

Alberta

Nutrient Management and Water Quality: Striving for Practical Solutions

Barry Olson

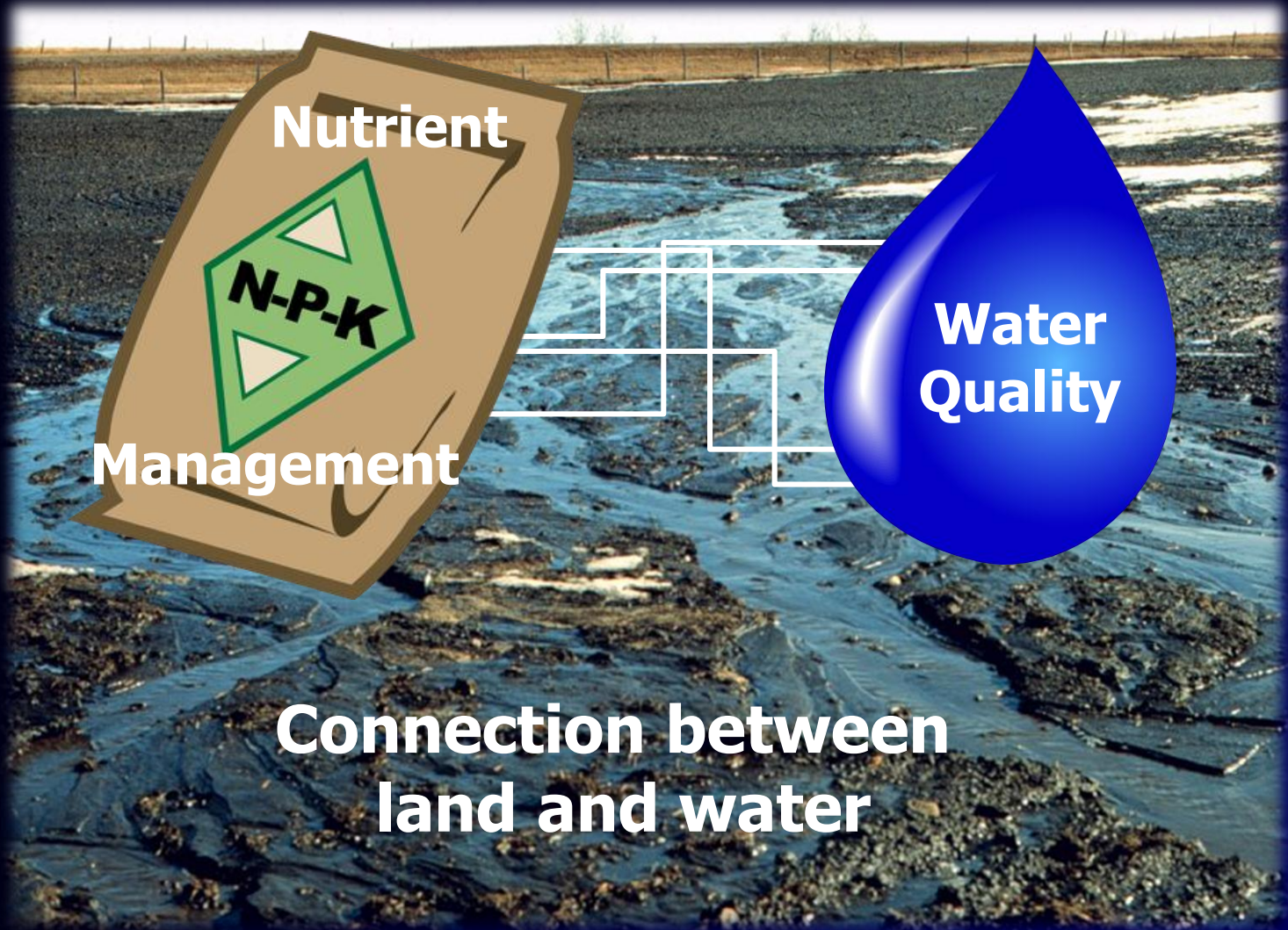
Water Quality Branch
Irrigation and Farm Water Division
Alberta Agriculture and Forestry

Getting the Most from
Nutrient Management Workshop
Lethbridge, Alberta
February 23, 2017





What's the connection?

