase the level of resilience when combined with a reservoir, more difficult with a flood barrier



Questions

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