Research by Eugene Hunn (1996) suggested that toponymic density and population density are roughly equal for a range of indigenous groups across North America. In Wemindji, Quebec, historic and current toponymic and population data support Hunn’s observation. I demonstrate that toponymic constraints are real by holding the number of traditional toponyms (898) as a background constant, and estimating the growth of Wemindji’s population from 1960 to 2010 based on knowledge held by local experts. Measurements from historic air photographs assumed toponymic growth proportional to the area within the limits of Wemindji town development. A set of 78 new town place names provide a baseline for that measurement. Relative to toponymic density, population density steadily increased from 1960 to 2010, with a graph depicting the two densities suggesting equality in approximately 1995.

Keywords: placenames, James Bay, toponymy, ethnoecology, indigenous mapping

Introduction

This article is part of a debate that goes back to Hunn (1994) and Kelly (1994). Hunn examined the idea of a “magic number” of place names (500) an individual may know, while Kelly, in a response to Hunn, critically examined studies claiming 500 as a magic number—or the maximum population a given landscape, constrained by climatic or other factors, may accommodate. Hunn provided evidence for the real existence of a magic number (in his paper he looked specifically at toponyms), while Kelly provided evidence against, citing earlier studies in anthropology that had used single-variable environmental factors to make claims about population density constraints. It was precisely these oversimplified and methodologically flawed earlier studies upon which Hunn based his own observations and claims; this fact, according to Kelly, significantly weakened the former’s claims (Kelly, 1994, 437).

Hunn (1996) also provided evidence for collective toponymic constraints with his graph showing equality between toponymic density (number of toponyms, or place names, per unit area) and
population density (number of individuals per unit area) across widely dispersed North American indigenous groups. Hunn speculated that the constraining factor ultimately stems from individual limitations in human cognitive (semantic) space. The evidence presented in this article provides support for both individual and collective toponymic constraints in Wemindji.

Scientific exploration of toponymic constraints necessarily bridges knowledge from an array of academic disciplines, including anthropology, ecology, geography, and cognitive science. A broad background of theoretical knowledge driven by unresolved debates or suggestions by Hunn (1994, 1996) drives exploration of the following two questions: Do constraints affect the number or density of toponyms or populations within a given (bounded) region? What, if any, factors (i.e., area, population density, cognitive limitations) limit growth in the number of toponyms within that region? These questions are motivated by research into the transmission of intergenerational indigenous knowledge about place in Wemindji, Quebec (Eades 2010); by unresolved aspects of the debate described at the beginning of this article; and by the recent re-appearance of magic numbers in toponymy and ethnoecology (Hunn and Meilleur 2010).

During two stays in Wemindji (see Figure 1), in the summer of 2008 and the winter of 2010, I introduced my topic—preservation and transmission of intergenerational knowledge and heritage—to key informants. At the same time, I incorporated myself into everyday life in Wemindji. Community members identified local demand for discussions about place names as indicated by local initiatives such as cultural heritage week, which includes a yearly commemorative journey and return to the original site of a traditional settlement where ancestors of present day Wemindji residents lived, 40 kilometres south of the present Wemindji site. My placement in Wemindji had been made in conjunction with a multi-disciplinary team of McGill and Concordia University researchers led by Colin Scott, whose work and ties to the community extend through three decades. Mapping place names in Wemindji was identified as an essential part of the Paakum-shumwaa-Maatuskau Protected Area Plan, a Social Sciences and Humanities Research Council funded project, the details of which our team was tasked with providing. From the start this plan was identified by Cree elders and community leaders as essential to local sustainability in the face of large-scale mining and hydroelectric activity in eastern James Bay, to which Wemindji has remained relatively unexposed, compared to other eastern James Bay communities (see Wilson 2008).

Advancement of traditional values is at the forefront of concern as the village experiences rapid change, both demographically and culturally, especially over the last 50 years (as described in the case study below). During my stay I was confronted by a clash of traditional and modern (see Eades 2012) values and these, in turn, were reflected by changing toponymic structures. Where I had not thought much about ‘magic numbers’ or toponymic densities before, I began to see the applicability of these terms in an attempt to tease out the meanings of toponymic change as indicator, or proxy measure, of greater changes in eastern James Bay.

Theoretical framework

With regard to the number 500, there seems to be confusion between what I call the “placed individual” and the “individual place.” Toponymic density refers to a collection of places rather than a specific named place in which individuals are placed. Place names refer to individual (named) places. An abstract concept of place as a category is not something we can imagine (or draw) unless an actual place (i.e., not an abstract category) is specified by the use of a name for a place. Only through the use of a name is a concrete place (as opposed to the abstract category of place) evoked (Basso 1996; Thornton 2008; Johnson 2010; Johnson and Hunn 2010).