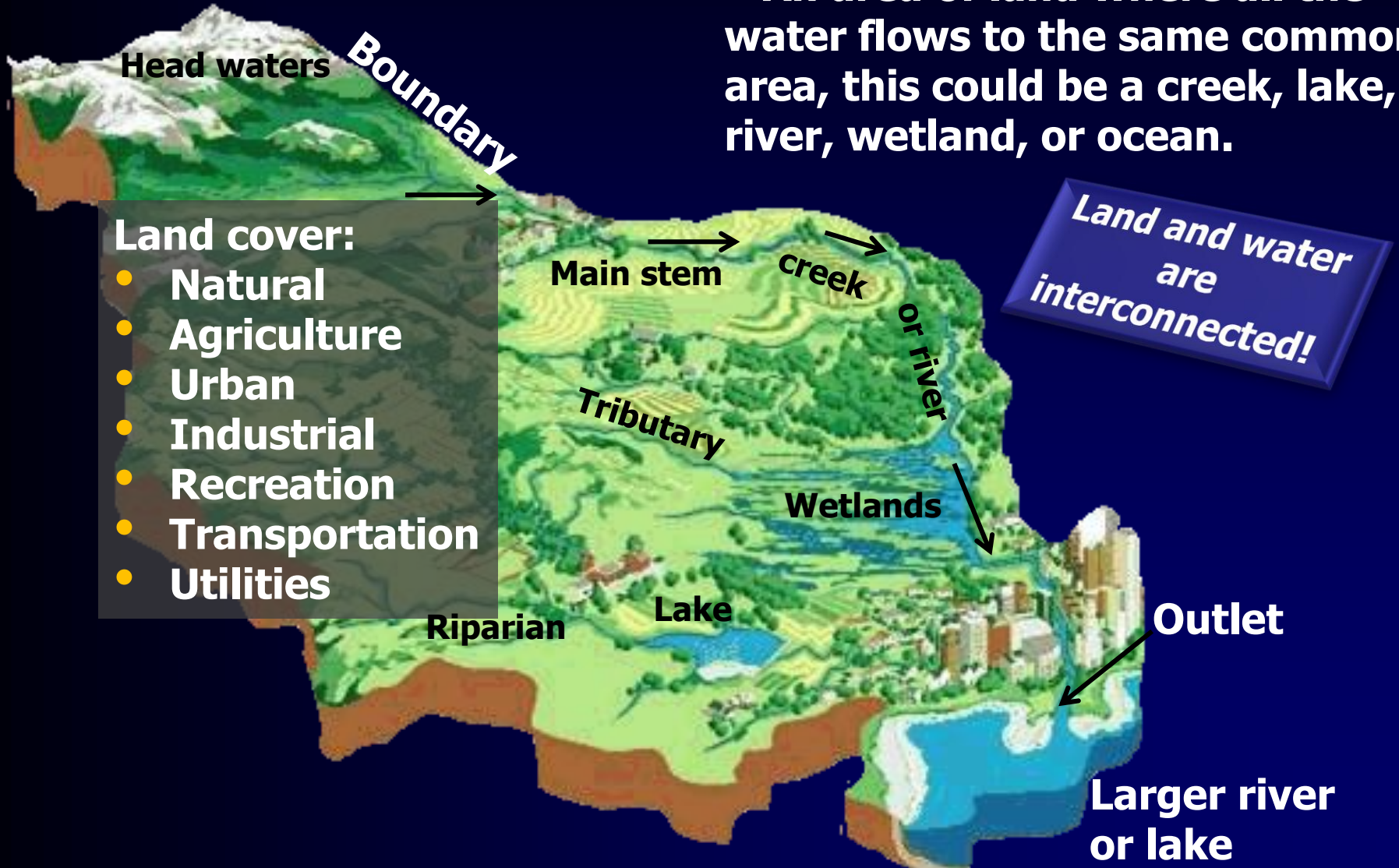


**Connection between
land and water**



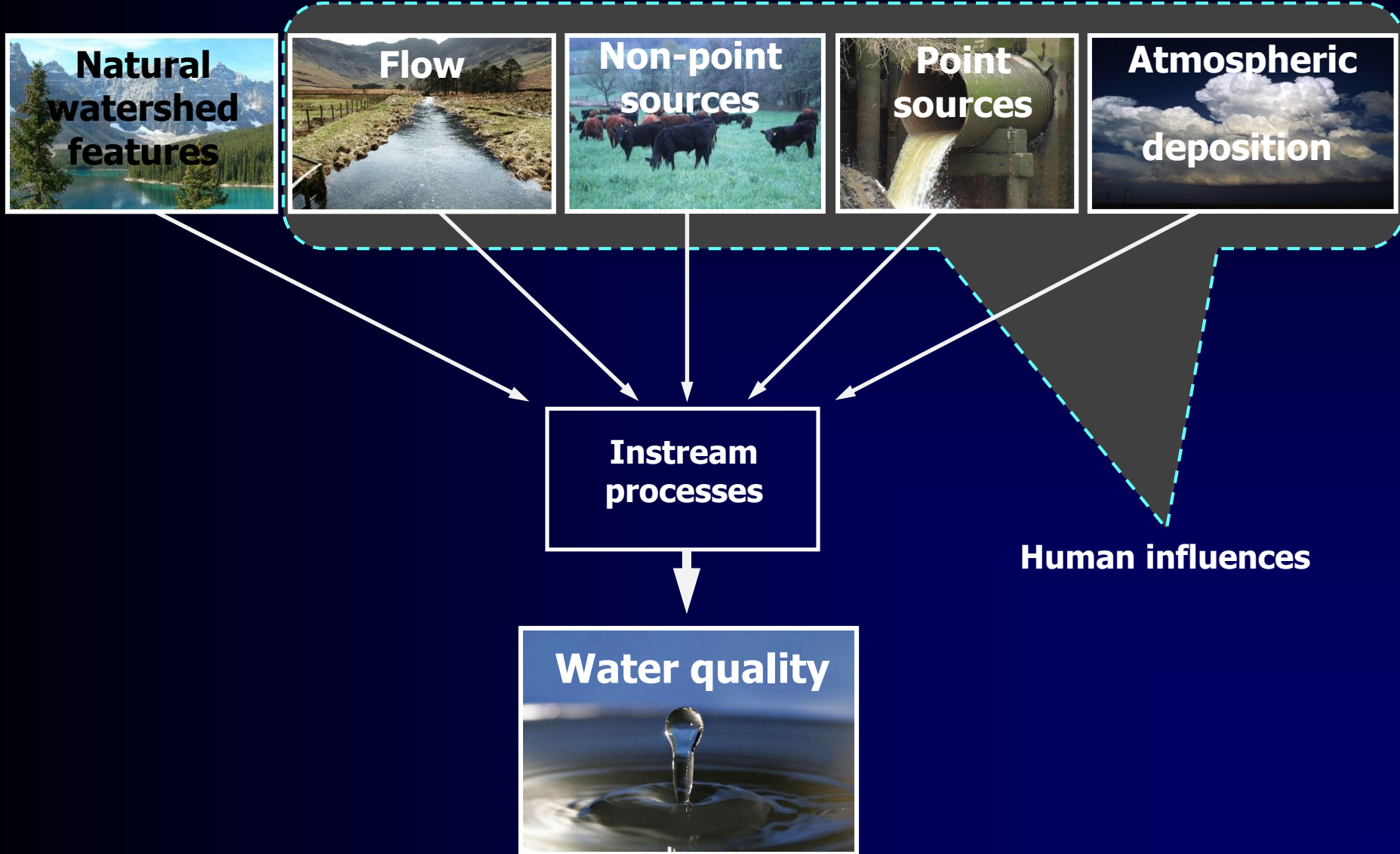
Watershed

– An area of land where all the water flows to the same common area, this could be a creek, lake, river, wetland, or ocean.





What determines water quality?





