

# Agricultural Systems, Land Use Practices and Water Issues in Quebec

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# Agriculture and Water Quality

- Agriculture produces goods and bads;
- Targeting principle advocates taxing inputs and productions responsible for negative externalities;
- Regulating and eco-conditionality (making domestic support conditional on environmentally-responsible behavior) is politically easier;
- Agriculture has become more specialized and intensive, giving rise to very specific water quality concerns;
- Agriculture is regionalized and so are water quality issues.

# As agriculture evolves so are water quality issues

- It all goes back to the late 1960s and 1970s...
- Supply management programs in dairy, chicken, eggs and turkey limiting growth prospects;
- What else is there for ambitious farmers?
- 1976 Parti Québécois policy of *Nourrir le Québec* : revenue and crop insurance programs, subsidized credit, zoning to preserve ag land endowment;
- 1996-: positive ag trade balance;
- 1998: The St-Hyacinthe objectives (to boost production and exports)

# What else to do beside SM productions?

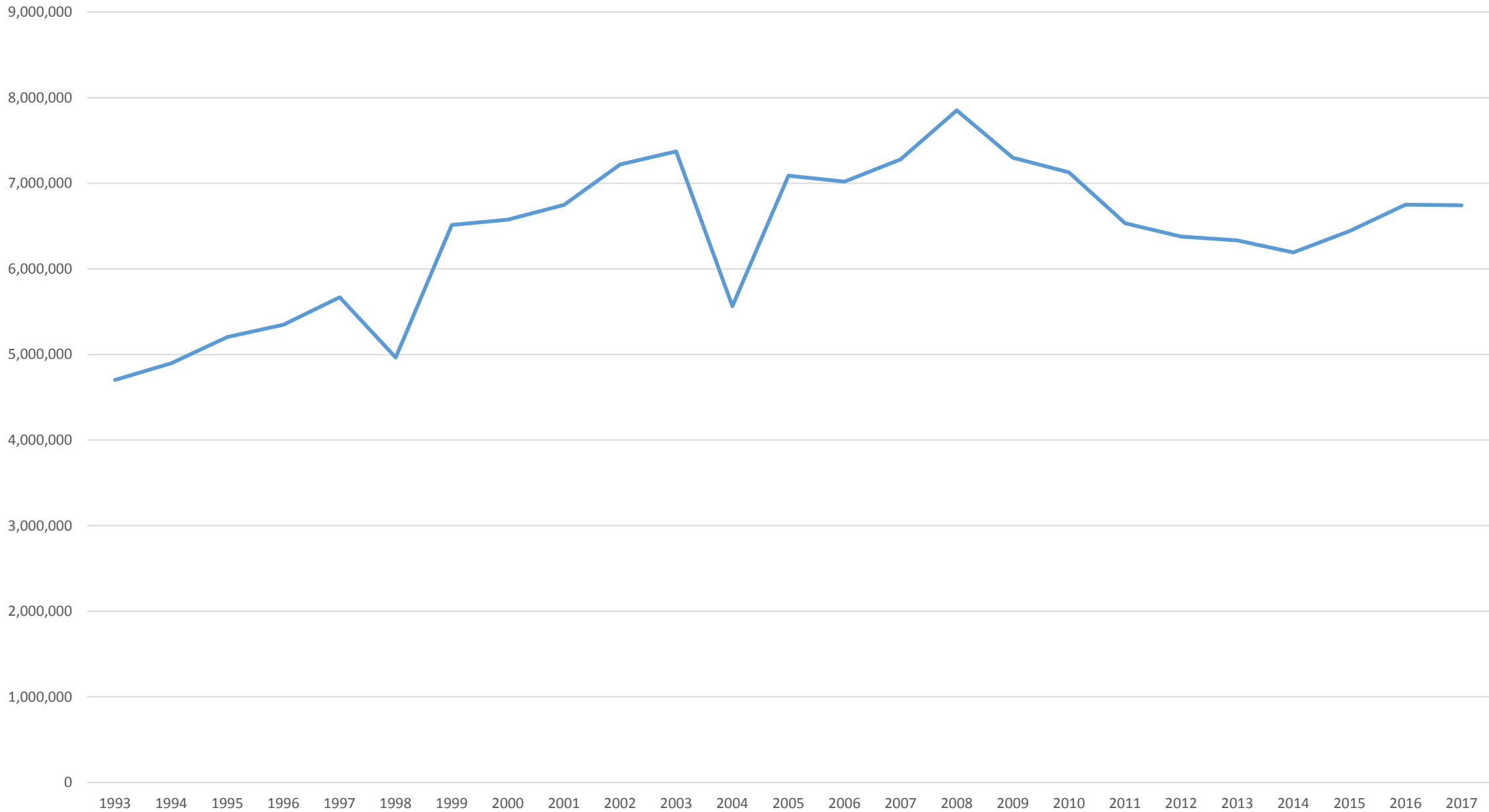
- Quebec hog production increased by 140% between 1971 and 1991, compared to 40% for all of Canada;
- ASRA for hogs began in 1978;