Place names are tools for the evocation of specific places that in turn serve specific needs (e.g., the location of material or spiritual resources necessary for survival). Toponymic density, on the other hand, evokes an image of labelled data points on maps or geographic information systems. Toponymic density as a constraint does not make sense at the level of the individual. The latter is constrained by two things: his or her ability to move on the land and interact with (named) places; and semantic space in the brain (Hunn 1994, 1996) available for storing information (including names) about places. Hunn’s 1996 paper and his subsequent ethnoecological work go well beyond narrow focus upon quantity or correlations in place naming, forging new conceptualizations of folk–biological and ecological classification (see
Figure 1
Wemindji

Legend
- Named Places
- Inset Area
- Traplines

Projection/Datum: UTM Zone 17, NAD 83  Cartographer: Gwilym Eades  Date: January 15, 2013
Johnson and Hunn 2010). Likewise, researchers working with Inuit elders have, through the production of gazetteers and academic works, demonstrated and delineated precise senses of boundary as defined not only by both toponymic extent and density in indigenous lifeworlds, lands, and developments—but also by ways in which toponyms are used daily for life-sustaining activity (Muller-Wille 1987, 2001; Collignon and Muller-Wille 2006).

Collective/individual aspects of toponymy are reflected in scales of toponymic clustering. Modern individualized life (cf. Morantz 2002) in Wemindji is reflected in a very close, dense patterning of toponyms. Individual homes are not, for instance, considered to be named places because they are private spaces. Collective traditional life is reflected in a dispersed regional pattern of toponyms named in accordance with ancestral respect for spiritual and material presences on the land (Basso 1996; Thornton 2008). Modern named places, on the other hand, include public spaces such as malls, businesses, arenas, roads, and other town sites. Commonality between town and traditional named places lies in the collective and resource-focused nature of both. Table 1 gives a representative sample of both land- and town-based toponyms and their meanings.

It is the collective, functional nature of toponyms that lends them to performance as replicable linked sets, as in the case of the commemoratory return to the traditional settlement in Old Factory Bay, transmittable between generations of Cree individuals (Eades 2010). "Functional" in this context means place names have functions beyond tagging, much like a knife serves functions beyond cutting vegetables. Using this analogy of functionality, the knife could also be used as a screwdriver, and likewise there are other uses for place names. Place names serve as points of condensation around which stories are told about the land, and when those stories are told by elders in the presence of youth, intergenerational knowledge transmission is facilitated at the same time.

There is a separation between the mind that holds the name and the place to which it refers. For the Cree on the land, the place name will be meaningful to the extent that it has been performed (i.e., the place to which the name refers has been seen firsthand and interacted with); as such there is a subjective aspect to place consciousness and indeed to the quality of what it means to be conscious in general (cf. Edelman 1992, 2006). This qualitative aspect of place is relevant to larger connections extending beyond the numeric analysis undertaken below, and provides a link between the latter, detailed analysis and a broader literature on categorization, the mind, and spatial cognition (Lakoff and Johnson 1999; Levinson 2003; Mark et al., 2010; Johnson 2010), not to mention geographies of place (cf. Cresswell 2004) and political or power-laden aspects of place naming practices (cf. Vuolteenaho and Berg 2009).

For the Cree on the land, the experience of what it is like to "be there" is evoked by the name of the place referred to, but only if the experiencing individual (i.e., a Cree individual) has actually been there (i.e., at that place on the land) (cf. Basso 1996; Wood 2010; Johnson 2010). As a magic number, 500 makes sense within a paradigm of the functional mind, but it cannot be divorced from mindfully embodied activity. If, as I posit here, the area of collective action and embodied activity defines minds that combine toponyms into meaningful patterns of activity, then the