Nutrient losses



Manure spreading

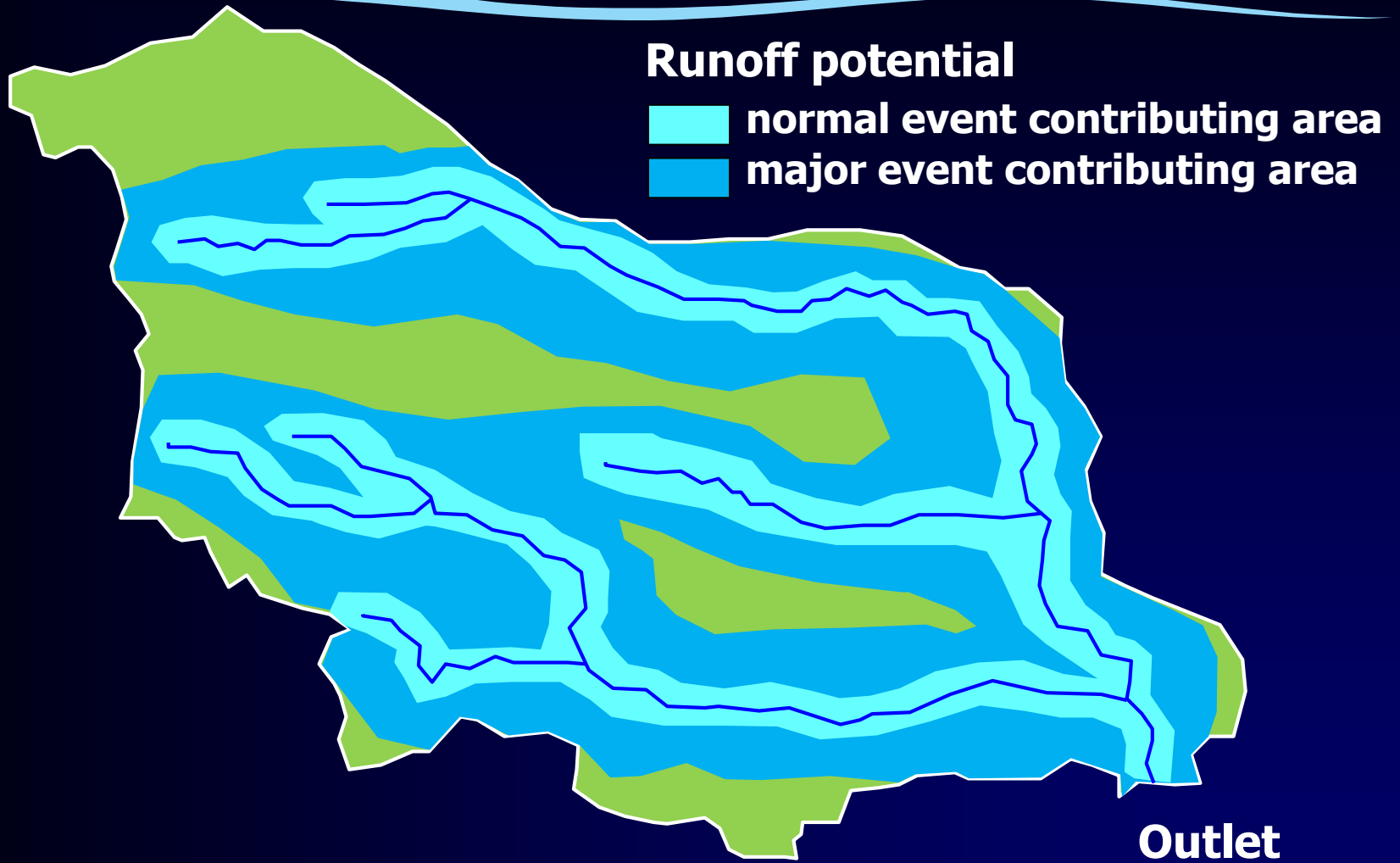
Cattle wintering

Direct access

Fertilizer



Critical source areas