Table 1. Number of hog farms and average herd size in Quebec and Ontario

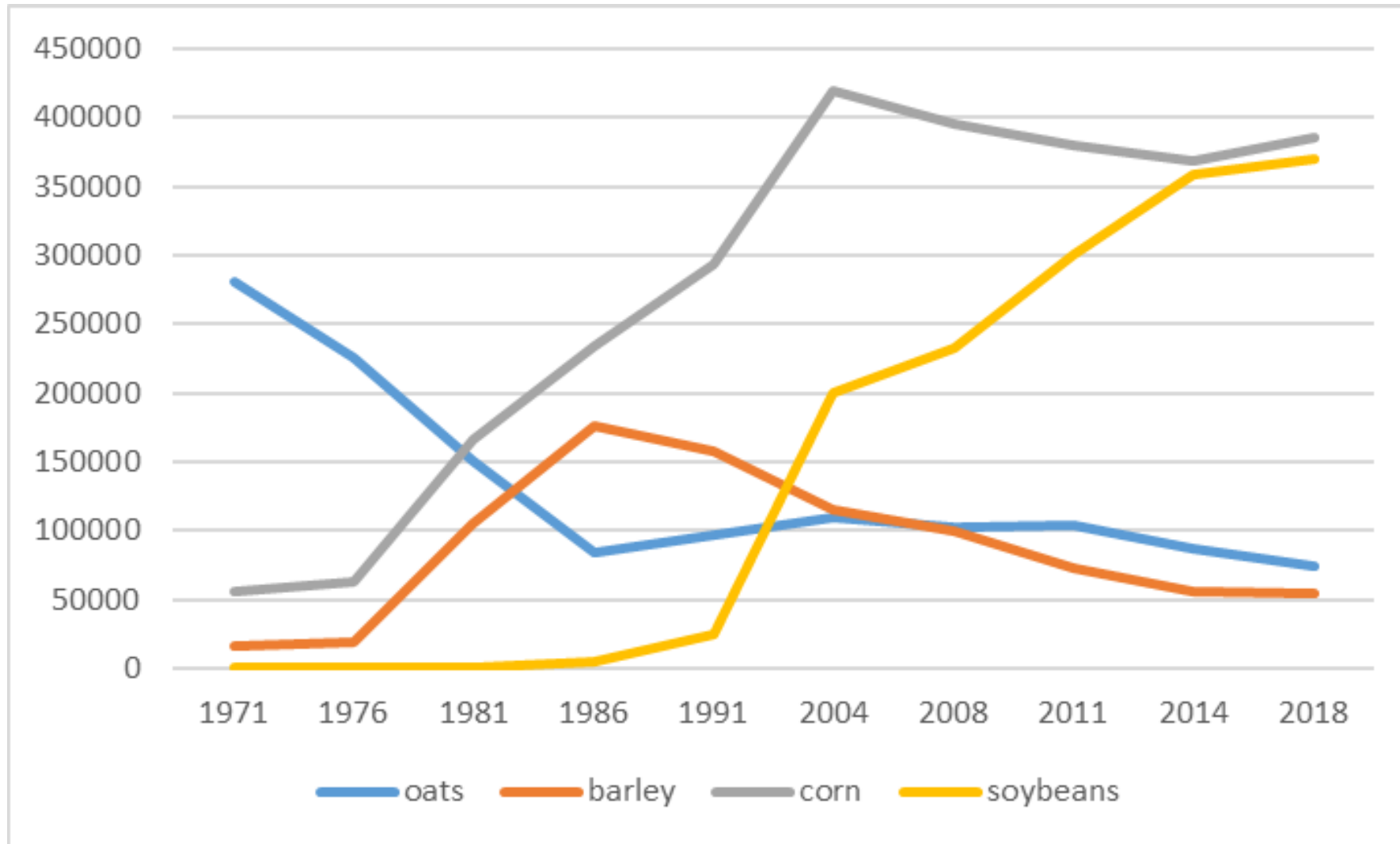
	Number of hog farms			Average herd size		
	2006	2011	2016	2006	2011	2016
QC	2,454	1,953	1,945	1,734	2,098	2,316
ON	4,070	2,556	2,760	971	1,208	1,280

