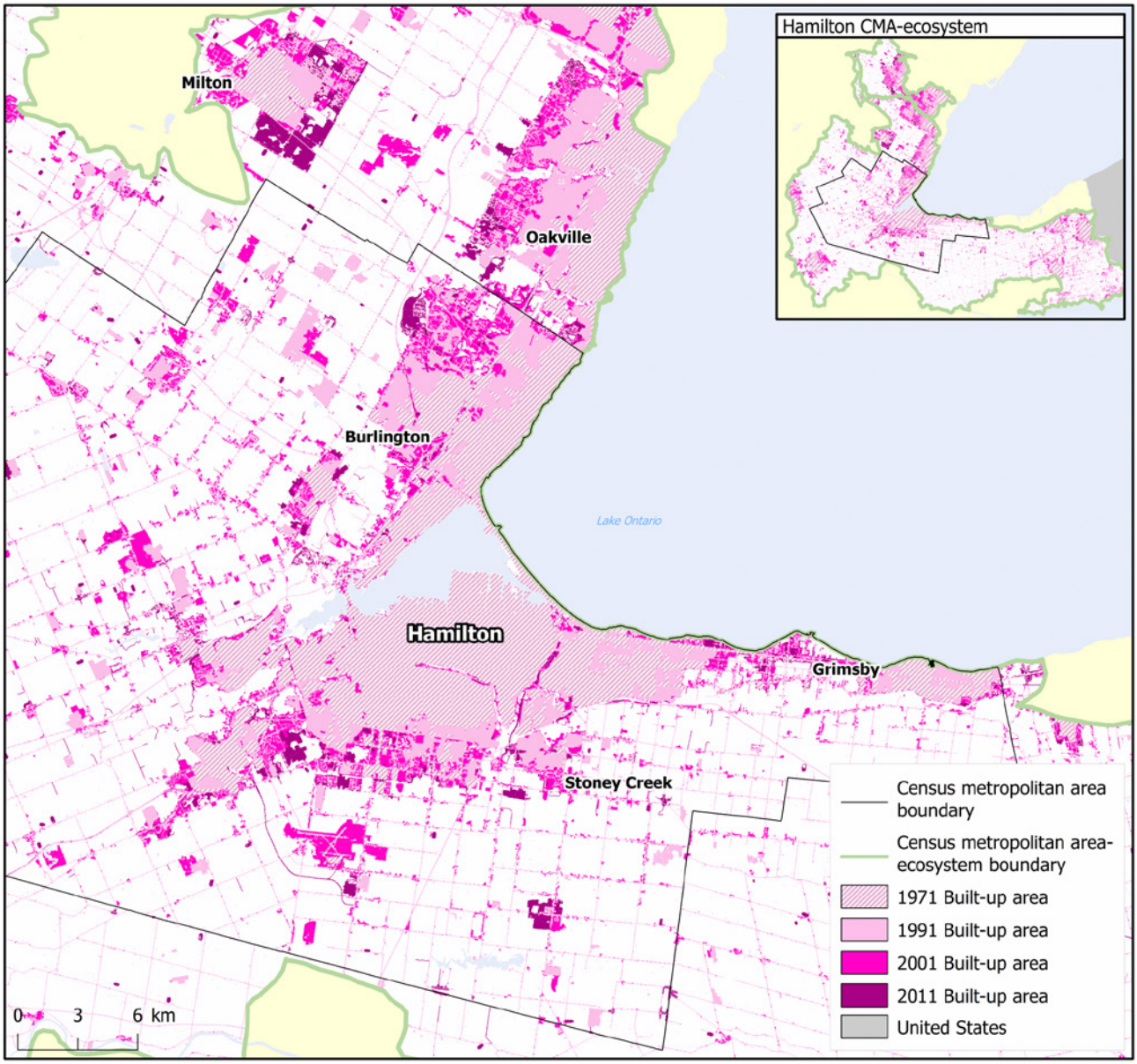
Hamilton, Ontario

Highlights

- At the CMA level, built-up area increased from 187 km^2 in 1971 to 420 km^2 in 2011, an increase of 124%.
- At the CMA-E level, built-up area increased from 512 km^2 in 1971 to 1,389 km^2 in 2011, an increase of 172%.
- In 2011, the natural and semi-natural land class was divided into forest (49%), water (5%) and other (46%).
- From 1971 to 2011, 487 km^2 of arable land and 191 km^2 of natural and semi-natural land were lost to settled area.
- Of the natural and semi-natural land converted to settled area from 1971 to 2011, 35.9% was forest, 55.9% was natural land for pasture and 8.2% was classed as other.
- Population in the CMA increased by 43% from 503,189 to 721,053 between 1971 and 2011.
- The number of dwellings in the CMA increased by 99% from 147,550 to 294,150 between 1971 and 2011.

Map 3.9

Built-up area, Hamilton census metropolitan area (CMA) and census metropolitan area-ecosystem (CMA-E), 1971, 1991, 2001 and 2011

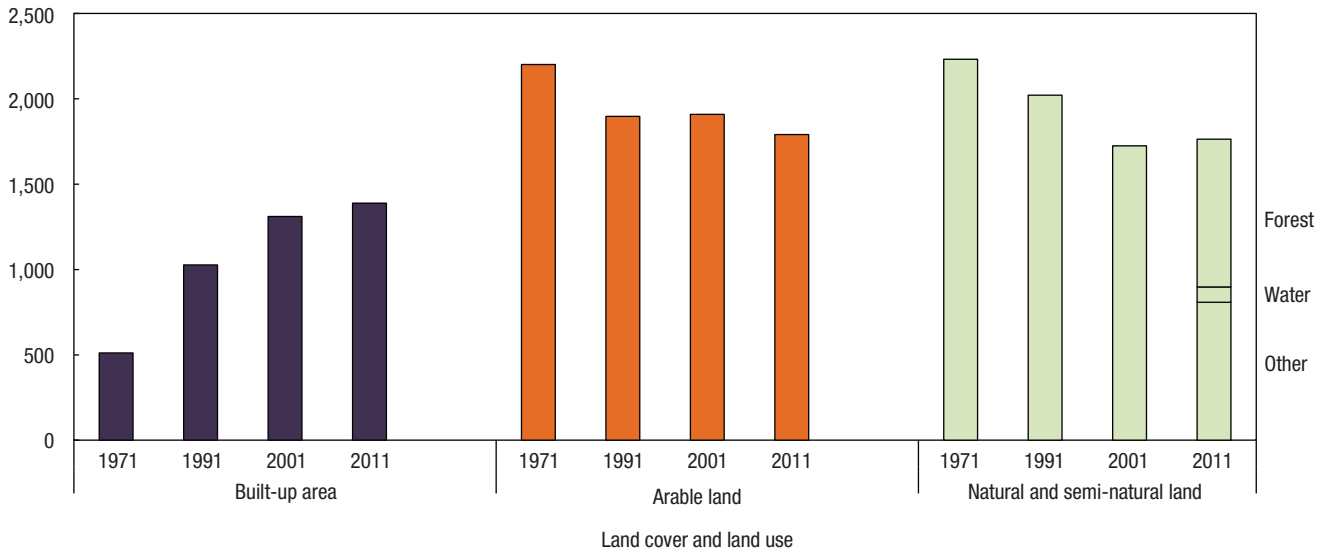