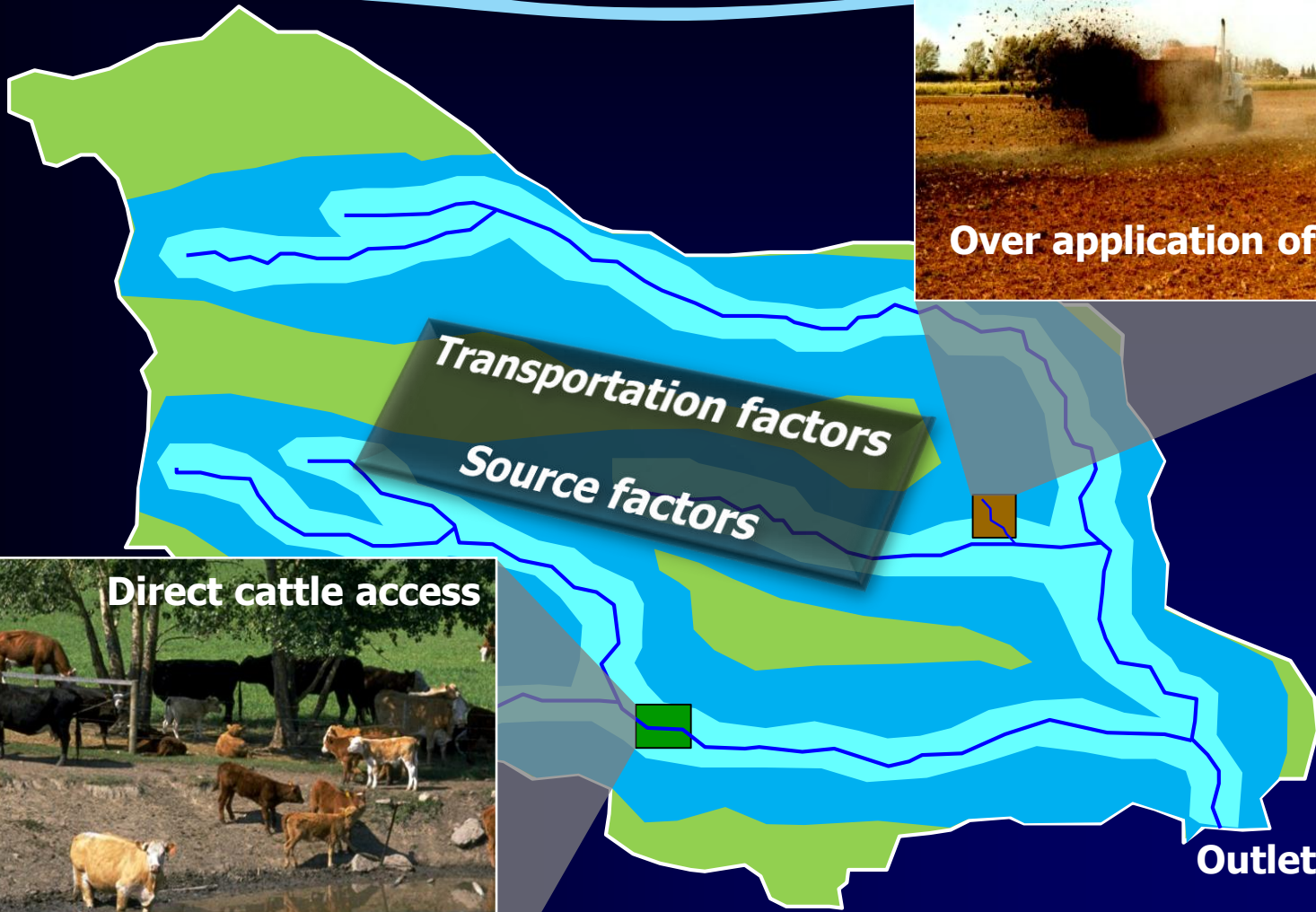




Critical source areas



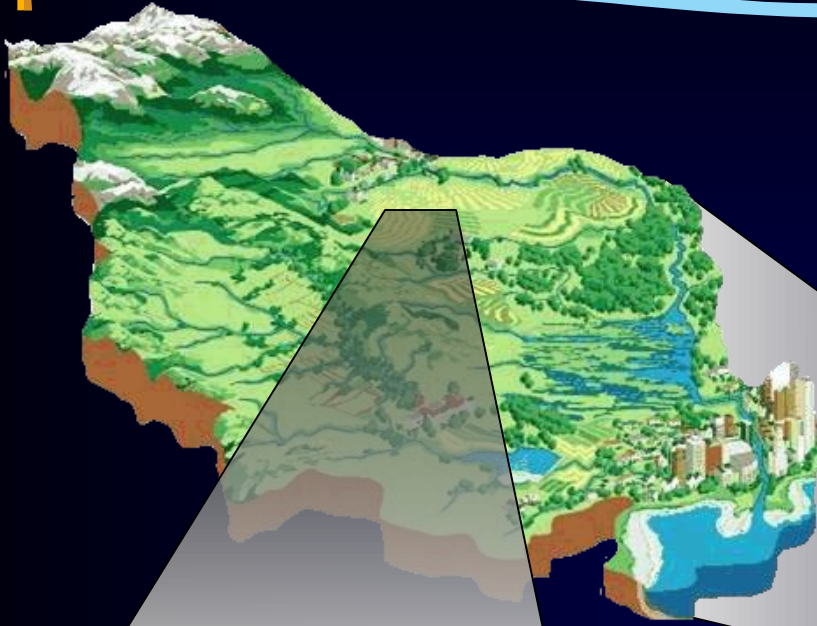
Over application of manure

