

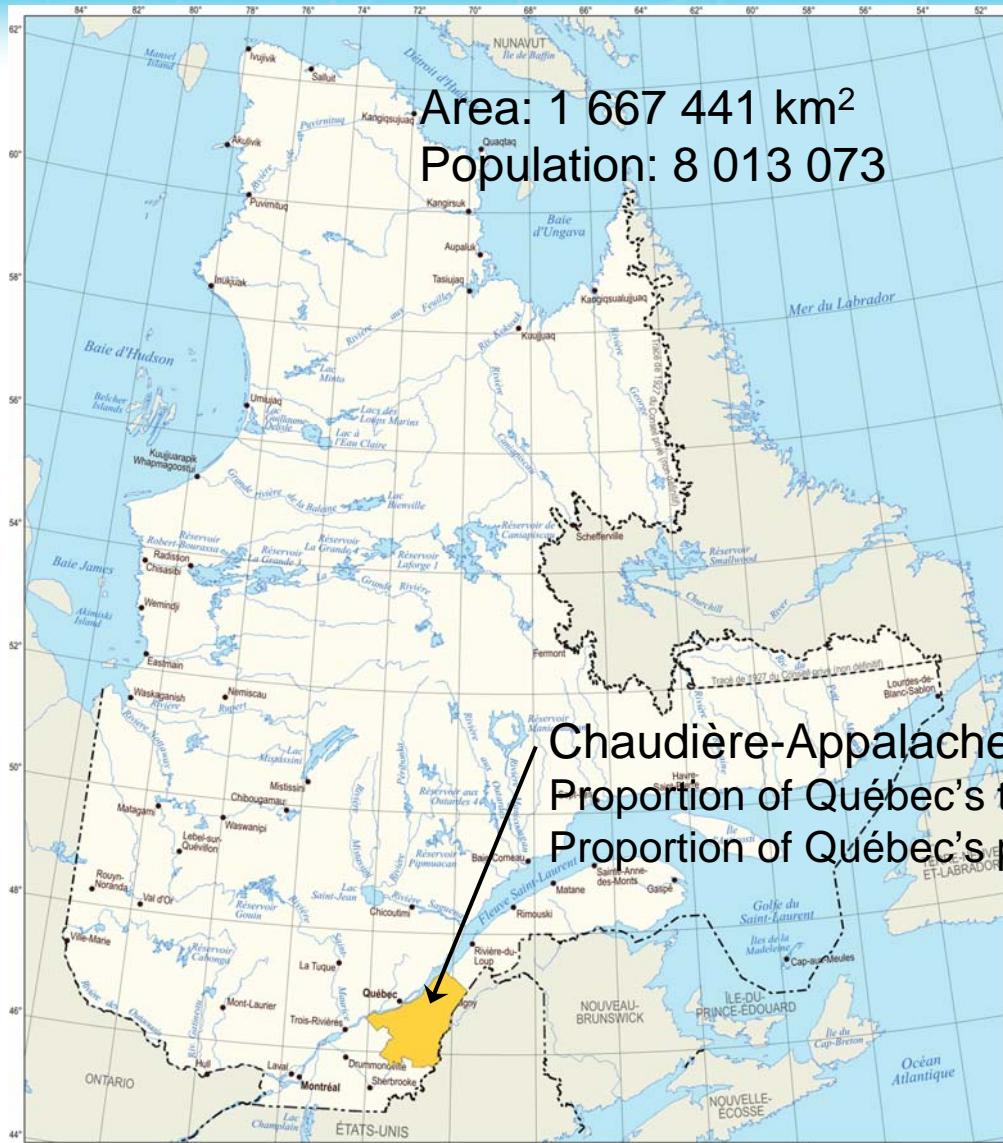
Land accounting in Québec: Pilot project for a sub-provincial area

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Environmental Accounting
Ottawa, 2 October, 2012



Province of Québec



Pilot Project

- Objectives:
 - To test the feasibility of creating land accounts for Québec using existing data
 - To establish a statistical infrastructure for Québec land accounts in accordance with the SEEA's concepts, classifications and methodologies
 - To prompt the interest of Québec government ministries and agencies for applying land accounts to sector and environmental policies
- Characteristics of land accounts:
 - Area of land by land cover type around 2000 and around 2006 and change in land cover
 - Existing data only
 - Precision sought: 25 m or 100 m
 - Custom projection: Albers Equal-Area Conic (Quebec NAD83)