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Representative toponyms and their meanings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land-based:</strong></td>
<td><strong>Lakes and Rivers</strong></td>
</tr>
<tr>
<td>paakumshumwaa au siipii (Old Factory River)</td>
<td>mkumshumwaa au sakhkiikin (Old Factory Lake)</td>
</tr>
<tr>
<td><strong>Spiritual Place</strong></td>
<td><strong>Human (body or part)</strong></td>
</tr>
<tr>
<td>chipitukw (Ghost Dwelling)</td>
<td>utikinistikw siipii (Shoulder Blade River)</td>
</tr>
<tr>
<td><strong>Locational (proximity or topology)</strong></td>
<td>mitiswaa yaapistikw siipii (Umbilical Cord River)</td>
</tr>
<tr>
<td>aapiistikw (parallel beside lake)</td>
<td><strong>Local/actual</strong></td>
</tr>
<tr>
<td>mantaasookw (junction of rivers)</td>
<td>muktiki (junction of rivers)</td>
</tr>
<tr>
<td><strong>Historical/mythical</strong></td>
<td><strong>Land-based:</strong></td>
</tr>
<tr>
<td>sekaapaayasu su saakihiikin (named after an old man who had only one good leg and travelled by sitting on a toboggan and pushing with his good leg and one arm)</td>
<td><strong>Transportation</strong></td>
</tr>
<tr>
<td><strong>Business</strong></td>
<td><strong>Georgekish Road (Wemindji chief, reigning from 1933–1958)</strong></td>
</tr>
<tr>
<td>Sibi Gas (Sibi refers to river)</td>
<td><strong>Indooh Road (‘he is hunting’)</strong></td>
</tr>
<tr>
<td>Tawich Development Corporation (Tawich means the bay)</td>
<td><strong>Northern Store (food store)</strong></td>
</tr>
<tr>
<td>Maquatua Eeyou School (refers to both the Loon River and to the Cree people)</td>
<td><strong>Institutional</strong></td>
</tr>
</tbody>
</table>

**SOURCE:** (Eades, 2012)
number of toponyms is limited also by technologies that enable (or constrain) that activity upon the land. Both cognitive and embodied constraints define toponymic limits.

**Case Study**

Wemindji, one of twelve Cree communities in northern Quebec, Canada, is located on the eastern shore of James Bay which lies to the south of, and is joined to, the much larger Hudson Bay. This community, like others in the region, has seen a series of transformations. These include contact with Europeans, colonization, the building of fur-trade partnerships between the Cree and the Hudson Bay Company, Christianization, hydroelectric development, and struggles with provincial and federal governments for local control of traditional and economic activities on Cree hunting and trapping territories (Francis and Morantz 1983; Hornig 1999; Morantz 2002). Combined, these processes and events have produced a layer or apparatus of post–contact cultural materials, capabilities, and sensibilities thick enough to cause alarm about cultural obfuscation, loss, and assimilation, but not thick enough to erase intact traces of continuous Cree culture including, for our purposes here, place names.

Place naming on Wemindji Cree lands is not, in fact, a straightforward process of replacement of old names by new names, nor is the new cultural layer really a layer at all. Rather, I suggest it is more productive to see it as a web (cf. Albert and LeTourneau 2007). Place names, both old and new, connect to each other in very complex ways such that traditional and more recent spatial practices of movement for the purposes of securing livelihoods on and with the land become entangled. In the following study, conducted using data collected during the winter of 2010 in addition to an existing database, I untangle place names as locally produced and observed from 1960 to the present day.

In 1960, living in a traditional settlement, ancestors of the current residents of Wemindji moved approximately 40 kilometres to the north, from an island at the mouth of paakumshumwaaushikw siipii (Old Factory River), to a new location on higher ground at the mouth of mwaakatuu siipii (Loon River). Isostatic rebound, an uplifting of the land after the melting of continental glaciers, in part necessitated this move, as the depth of water around the island became too shallow for navigation. As this was a Hudson’s Bay Company post, such a situation was intolerable. Without intervention the local economy, dependent upon the fur trade (with shipping lanes along the James and Hudson Bay coasts), would have suffered. There was also in the traditional settlement a catholic (residential) school and it was felt that future generations would suffer alongside the economy should the residents stay at the Old Factory site.

After the move, a process of sedentarization was accelerated. Traditional life was slowly transformed into town life. While many families still spend a portion of the year on the land gathering traditional foods known to be present at places often named to indicate that presence, a good deal of food is now obtained locally in stores. In the winter of 2010 I gathered place names of two types: town– and land–based. This two–category system is not to be confused with an unproblematized traditional/ modern binary (cf. Eades 2012), but rather follows scaled realities of town– and land–based life. Most place names, town– and land–based alike, are associated with securing resources for subsistence in the form of food, shelter or other spiritual and material (including transportation) necessities. In this study, I examine numbers of place names plotted against time from 1960 to 2010, tracking the transition from more traditional lifestyles on the island to the south, to a more urban–inflected local life on higher ground to the north. I justify an extensive focus on quantities based on, and in light of, the observation above—that toponymic constraints are theorized as primarily collective in nature.