Note: Sources for 1971 built-up area do not contain the same level of detail as the more recent years.

Sources: Statistics Canada, Environment, Energy and Transportation Statistics Division, 2016, special tabulation of data from Natural Resources Canada (NRCan), Canada Centre for Remote Sensing (CCRS), 1999, *Canada Land Inventory: CLI Land Use (circa 1966),* ftp://ftp2.cits.rncan.gc.ca/pub/geott/cli_250k/landuse/ (accessed September 15, 2015); NRCan, CCRS, 1999, *Canada Land Use Monitoring Program (CLUMP): Land Use (1971),* ftp://ftp2.cits.rncan.gc.ca/pub/geott/clump/clump_1971/ (accessed September 15, 2015); Agriculture and Agri-Food Canada, 2015, *Land Use 1990, 2000 and 2010,* http://open.canada.ca/data/en/dataset/18e3ef1a-497c-40c6-8326-aac1a34a0dec (accessed September 16, 2015); NRCan, Canada Centre for Mapping and Earth Observation, 2014, *CanVec+* , ftp://ftp2.cits.rncan.gc.ca/pub/canvec+/shp/ (accessed August 10, 2015); United States Census Bureau, 2014, *Digital cartographic file in shapefile format – States*, file: cb_2014_us_state_500k.zip, http://www.census.gov/geo/maps-data/data/cbf/cbf_state.html (accessed October 29, 2015).