Methodological Steps

1. Defining the land cover classification
2. Integrating the data into two land cover maps, circa 2000 et circa 2006
3. Applying the grid to the land cover maps
4. Developing the physical account for land cover and the land cover change matrix

Proposed land cover classification for Québec

Proposed classification for Québec			SEEA Land cover classification	
	Class	Sub-class		
20	Water		<ul style="list-style-type: none"> Inland water bodies 	
30	Exposed land		<ul style="list-style-type: none"> Terrestrial barren land Sparsely natural vegetated areas (<i>part of</i>) 	
31	Snow and ice		<ul style="list-style-type: none"> Permanent snow and glaciers 	
34	Artificial surface		<ul style="list-style-type: none"> Artificial surfaces (including urban and associated areas) (<i>excluding extraction sites</i>) 	
50	Shrubland		<ul style="list-style-type: none"> Shrub cover area Sparsely natural vegetated areas (<i>part of</i>) 	
80	Wetland		<ul style="list-style-type: none"> Shrubs and/or herbaceous vegetation, aquatic or regularly flooded Tree covered area (<i>part of</i>) 	
100	Herb covered area		<ul style="list-style-type: none"> Grassland Sparsely natural vegetated areas (<i>part of</i>) 	
120	Agricultural land		<ul style="list-style-type: none"> Herbaceous crops Woody crops Multiple layered crops? 	
200	Forest	210	Coniferous forest	<ul style="list-style-type: none"> Tree covered area
		220	Deciduous forest	
		230	Mixed forest	

Description of data

Main data sets:

- Land cover, circa 2000-Vector (Geobase):
 - Canada land cover
 - 1999-2001 Landsat images classification
 - Spatial resolution: 1:50 000
 - Precision: 30 m
- Forest inventory – Ministère des ressources naturelles et de la Faune du Québec (*Department of natural resources and wildlife of Québec*):
 - Vector cartography of Québec's forests for resources management: forest stands' composition, age, density, height and ecological characterization; characterization of non-forest lands; etc.
 - 2004-2010
 - 1:20 000 aerial photos interpretation + field verification
 - Precision varies according to the elements being delimited