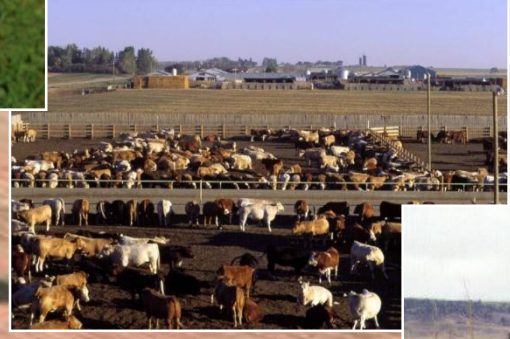
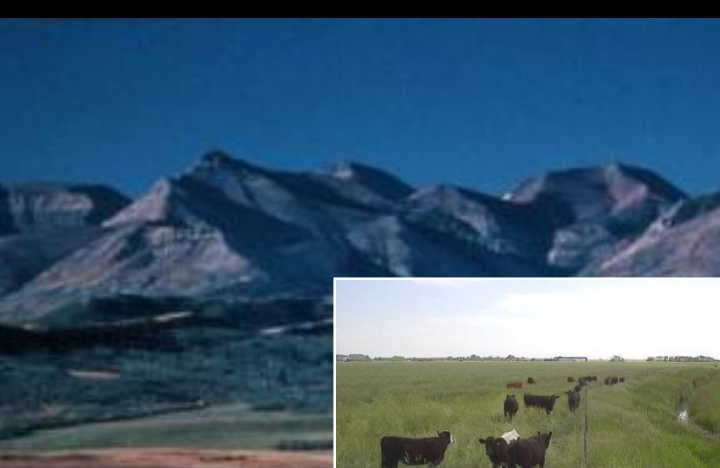
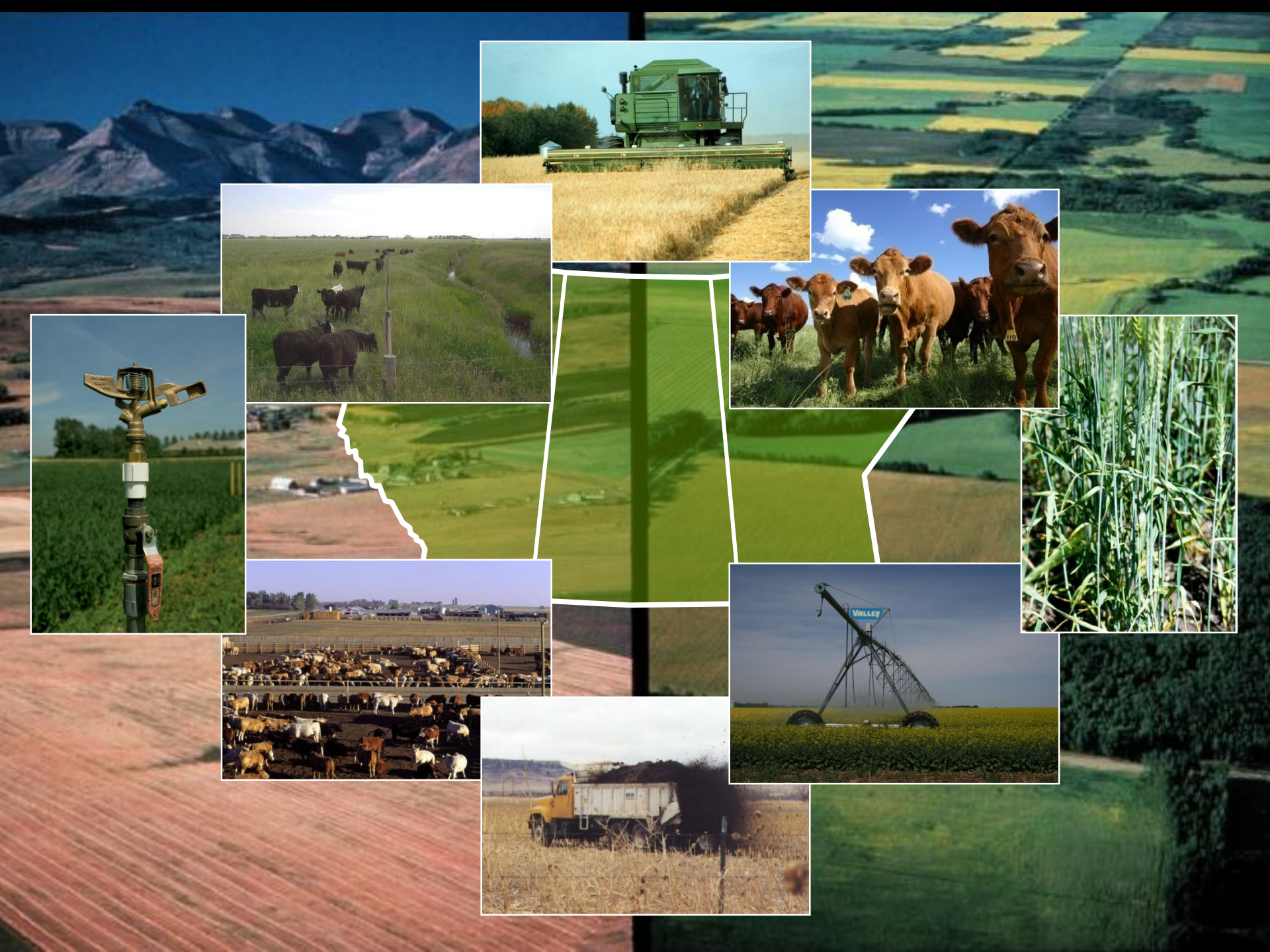


Direct cattle access



At what scale?