Chart 3.17
Land cover and land use, Hamilton census metropolitan area-ecosystem (CMA-E), 1971, 1991, 2001 and 2011

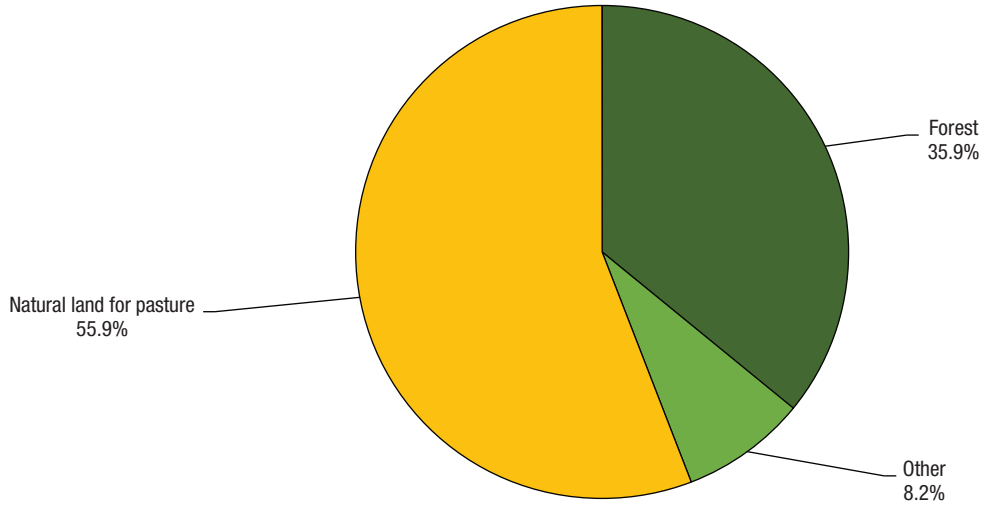
square kilometres



Notes: CMA-E are not spatially mutually exclusive—they overlap where a Soil Landscape of Canada (SLC) polygon crosses more than one CMA boundary, as is the case in Toronto and surrounding CMAs including Hamilton, Oshawa, Kitchener–Cambridge–Waterloo, Guelph, Brantford and Barrie. Caution should be used when comparing data. See CMA-E maps in Section 3: Ecosystem accounts and statistics by census metropolitan area for a visual representation of the CMA-E boundaries. Built-up area for 1971 is based on *Canada Land Inventory: Land Use* (CLI: LU) and *Canada Land Use Monitoring Program* (CLUMP), with modeling of roads. CLI: LU and CLUMP built-up areas that were not built-up in the AAFC *Land Use, 1990* dataset were removed from the 1971 built-up data and reclassified according to their 1990 cover. Built-up areas for other years are taken from *Land Use, 1990, 2000 and 2010*. Arable land is composed of the cropland, tame or seeded pasture and summerfallow land from the Interpolated Census of Agriculture. Natural and semi-natural land is the residual area remaining after subtracting built-up and arable land from the total area. Because it was calculated residually, the class also includes some homes and other buildings, particularly those located on large lots and in rural areas, since these may not be captured by satellite imagery as built-up, due in part to the resolution of the data, but also overlying tree canopy. For 2011, forest and water are broken out separately based on data from *AAFC Crop Inventory, 2011* and *CanVec+* respectively. Other natural and semi-natural land is a residual class calculated by subtracting all other classes from the total area.