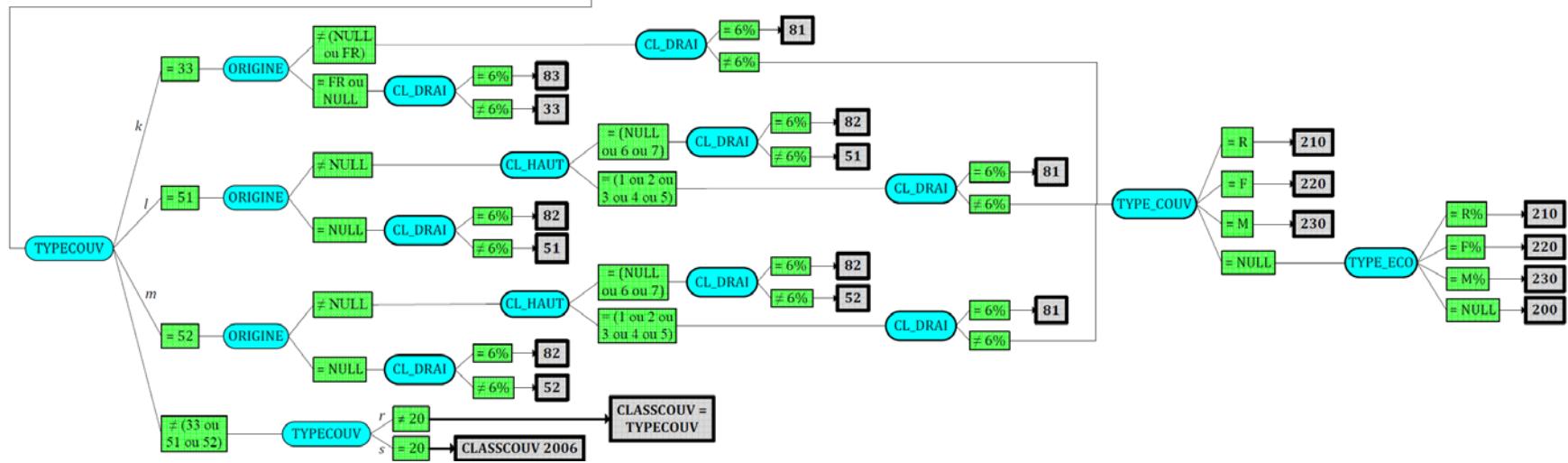
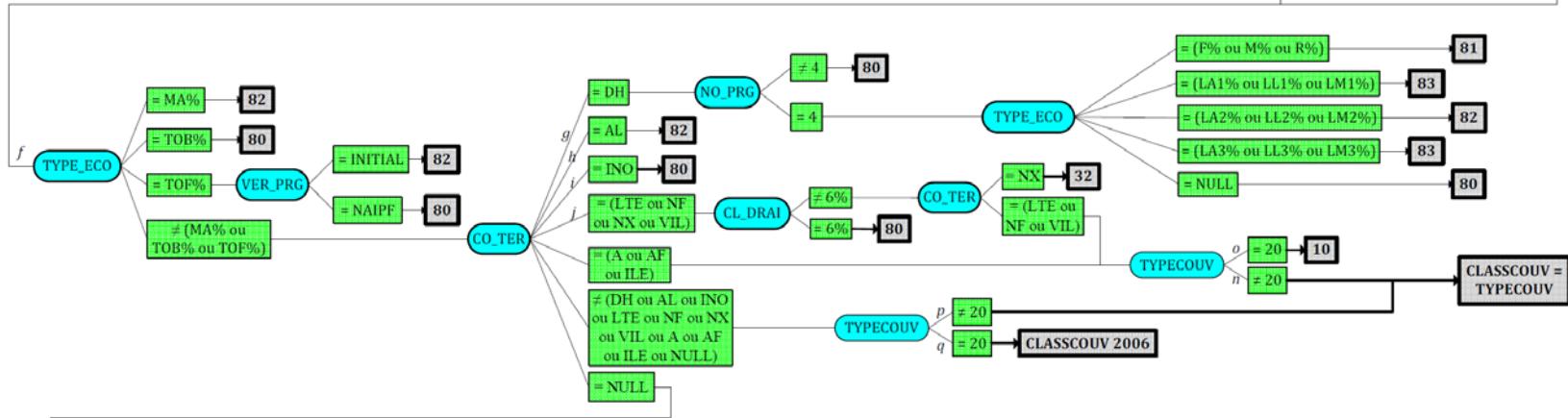
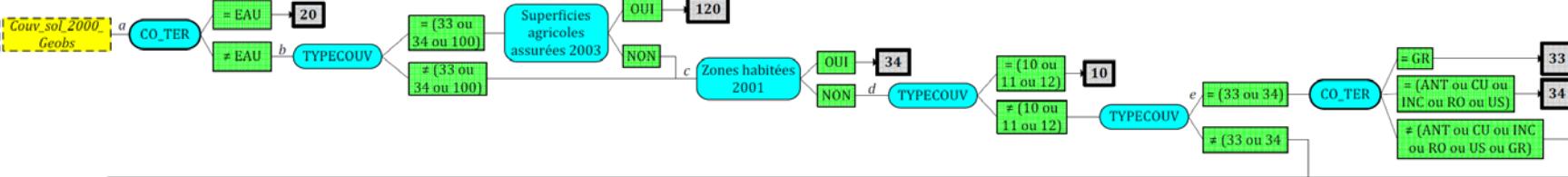
Description of data (cont'd)

Other data sets:

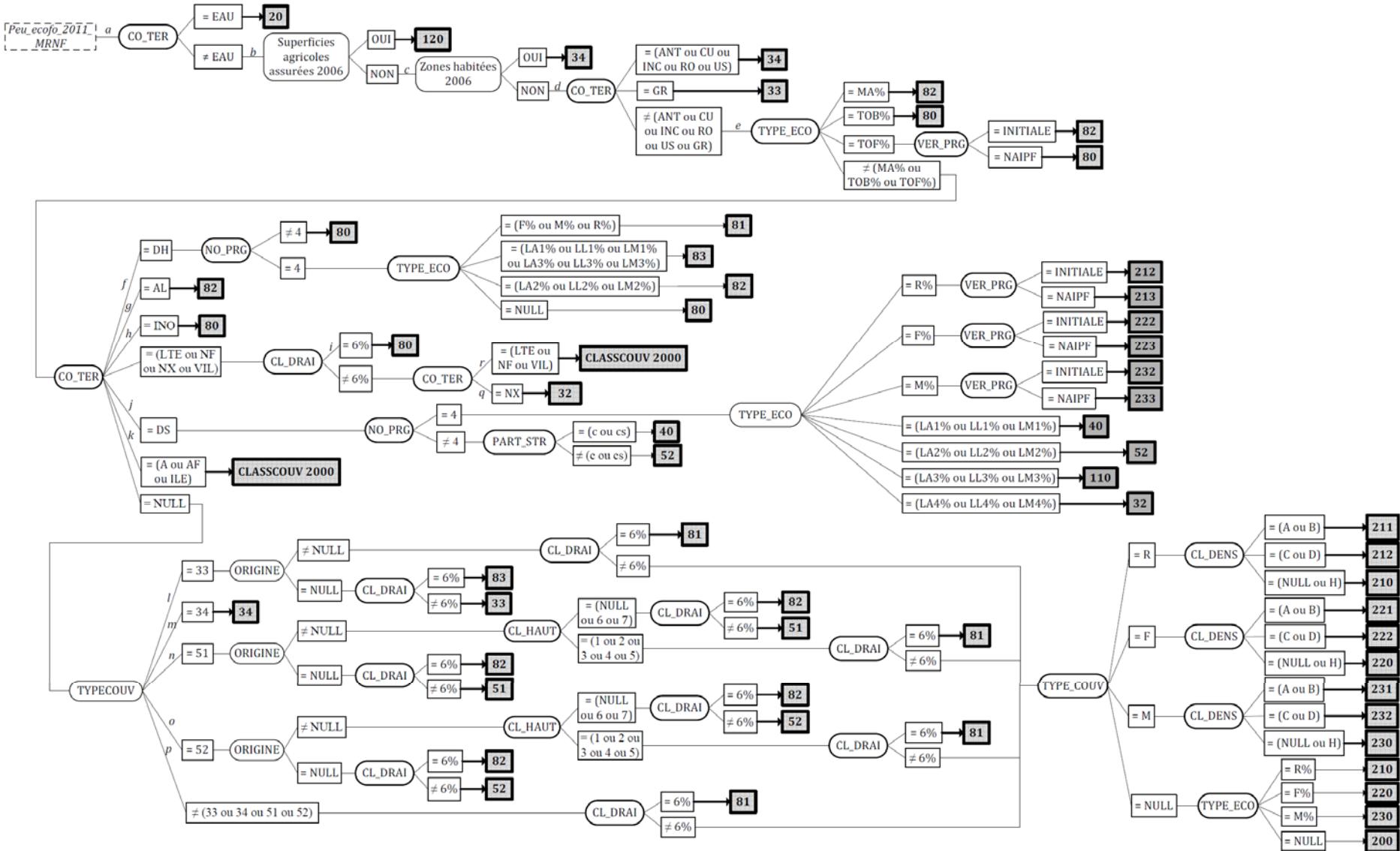
- Insured Crop Data Base (Base de données des cultures assurées – BDCA, Financière agricole du Québec)
 - About 90% of Québec's cultivated lands
 - annual
 - Interpretation of aerial photos + field verification
 - Precision of less than 1 m
- Settlement areas (Statistics Canada):
 - Limits of Canada's settlement areas
 - 2001 and 2006
 - Use of the Population Census geography + interpretation of mainly high-resolution satellite images