Census of Agriculture, 2006, 2011 and 2016

### Hogs insured under ASRA

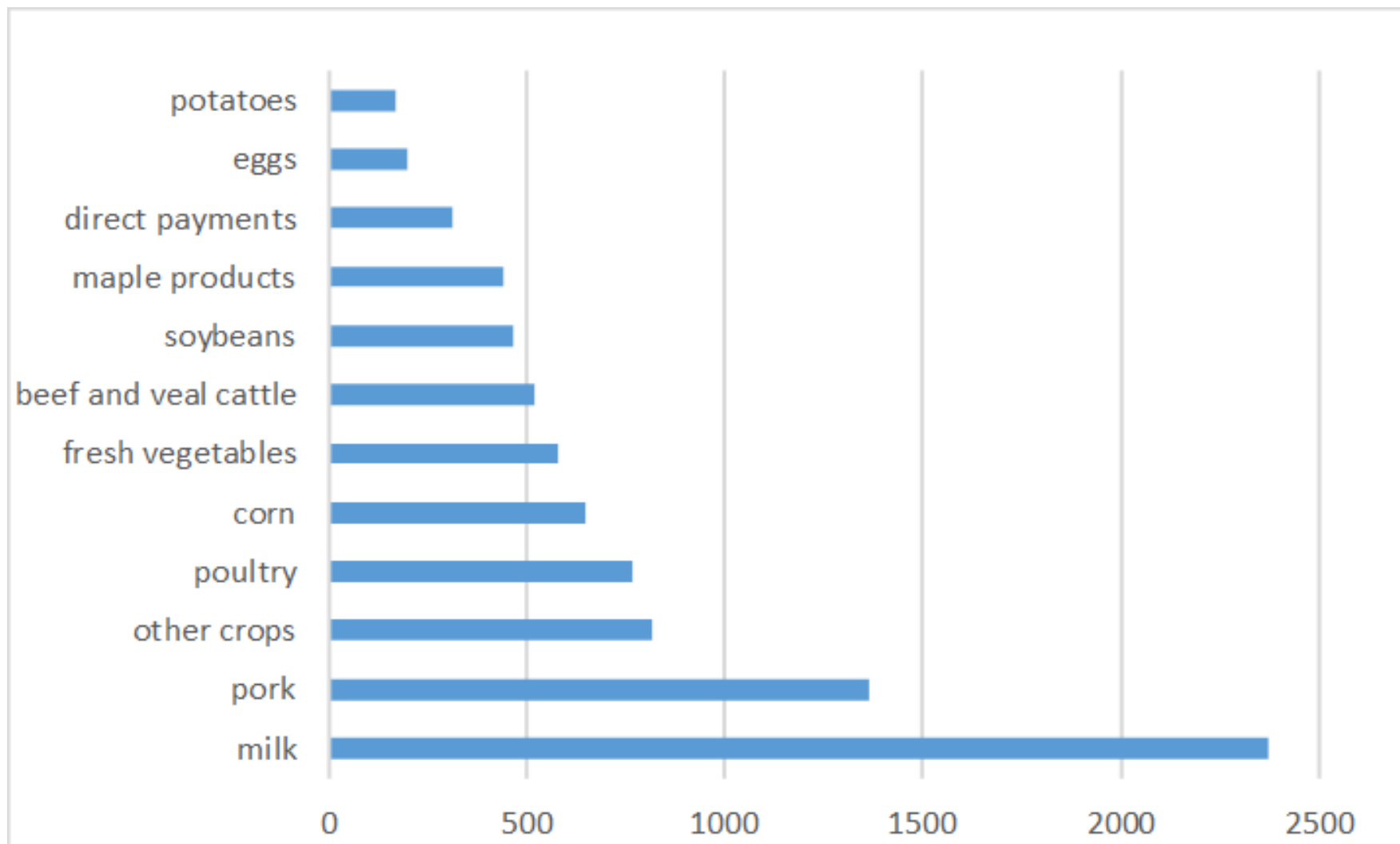


# Corn and soybeans hectares: yield gains

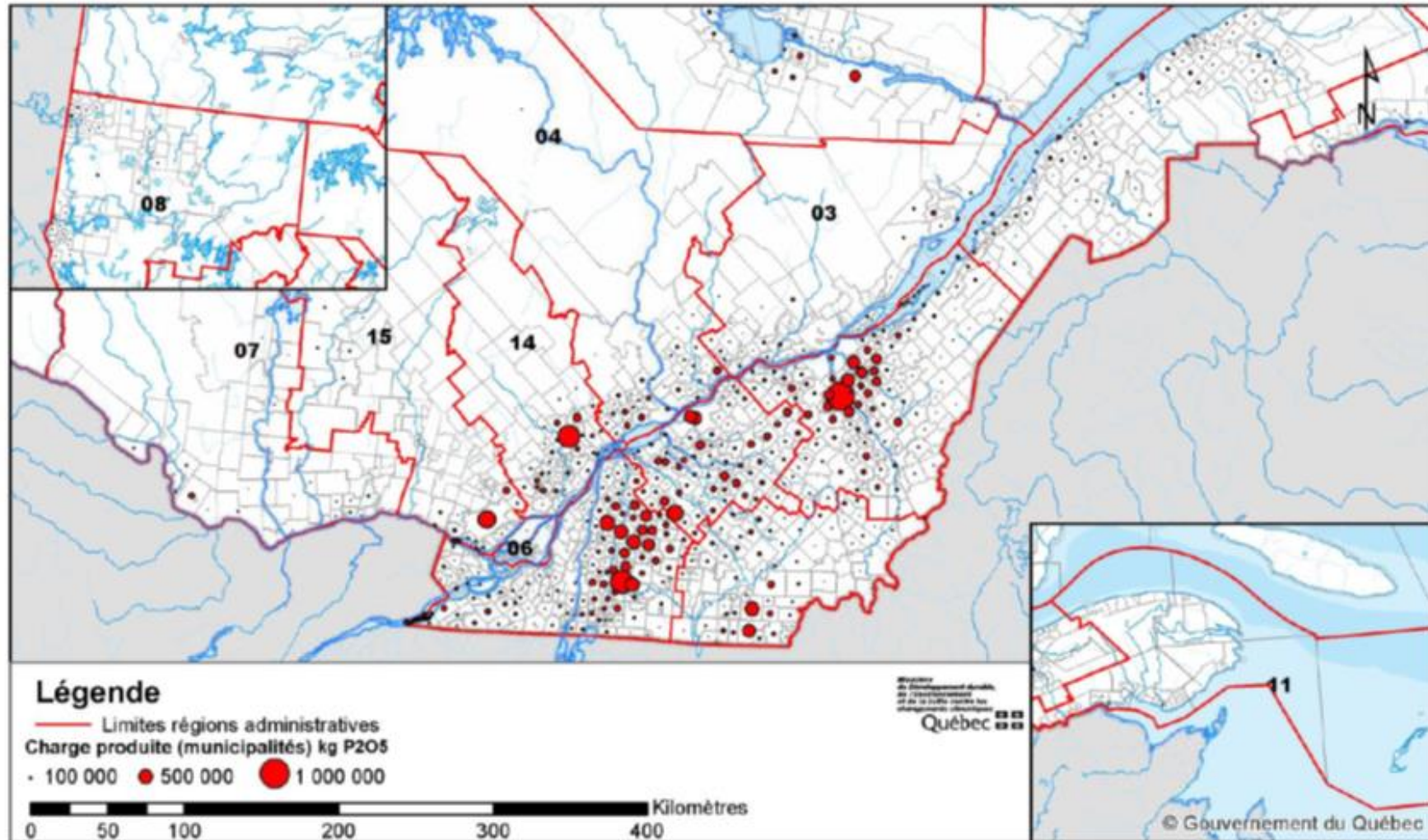


ASRA programs for corn and soybeans were terminated in 2016.

# Quebec's 2017 ag receipts



# Water quality issues: Phosphorus



Dairy and hog productions are the main sources.

The damage is regionalized.

Excess phosphorus became a very important issue in the early 2000s



# Actions to reduce phosphorus and coliforms

- Moratorium on hog expansions between 2002 and 2005;
- Moratorium on areas under cultivation in municipalities with damaged watersheds since 2004;
- Eco-conditionality tying increasingly more government programs to responsible environmental behavior since 2005;
- Strategies to promote BMP adoption (see Ghazalian, Larue and West, 2009)
- ASRA compensations tied to the production of a phosphorus report validated by an agronomist;
- Limit on number of hogs province-wide that can be covered by ASRA;
- A precise current portrait of the situation is not available.

# Demographics of rural areas

- The number of farms in Quebec declined at a rate of 0.92% per year between 2001 and 2011 while the rural population grew at a rate of 0.81% per year. The number of non-farm rural residents is increasing;
- Larue et al. (2017) showed that non-farm rural residents are risk averse when it comes to water quality improvements generated by BMPs and that many of them are willing to have farmers pay for risky water quality improvements;