Sources: Statistics Canada, Environment, Energy and Transportation Statistics Division, 2016, special tabulation of data from Natural Resources Canada (NRCan), Canada Centre for Remote Sensing (CCRS), 1999, *Canada Land Inventory: CLI Land Use (circa 1966)*, ftp://ftp2.cits.rncan.gc.ca/pub/geott/cli_250k/landuse/ (accessed September 15, 2015); NRCan, CCRS, 1999, *Canada Land Use Monitoring Program (CLUMP): CLUMP Land Use (1971)*, ftp://ftp2.cits.rncan.gc.ca/pub/geott/clump/clump_1971/ (accessed September 15, 2015); Agriculture and Agri-Food Canada (AAFC), 2015, *Land Use 1990, 2000 and 2010*, http://open.canada.ca/data/en/dataset/18e3ef1a-497c-40c6-8326-aac1a34a0dec (accessed September 16, 2015); AAFC and Statistics Canada, special tabulation, *Census of Agriculture*, Census Geographic Component Base 2011 and Census of Agriculture Regular Base 1971; AAFC, 2013, *AAFC Crop Inventory, 2011*, http://open.canada.ca/data/en/dataset/58ca7629-4f6d-465a-88eb-ad7fd3a847e3 (accessed August 10, 2015); NRCan, Canada Centre for Mapping and Earth Observation, 2014, *CanVec+*, ftp://ftp2.cits.rncan.gc.ca/pub/canvec+/shp/ (accessed August 10, 2015).

Chart 3.18
Natural and semi-natural land lost to settled area, by selected land class, Hamilton census metropolitan area-ecosystem (CMA-E), 1971 to 2011



Notes: Natural and semi-natural land lost to settled area is calculated by overlaying the growth in settled area from 1971 to 2011 on natural and semi-natural land from the *Canada Land Inventory: Land Use (CLI: LU)* base layer and, for areas where the 1971 settled area was trimmed, on the area reclassified using AAFC's *Land Use, 1990*. Natural and semi-natural land lost to roads is not included. Other could include rock and unvegetated surfaces; wetland; mines, quarries, sand and gravel pits; outdoor recreation; other natural and semi-natural land and unmapped areas.
Sources: Statistics Canada, Environment, Energy and Transportation Statistics Division, 2016, special tabulation of data from Natural Resources Canada (NRCan), Canada Centre for Remote Sensing (CCRS), 1999, *Canada Land Inventory: CLI Land Use (circa 1966)*, ftp://ftp2.cits.rncan.gc.ca/pub/geott/cli_250k/landuse/ (accessed September 15, 2015); NRCan, CCRS, 1999, *Canada Land Use Monitoring Program (CLUMP): CLUMP Land Use (1971)*, ftp://ftp2.cits.rncan.gc.ca/pub/geott/clump/clump_1971/ (accessed September 15, 2015); Agriculture and Agri-Food Canada, 2015, *Land Use 1990, 2000 and 2010*, http://open.canada.ca/data/en/dataset/18e3ef1a-497c-40c6-8326-aac1a34a0dec (accessed September 16, 2015).

Table 3.25
Population and dwellings, total and settled area, Hamilton census metropolitan area (CMA) and census metropolitan area-ecosystem (CMA-E), 1971, 1991, 2001 and 2011

	CMA[1]		CMA-ecosystem[2,3]	
	Total area	Settled area[4]	Total area	Settled area[4]
	number			
1971				
Population	503,189	474,600	1,041,889	958,892
Dwellings	147,550	140,156	299,404	277,914
1991				
Population	598,345	586,141	1,633,967	1,608,728
Dwellings	220,851	216,963	564,251	556,158
2001				
Population	659,005	646,300	1,976,870	1,942,949
Dwellings	259,206	254,813	712,851	701,349
2011				
Population	721,053	707,165	2,438,897	2,402,686
Dwellings	294,150	289,263	894,030	881,411
	percent			
Population and dwelling change, 1971 to 2011				
Population	43	49	134	151
Dwellings	99	106	199	217