Decision tree for circa 2000 data

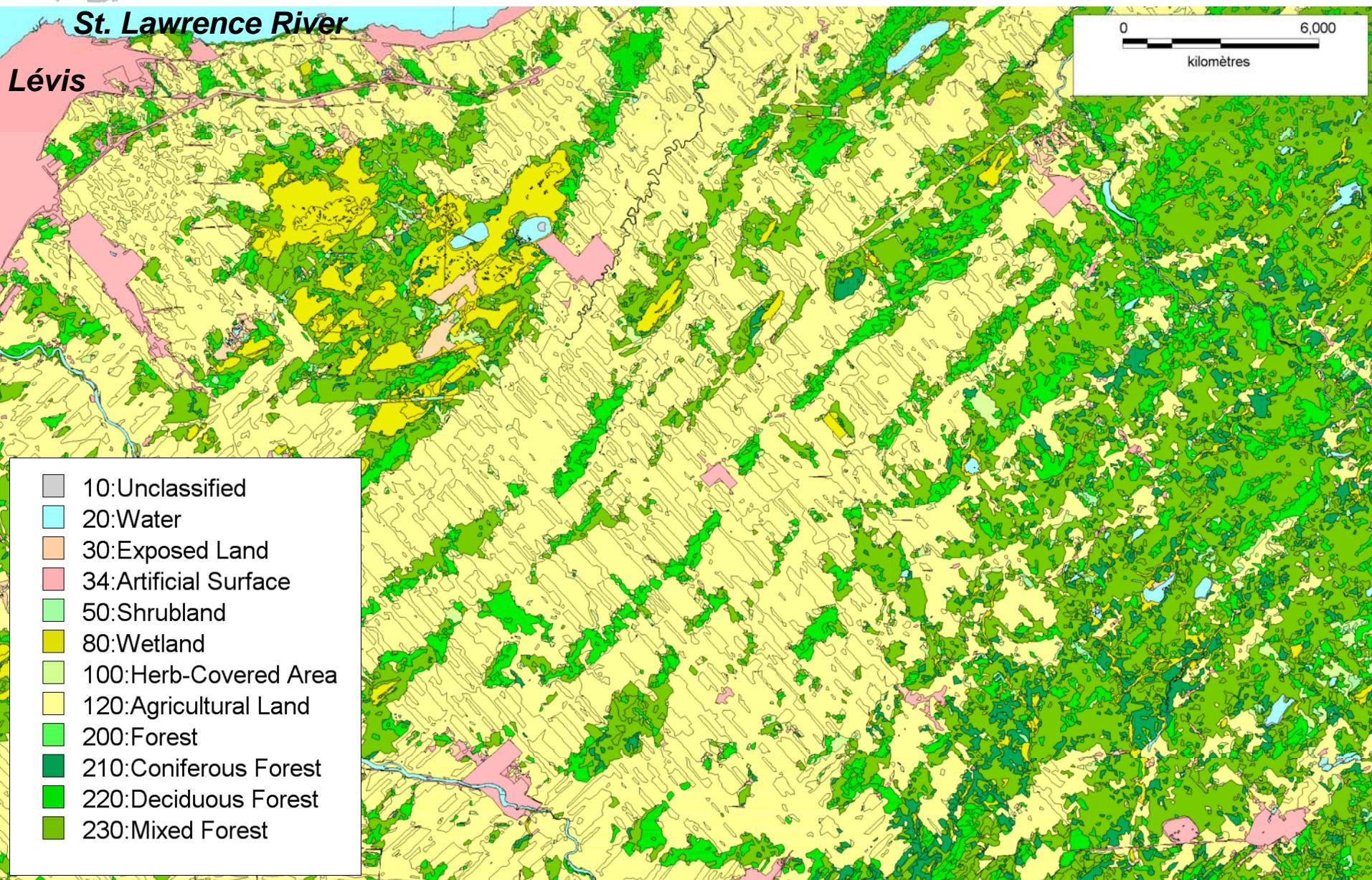


Decision tree for circa 2000 data



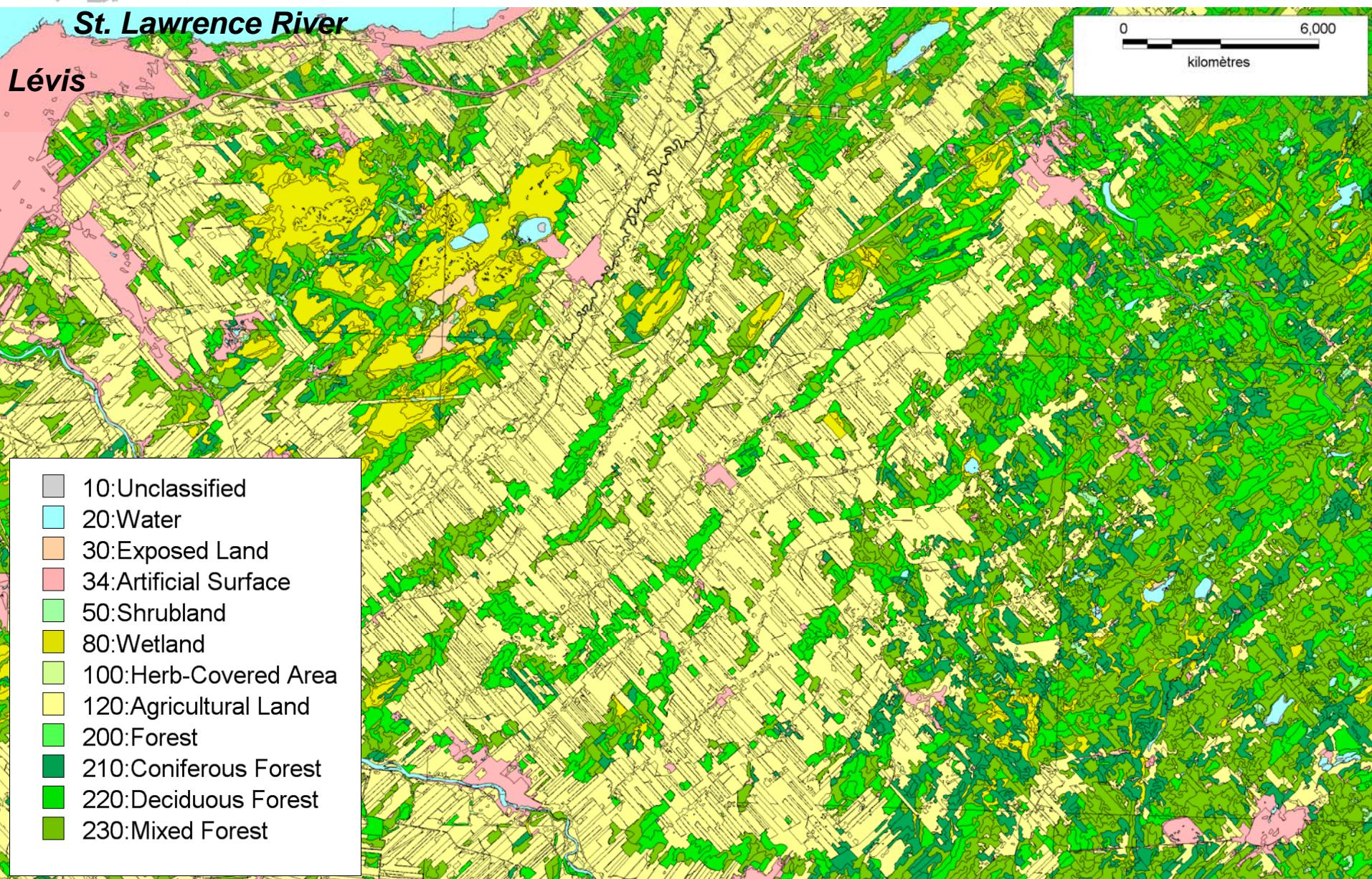


Land cover, part of the Chaudière-Appalaches region, circa 2000



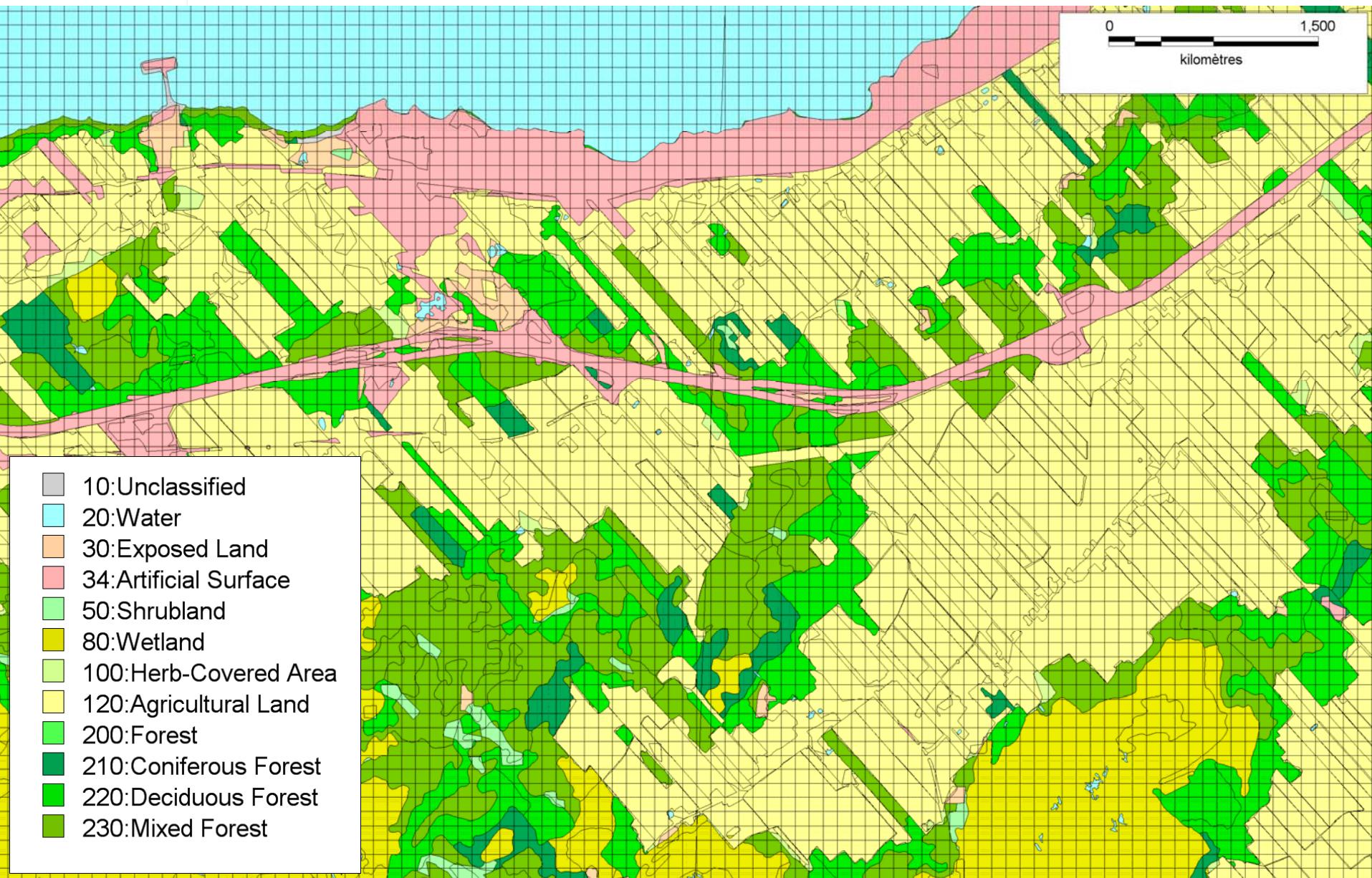


Land cover, part of the Chaudière-Appalaches region, circa 2006



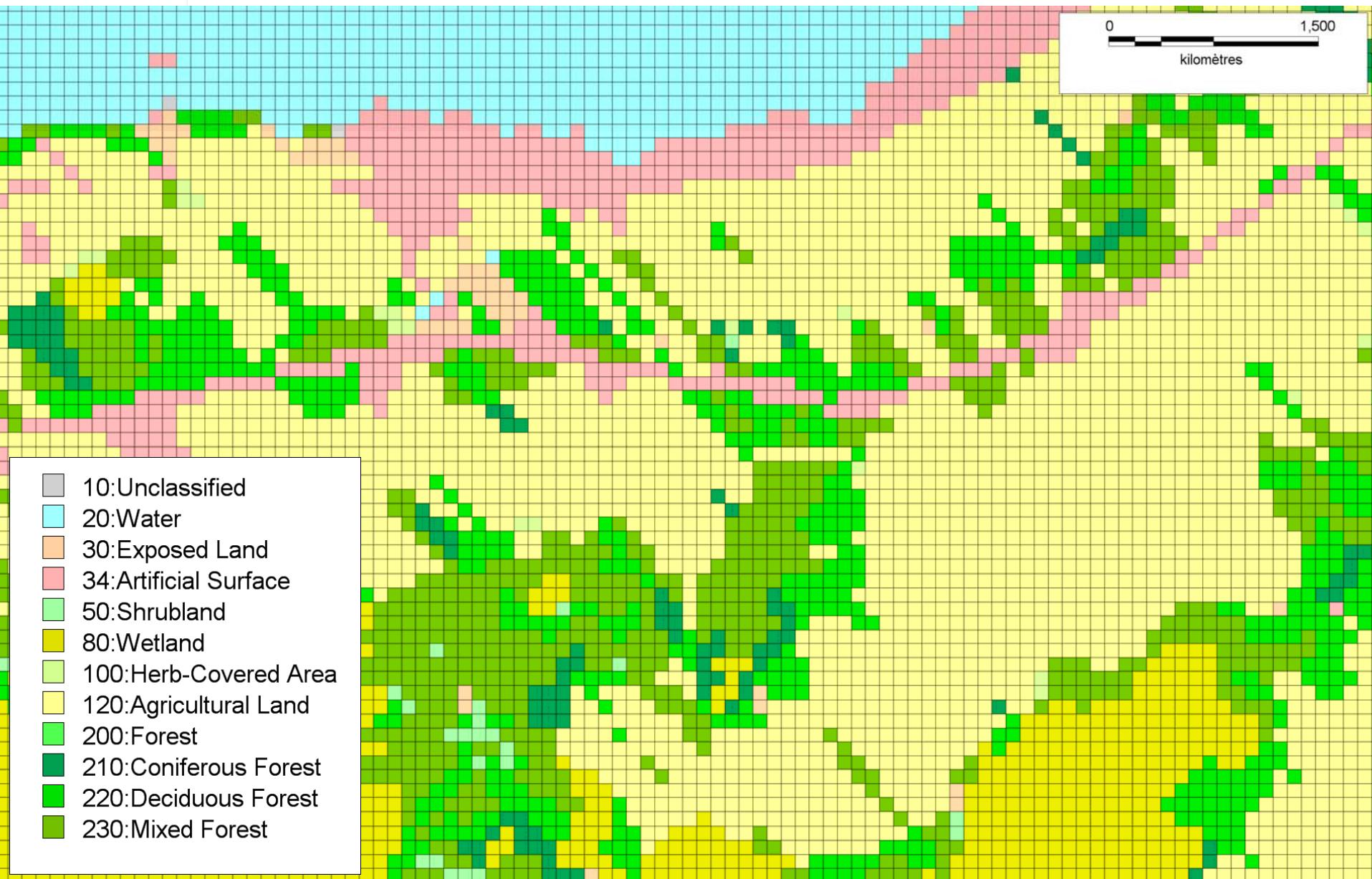


Land cover, part of the Chaudière-Appalaches region, circa 2006, 100 m grid





Land cover by 100 m unit, part of the Chaudière-Appalaches region, circa 2006





Comments on the results

- Preliminary measurements of the area by land cover type for both years and of the change in stock
- Size of the error term on the change in stock estimates?
 - Part of error term attributable to the differences between the data sets
- Alternatives:
 - Reduce the number of land cover classes and review the decisions taken to integrate the data
 - Use other data and accept a lower precision



Conclusion

- Feasible to create land accounts for Québec using existing data
 - Test of a methodology for creating land accounts based on a variety of data
- Statistical infrastructure for Québec land accounts
 - Some discrepancies between the land cover classification proposed for Québec and the SEEA's classification
 - Grids system in accordance with the methodology proposed for the SEEA Experimental Ecosystem Accounts
 - Flexibility in calculating results
- Next steps
 - Land accounts for the whole of Québec and for a more recent reference year (2011)
 - Extension into ecosystem accounts – Northern Québec Biodiversity Atlas (Atlas de la biodiversité du Québec nordique, MDDEP)