- Cost-share programs will be a harder sell as weight of rural non-farm residents keeps on increasing.

# Water Quality Issues: Antibiotics

- Preventive and curative uses of antibiotics in livestock productions increasingly regulated;
- Public opinion prompted recent actions by governments and industry to limit the use of category 1 antibiotics and eventually other antibiotics that cause lesser resistance problems;
- Over the last 30 years, Quebec farmers needed a prescription from a veterinarian to purchase antibiotics. This requirement is new in other provinces.

# Pesticides

- GM corn and soybeans hectares have grown rapidly and so has the demand for pesticides;
- Several municipalities in Quebec present high risk of pesticide contamination (see <http://www.agr.gc.ca/eng/science-and-innovation/agricultural-practices/water/pesticides-indicator/?id=1462401144426>)
- New regulations will help track use of certain pesticides;
- New Quebec agricultural policy recognizes that pesticide use has grown significantly in recent years;
- Environmental clubs promote localized treatments with reduced dosage and spraying methods to minimize drift;
- Tamini (2011) showed that environmental clubs have had a significant positive influence on BMP adoption; Ghazalian, Larue and West (2009) also report fairly high pesticide-related BMP adoption rates. Large farms are keener on BMP adoption. Is enough being done?

# Institutional failures and pesticides

- Louis Robert, an agronomist, was fired by MAPAQ for leaking information to the media about the mass resignation of researchers working at CEROM, a research center on grain production.
- The researchers were reportedly pressured by members of the board of directors to change the results of some of their research on pesticides and the dissemination of their results;
- The board was dominated by industry representatives. The president of Quebec's grain growers resigned as president of the board of directors;
- The second controversy is about the shelving of a report on pesticides produced two years ago by a MAPAQ-sponsored research center.

# Conclusions

- The abatement curve in Ghazalian, Larue and West (2010) suggests that water quality can be improved at low cost up to a point beyond which costs increase rapidly;
- Farmers are sensitive to water quality degradation and comply with phosphorus regulations;
- Actions have been undertaken to stop the problems from growing, but is enough being done to reduce water quality problems?
- MAPAQ too close to farmers and farm input suppliers and too distant from MDDELCC?
- Inputs from experts in environmental economics, ag policy, and production economics needed in debate over regulatory and policy orientations.
- Time to develop a data collection strategy.