1. 2011 census metropolitan area (CMA) boundaries are used for all years.
2. The CMA-Ecosystem (CMA-E) combines any Soil Landscapes of Canada (SLC) polygon that is contained within or that intersects with the CMA boundary, as well as SLC polygons that are fully contained within this newly formed boundary of the CMA-E.
3. CMA-E are not spatially mutually exclusive—they overlap where a Soil Landscape of Canada (SLC) polygon crosses more than one CMA boundary, as is the case in Toronto and surrounding CMAs including Hamilton, Oshawa, Kitchener–Cambridge–Waterloo, Guelph, Brantford and Barrie. Caution should be used when comparing data. See CMA-E maps in Section 3: Ecosystem accounts and statistics by census metropolitan area for a visual representation of the CMA-E boundaries.
4. Settled area is defined as the built-up area excluding roads. Settled area population and dwelling counts include 1971 and 1991 enumeration area points and 2001 and 2011 dissemination block points located within 400 m of the settled area. Population and dwelling data for 2001 and 2011 is finer in scale than data for 1971 and 1991 and can therefore be better attributed to the settled areas, which may limit comparability of the data over time.

Sources: Statistics Canada, Environment, Energy and Transportation Statistics Division, 2016, special tabulation of data from the 1971, 1991, 2001 and 2011 Censuses of Population; Natural Resources Canada (NRCan), Canada Centre for Remote Sensing (CCRS), 1999, *Canada Land Inventory: CLI Land Use (circa 1966)*, ftp://ftp2.cits.rncan.gc.ca/pub/geott/cli_250k/landuse/ (accessed September 15, 2015); NRCan, CCRS, 1999, *Canada Land Use Monitoring Program (CLUMP): CLUMP Land Use (1971)*, ftp://ftp2.cits.rncan.gc.ca/pub/geott/clump/clump_1971/ (accessed September 15, 2015); Agriculture and Agri-Food Canada, 2015, *Land Use 1990, 2000 and 2010*, http://open.canada.ca/data/en/dataset/18e3ef1a-497c-40c6-8326-aac1a34a0dec (accessed September 16, 2015).

Table 3.26
Land cover and land use, Hamilton census metropolitan area (CMA) and census metropolitan area-ecosystem (CMA-E), 1971, 1991, 2001 and 2011

	CMA[1]	CMA-ecosystem[2,3]	CMA as a proportion of CMA-ecosystem
	square kilometres		percent
Total land area	1,372	4,944	28
1971			
Total built-up[4]	187	512	37
Settled	125	332	38
Roads	62	179	35
Arable[5]	..	2,201	..
Natural and semi-natural[6]	..	2,232	..
1991			
Total built-up[7]	323	1,027	31
Settled	216	667	32
Roads	107	359	30
Arable[5]	..	1,897	..
Natural and semi-natural[6]	..	2,021	..
2001			
Total built-up[7]	397	1,310	30
Settled	288	947	30
Roads	109	363	30
Arable[5]	..	1,909	..
Natural and semi-natural[6]	..	1,725	..
2011			
Total built-up[7]	420	1,389	30
Settled	305	1,010	30
Roads	115	379	30
Arable[5]	..	1,791	..
Natural and semi-natural[8]	..	1,764	..
Forest	..	866	..
Water	..	91	..
Other	..	808	..
		percent	
Land cover and land use change, 1971 to 2011			
Total built-up area[4,7]	124	172	...
Arable[5]	...	-19	...
Natural and semi-natural[6]	...	-21	...