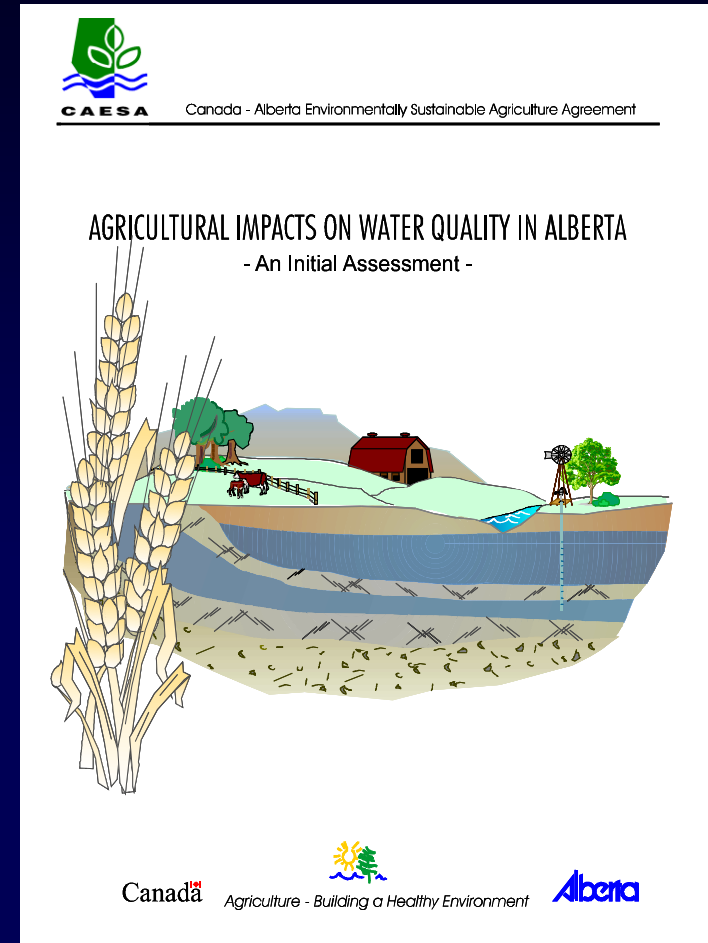






Agriculture impacts on water quality in Alberta: An initial assessment (1998)

- CAESA five-year program 1992-1997.
- Agricultural practices **are contributing** to the degradation of water quality.





Beneficial management practices (BMPs)



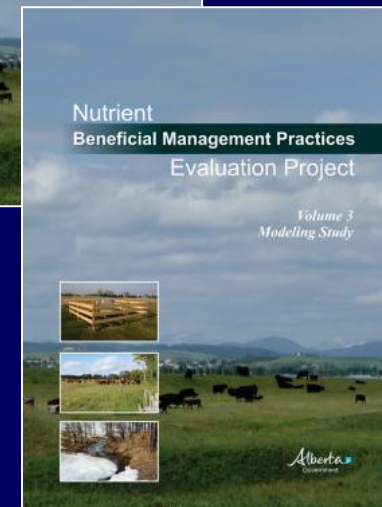


Nutrient BMP Evaluation Project

(2007-2012)

Evaluate the environmental effectiveness and economic considerations of applying BMPs in two watersheds.

BMPs at the field scale **improved** water quality, but generally at an **economic cost.**





Challenges to adopting BMPs

- **Interest**
- **Available time and priorities**
- **Convenience/practical**
- **Experience and awareness**
- **Education**
- **Age/gender**
- **Cost/resources**
- **Community involvement (e.g., watershed groups)**
- **Legislation**
- **Incentive programs**



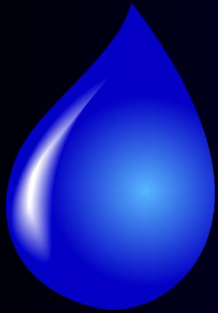


Growing Forward 2: 2013-2018

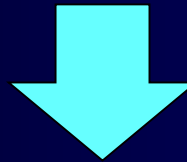
Federal-provincial-territorial partnership with a mandate to drive an innovative, competitive, and profitable Canadian agriculture and agri-food sector.

