

Low back merger encroaching at a stable dialect boundary in northern New York

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Dialect regions of **Upstate New York** (Dinkin 2009, 2011, 2013) include:

- Inland North (central and western NY): characterized by Northern Cities Shift
- North Country (northeast corner of NY): advanced LOT/THOUGHT merger; no NCS LOT/THOUGHT merger mostly absent in Inland North; but strongest incipient evidence for it is at **northern edge** of Inland North, near Canada and North Country (Dinkin 2011).

Boundary between Inland North & North Country is in **St. Lawrence County**—sparsely-populated rural region (16/km²), across St. Lawrence River from E Ontario—sharply separating communities of **Ogdensburg & Canton**.

Research questions in this paper:

1. Is merger in northern NY **due to proximity of Canada**?
 - Nearest large cities are in Canada—likeliest source of diffusion?
 - But Boberg (2000) argues sound change doesn't diffuse across the border.
2. **Why is there a dialect boundary** between Ogdensburg and Canton?
 - Boundary is quite sharp—no other populated places between the two
 - No clear evidence for different settlement sources (cf. Dinkin 2013).
 - They differ in several economic & geographic features:

Ogdensburg	Canton
city	village
on the river, with border crossing	20 miles from the river
low population born outside NY	high population born outside NY
low middle-class population	high middle-class population
two prisons	two universities
further west	further east

This study: broader examination of St. Lawrence region—

4 communities **along St. Lawrence River**, 4 about 25 miles south of it (see map).

28 interviews conducted 2007–8 (Dinkin 2009, 2011, 2013):

Canton (9), Ogdensburg (9), Watertown (10)

24 new interviews conducted in 2014 using the same methodology:

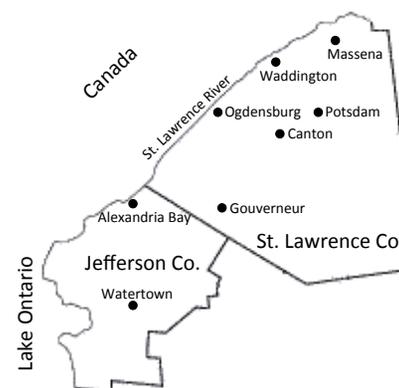
Alexandria Bay (4), Gouverneur (5), Massena (4), Potsdam (6), Waddington (5)

...plus 5 more in Alexandria Bay in 2017.

New interviews' normalized formant measurements extracted with FAVE (Rosenfelder et al. 2011);

old interviews' vowel measurements were renormalized for comparability.

One Alexandria Bay speaker's formants were not measurable due to too much background noise.



Jefferson and St. Lawrence Counties, showing communities sampled in this study : 8 communities with a variety of geographic, economic, & demographic similarities & differences.

Significant **differences between towns** and **apparent-time change toward merger** were found in linear-regression models of multiple indices of LOT/THOUGHT merger.

Minimal-pair judgments:

each speaker¹ gave judgments on two minimal pairs (usually *cot-caught*, *don-dawn*); each speaker is assigned score from 0 (both pairs merged) to 4 (both pairs distinct).

Linear regression model of judgment score vs. town, year of birth, gender, and education predicts these scores² by town:

Alex Bay: 3.80	Ogdensburg: 3.63	Waddington: 2.03	Massena: 1.25
Watertown: 3.61	Gouverneur: 3.40	Canton: 1.33	Potsdam: 1.16

Sharp difference **between eastern & western halves** of data: more merged on east side.

Apparent-time trend toward merger in judgments ≈ -0.43 per decade

Adjusted Euclidean distance (Nycz & Hall-Lew 2014) estimates F1/F2 distance between speakers' central phonetic targets of LOT and THOUGHT phonemes.

Linear regression of speakers' ED-Adjusted vs. town, year of birth, gender, and education predicts these distances by town:

Alex Bay: 166	Ogdensburg: 282	Waddington: 155	Massena: 168
Watertown: 311	Gouverneur: 261	Canton: 130	Potsdam: 164

Still mostly an east-west difference, but **Alex Bay patterns with eastern half**;

LOT/THOUGHT substantially closer there than other towns with non-merged judgments.

Apparent-time trend toward shrinking Euclidean distance ≈ -28 Hz per decade

¹ One speaker in Waddington ended the interview without completing elicitation tasks.

² All modeled results shown by town set year of birth = 1973, the median age of the sample.