1. 2011 census metropolitan area (CMA) boundaries are used for all years. Total area excludes water.
2. The CMA-Ecosystem (CMA-E) combines any Soil Landscapes of Canada (SLC) polygon that is contained within or that intersects with the CMA boundary, as well as SLC polygons that are fully contained within this newly formed boundary of the CMA-E. Includes all terrestrial and water surfaces.
3. CMA-E are not spatially mutually exclusive—they overlap where a Soil Landscape of Canada (SLC) polygon crosses more than one CMA boundary, as is the case in Toronto and surrounding CMAs including Hamilton, Oshawa, Kitchener–Cambridge–Waterloo, Guelph, Brantford and Barrie. Caution should be used when comparing data. See CMA-E maps in Section 3: Ecosystem accounts and statistics by census metropolitan area for a visual representation of the CMA-E boundaries.
4. Built-up area for 1971 is based on *Canada Land Inventory Land Use* (CLI: LU) and *Canada Land Use Monitoring Program* (CLUMP), code B – Urban Built-up. CLI: LU and CLUMP built-up areas that were not built-up in the AAFC *Land Use, 1990* dataset were removed from the 1971 built-up data and reclassified according to their 1990 cover. To improve comparability with the other years, roads included in the core built-up area were identified and removed to produce the 1971 settled area. The 1971 dataset did not include roads outside the core built-up area. Roads were modeled by applying the ratio of roads to settled area from 1990 to the 1971 settled area.
5. Arable land area is composed of the cropland, tame or seeded pasture and summerfallow land from the Interpolated Census of Agriculture.
6. Natural and semi-natural land is the residual area remaining after subtracting built-up and arable land from the total area. Because it was calculated residually, the class also includes some homes and other buildings, particularly those located on large lots and in rural areas, since these may not be captured by satellite imagery as built-up, due in part to the resolution of the data and overlying tree canopy.
7. Built-up area estimates for 1991, 2001 and 2011 are based on *Land Use, 1990, 2000 and 2010,* codes 21 (Settlement–Built-up and urban) and 25 (Roads–primary, secondary and tertiary).
8. For 2011, forest and water are broken out separately based on data from *AAFC Crop Inventory, 2011* and *CanVec+* respectively. Other natural and semi-natural land is a residual class calculated by subtracting all other classes from the total area. The change over time for these categories requires further validation.

Sources: Statistics Canada, Environment, Energy and Transportation Statistics Division, 2016, special tabulation of data from Natural Resources Canada (NRCan), Canada Centre for Remote Sensing (CCRS), 1999, *Canada Land Inventory: CLI Land Use (circa 1966)*, ftp://ftp2.cits.rncan.gc.ca/pub/geott/cli_250k/landuse/ (accessed September 15, 2015); NRCan, CCRS, 1999, *Canada Land Use Monitoring Program (CLUMP): CLUMP Land Use (1971)*, ftp://ftp2.cits.rncan.gc.ca/pub/geott/clump/clump_1971/ (accessed September 15, 2015); Agriculture and Agri-Food Canada (AAFC), 2015, *Land Use 1990, 2000 and 2010*, http://open.canada.ca/data/en/dataset/18e3ef1a-497c-40c6-8326-aac1a34a0dec (accessed September 16, 2015); AAFC and Statistics Canada, special tabulation, *Census of Agriculture*, Census Geographic Component Base 2011 and 2001 and *Census of Agriculture*, Regular Base 1991 and 1971; AAFC, 2013, *AAFC Crop Inventory, 2011*, http://open.canada.ca/data/en/dataset/58ca7629-4f6d-465a-88eb-ad7fd3a847e3 (accessed August 10, 2015); NRCan, Canada Centre for Mapping and Earth Observation, 2014, *CanVec+*, ftp://ftp2.cits.rncan.gc.ca/pub/canvec+/shp/ (accessed August 10, 2015).

Table 3.27
Ecosystem asset account, Hamilton census metropolitan area-ecosystem (CMA-E), 1971 to 2011

	Total built-up area[1]			
	Settled	Roads	Arable[2]	Natural and semi-natural[3]
	square kilometres			
Opening stock 1971	332	179	2,201	2,232
Land lost to settled area	…	…	-487	-191
Balance of change[4]	678	200	78	-277
Closing stock 2011	1,010	379	1,791	1,764