Environmental Stewardship Programs:

**Confine Feeding Operation Stewardship
On-farm Stewardship
On-farm Water Management
Agricultural Watershed Enhancement
Irrigation Efficiency**



Growing Forward 2 
A federal-provincial-territorial initiative



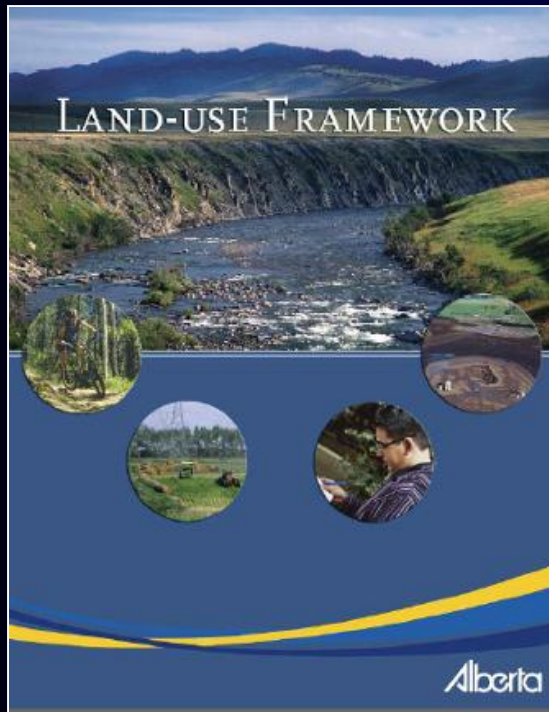
Next

**federal-provincial
Agriculture Policy Framework
(2018-2023)**



Alberta's Land Use Framework

- **Cumulative effects approach.**
- **Legislated water quality objectives are being implemented.**
- **All industries and water users will be expected to comply.**





Nutrient Objectives Project (2016-2019)

In agricultural watersheds with BMPs, what are the 'target' in-stream nutrient concentrations we are trying to achieve?

How do we know when we have succeeded?

Objectives:

- **Establish a framework for setting achievable nutrient objectives in agriculturally-dominated watersheds.**
- **Relate nutrient 'objectives' to regional nutrient 'thresholds' and aquatic ecosystem health/services.**

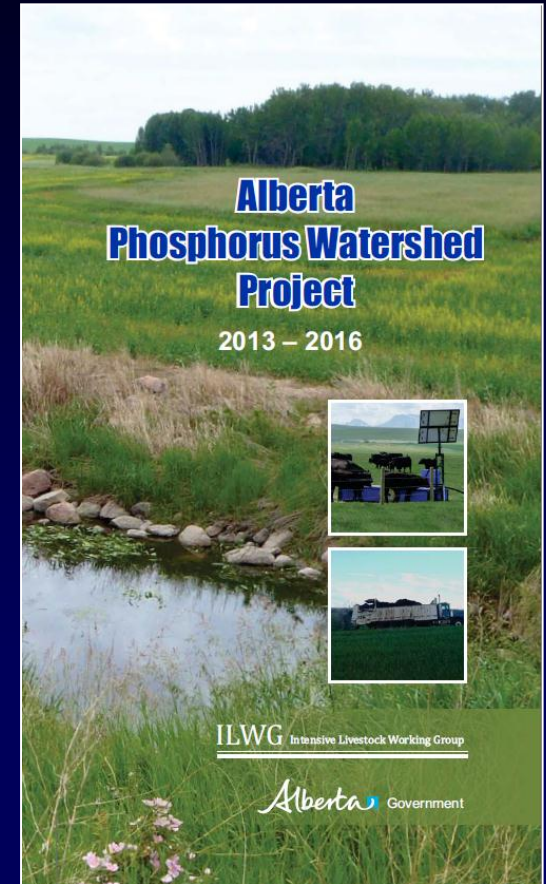
**Alberta Agriculture and Forestry
Alberta Innovates
University of Alberta
University of Calgary**



Alberta Phosphorus Watershed Project

Purpose

- To assess whether water quality can be improved at a sub-watershed scale through the wide-spread adoption of BMPs by producers.



ILWG

Alberta
Government

Red Deer County

Kneehill
County

Mountain View
COUNTY



Alberta Phosphorus Management Tool (APMT)

- Is a risk-based assessment tool, which focuses on **phosphorus loss** from farm operations and provides BMP options to mitigate risks.

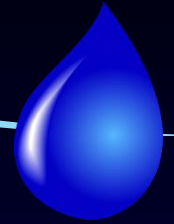
Series of questions: Yes/No or risk levels

Excel based





A few summary points



- Agriculture can have negative effects on water quality (**nutrients**).
- The **4Rs** approach to nutrient management is a good start ... (crop focused)
- The management of **livestock** need to be part of the solution (manure management)
- Critical source areas (**transport and source factors**): surface water drainage and groundwater vulnerability
- Nutrient BMP **adoption** can be slow: education/awareness, incentive programs, other economic instruments, credit trading, etc.
- Practice change at the **farm/field** level

Thank you

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