Bhattacharyya's affinity (cf. Strelluf 2016, Johnson 2015):

measures **degree of overlap** between phonetic distributions of two phonemes, ranges from 0 (completely separate) to 1 (total overlap).

Model of speakers' Bhattacharyya affinity of LOT/THOUGHT phonemes (excluding pre-/l, r/) vs. town, year of birth, gender, education predicts these values by town:

Alex Bay: .587	Ogdensburg: .382	Waddington: .668	Massena: .722
Watertown: .292	Gouverneur: .383	Canton: .696	Potsdam: .710

Alexandria Bay still patterns with the eastern half as more merged.

Apparent-time trend toward increasing overlap $\approx +.04$ per decade

Results so far:

- **Sharp boundary** between more merged east half, unmerged west half
- Merger **progressing in apparent time** throughout the region
- Alexandria Bay patterns as unmerged in judgments but more merged in production
- Proximity to Canadian border does not appear to play much role in degree of merger

Watertown & Ogdensburg maintain distinction by having **LOT fronter** than other towns, but Gouverneur maintains it **without much fronting** of LOT:

Alex Bay: 1501	Ogdensburg: 1595	Waddington: 1455	Massena: 1450
Watertown: 1599	Gouverneur: 1507	Canton: 1487	Potsdam: 1416

Mixed-effects linear regression of LOT F2 vs. town, year of birth, gender, education, style, onset, coda³; speaker and word as random effects.

Gouverneur instead appears to have higher/backer THOUGHT than other towns:

Alex Bay: 2890	Ogdensburg: 2927	Waddington: 2908	Massena: 2936
Watertown: 2858	Gouverneur: 2733	Canton: 2980	Potsdam: 2790

Mixed-effects linear regression of back diagonal index (F2+2F1) of THOUGHT, as above.

Why the difference between Gouverneur vs. Ogdensburg/Watertown?

LOT-fronting and THOUGHT-lowering are **part of Northern Cities Shift**.

Compare another indicator of NCS, **raising and fronting of TRAP**:

much less present in Gouverneur than Ogdensburg, Watertown, or even Alex Bay.

Alex Bay: 361	Ogdensburg: 553	Waddington: 202	Massena: 248
Watertown: 544	Gouverneur: 296	Canton: 208	Potsdam: 186

Mixed-effects linear regression of front diagonal index (F2-2F1) of TRAP, as above but also excluding prenasal tokens.

- Watertown & Ogdensburg: low back distinction **with NCS**
- Gouverneur: low back distinction but **substantially less evidence of NCS**
- Alex Bay: low back distinction in judgments only; intermediate NCS in TRAP
- eastern half of sample: low back merger, no NCS

Massena & Ogdensburg are economically & demographically very similar; difference between them hard to attribute to anything but **east-west position**.

Is low back merger in northern NY due to proximity of Canada?

Towns closer to Canada aren't consistently associated with more (or less!) merger. Alex Bay may be an exception, but merger there has a different character than the eastern half.

Why is there a dialect boundary between east and west portions of the region?

NCS is present in Watertown, Alex Bay, Ogdensburg, but not elsewhere. Why there?

In 19th C., Ogdensburg was the **easternmost limit of shipping** from Lake Ontario:

"Ogdensburg is considered as being at the foot of the lake, because there is little descent in the river to this place, below which the rapids commence, and the river navigation ends." (Hayward 1854:504; cf. also Willoughby 1960:1)

So the dialect boundary represents a break in historical patterns of transport/commerce—no longer relevant to today's transportation, but still reflected in dialectology.

Why does Gouverneur lack NCS while Watertown and Ogdensburg data have it?—

possible result of **real-time change**? Did it **originally** have NCS, but lose it?

Thiel & Dinkin (2017) find Ogdensburg has **mostly lost NCS** since 2008;

Maybe Gouverneur is the same, and 2014 data postdates loss of NCS there?

Why does Alexandria Bay have low back merger in production?

Tiny tourist town (population ≈ 1000) with a relatively mobile population:

perhaps dialect contact introduces approximation of LOT/THOUGHT?

—not necessarily due to border specifically, but contact with other Americans?

Acknowledgements:

Thanks to my research assistants Niayesh Ilkhani and Shane Taylor, who transcribed most of the new interviews; Christopher Strelluf, for assistance implementing Bhattacharyya's affinity in R; and Anja Thiel, for many productive conversations on the dialectology and history of St. Lawrence County.

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³ Reference level: null onset, /t/ coda, spontaneous speech. Tokens preceding /l/, /r/ excluded.