1. Built-up area data are taken from multiple sources. The 1971 built-up area is based on *Canada Land Inventory: Land Use* (CLI: LU) and *Canada Land Use Monitoring Program* (CLUMP). CLI: LU and CLUMP built-up areas that were not built-up in the AAFC *Land Use, 1990* dataset were removed from the 1971 built-up data and reclassified according to their 1990 cover. To improve comparability with the other years, roads included in the 1971 core built-up area were identified and removed to produce the 1971 settled area. As the 1971 dataset did not include roads outside the core built-up area, roads were modeled by applying the ratio of roads to settled area from 1990 to the 1971 settled area. Built-up area estimates for 2011 are based on *Land Use, 1990, 2000 and 2010,* codes 21 (Settlement–Built-up and urban) and 25 (Roads–primary, secondary and tertiary).
2. Arable land lost to settled area is calculated by overlaying the growth in settled areas from 1971 to 2011 on the CLI: LU base layer and, for areas where the 1971 settled area was trimmed, on the area reclassified using AAFC *Land Use, 1990*. The following CLI: LU classes were included: cropland, improved pasture and forage crops, orchards and vineyards and horticulture.
3. Natural and semi-natural land lost to settled area is calculated by overlaying the growth in settled area from 1971 to 2011 on the CLI: LU base layer and, for areas where the 1971 settled area was trimmed, on the area reclassified using AAFC *Land Use, 1990*. The following CLI: LU classes were included: forest, natural pasture and rangeland, outdoor recreation areas, rock and unvegetated surfaces, open wetland and unmapped areas.
4. The balance of change row reports the change, other than arable and natural and semi-natural land lost to settled area, that occurred from 1971 to 2011. These values are determined using an accounting procedure and represent the remaining difference between the opening and closing stock. Some rounding may occur.

Note: CMA-E are not spatially mutually exclusive—they overlap where a Soil Landscape of Canada (SLC) polygon crosses more than one CMA boundary, as is the case in Toronto and surrounding CMAs including Hamilton, Oshawa, Kitchener–Cambridge–Waterloo, Guelph, Brantford and Barrie. Caution should be used when comparing data. See CMA-E maps in Section 3: Ecosystem accounts and statistics by census metropolitan area for a visual representation of the CMA-E boundaries.

Sources: Statistics Canada, Environment, Energy and Transportation Statistics Division, 2016, special tabulation of data from Natural Resources Canada (NRCan), Canada Centre for Remote Sensing (CCRS), 1999, *Canada Land Inventory: CLI Land Use (circa 1966)*, ftp://ftp2.cits.rncan.gc.ca/pub/geott/cli_250k/landuse/ (accessed September 15, 2015); NRCan, CCRS, 1999, *Canada Land Use Monitoring Program (CLUMP): CLUMP Land Use (1971),* ftp://ftp2.cits.rncan.gc.ca/pub/geott/clump/clump_1971/ (accessed September 15, 2015); Agriculture and Agri-Food Canada (AAFC), 2015, *Land Use 1990, 2000 and 2010*, http://open.canada.ca/data/en/dataset/18e3ef1a-497c-40c6-8326-aac1a34a0dec (accessed September 16, 2015); AAFC and Statistics Canada, special tabulation, *Census of Agriculture*, Census Geographic Component Base 2011 and 2001 and *Census of Agriculture*, Regular Base 1971 and 1991; NRCan, Canada Centre for Mapping and Earth Observation, 2014, *CanVec+,* ftp://ftp2.cits.rncan.gc.ca/pub/canvec+/shp/ (accessed August 10, 2015).

Links to more information

Tables by metropolitan area, Hamilton
www.StatCan.gc.ca/tables-tableaux/sum-som/l01/met01/met109-eng.htm

Hamilton CMA, population change, 2006 to 2011, by 2011 census tract
www12.StatCan.gc.ca/census-recensement/2011/geo/map-carte/pdf/thematic/2011-98310-001-537-013-01-00-eng.pdf

Metropolitan gross domestic product, experimental estimates, CANSIM TABLE 381-5000
www5.StatCan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=3815000&paSer=&pattern=&stByVal=1&p1=1&p2=31&tabMode=dataTable&csid

Hamilton CMA, Census Profile, 2011
www12.StatCan.gc.ca/census-recensement/2011/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CMA&Code1=537&Geo2=PR&Code2=35&Data=Count&SearchText=hamilton&SearchType=Begins&SearchPR=01&B1=All&Custom=&TABID=1

Hamilton CMA, National Household Survey (NHS) Profile, 2011
www12.StatCan.gc.ca/nhs-enm/2011/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CMA&Code1=537&Data=Count&SearchText=hamilton&SearchType=Begins&SearchPR=01&A1=All&B1=All&Custom=&TABID=1