**Methodology**

Key informants (two local officials and members of prominent local families whose ancestors were part of the relocation of Wemindji) provided lists of families who made the original move from the southern to the northern (more recent) site, allowing for an estimation of the population of Wemindji in 1960 (assuming that about 50% of Wemindji lived permanently on the land at that time and that all permanent residents of the traditional village made the move to the north). That information, combined with Statistics Canada town profiles
local statistics (Cree Nation of Wemindji 2010), and aerial photographs (dated 1986, 2001, 2004 and 2008; obtained from the local band office, GIS department) allowed me to piece together a picture of movement from south to north, as well as movement from traditional to local lifestyles, using number of toponyms as a proxy measure of those movements (see Table 2 and Figure 2).

Assuming the developed area in the town of Wemindji proper to be proportional to the number of town toponyms, I directly measured the developed area of Wemindji at four points in time (see Figure 3). The area for 1960 was calculated based on the assumption, corroborated by the key informants, that the early Wemindji town site (i.e., by Loon River) consisted of what corresponds to the current downtown area only, including school, stores, band office, and a few businesses, totalling 12 named town places. The area of downtown, the layout of which has not fundamentally changed in 50 years, was measured on the latest (2008) photograph. Areal measurements at four points provided the profile showing growth in town-based place names. Town area is, however, for the most part irrelevant to calculations of both population and toponymic density, its relevance pertaining only to estimates of number of town place names. The only exception is the second population estimate in which an aerial photograph was used to provide an estimated population figure. The area used to calculate population and toponymic densities was the area of Wemindji territories as a whole (i.e., 30000 km²). This allows for direct comparison of densities longitudinally across the profile. Town place names were not included in toponymic density calculations, explaining the flatness of the toponymic density line. The number of town place names was considered too small to have a meaningful effect on results, with the number of town place names ranging between 1 and 9% of the total. As discussed below, however, the significance of town place names upon density is expected to increase in the future.

Table 2
Statistical Sources

<table>
<thead>
<tr>
<th>Year</th>
<th>Source</th>
<th>Town Population</th>
<th>Total Population</th>
<th>Land-based names</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>Community Leaders</td>
<td>120 (estimated)</td>
<td>240 (estimated)</td>
<td>900</td>
</tr>
<tr>
<td>1986</td>
<td>Aerial Photograph</td>
<td>428 (estimated)</td>
<td>500 (estimated)</td>
<td>900</td>
</tr>
<tr>
<td>1996</td>
<td>Statistics Canada</td>
<td>1000</td>
<td>1000</td>
<td>900</td>
</tr>
<tr>
<td>2001</td>
<td>Statistics Canada</td>
<td>1100</td>
<td>1100</td>
<td>900</td>
</tr>
<tr>
<td>2006</td>
<td>Statistics Canada</td>
<td>1200</td>
<td>1200</td>
<td>900</td>
</tr>
<tr>
<td>2010</td>
<td>Wemindji Web Site</td>
<td>1400</td>
<td>1400</td>
<td>900</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Source</th>
<th>Town Place Names</th>
<th>Town Area (km²)</th>
<th>Wemindji Terr. (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>Aerial Photograph</td>
<td>12</td>
<td>0.11</td>
<td>30000</td>
</tr>
<tr>
<td>1986</td>
<td>Aerial Photograph</td>
<td>24</td>
<td>0.26</td>
<td>30000</td>
</tr>
<tr>
<td>1996</td>
<td>(interpolated)</td>
<td>38</td>
<td>0.46</td>
<td>30000</td>
</tr>
<tr>
<td>2001</td>
<td>Aerial Photograph</td>
<td>60</td>
<td>0.65</td>
<td>30000</td>
</tr>
<tr>
<td>2006</td>
<td>(interpolated)</td>
<td>69</td>
<td>0.75</td>
<td>30000</td>
</tr>
<tr>
<td>2010</td>
<td>Local directories</td>
<td>78</td>
<td>0.85</td>
<td>30000</td>
</tr>
</tbody>
</table>

(1996, 2001, 2006), local statistics (Cree Nation of Wemindji 2010), and aerial photographs (dated 1986, 2001, 2004 and 2008; obtained from the local band office, GIS department) allowed me to piece together a picture of movement from south to north, as well as movement from traditional to local lifestyles, using number of toponyms as a proxy measure of those movements (see Table 2 and Figure 2).

Assuming the developed area in the town of Wemindji proper to be proportional to the number of town toponyms, I directly measured the developed area of Wemindji at four points in time (see Figure 3). The area for 1960 was calculated based on the assumption, corroborated by the key informants, that the early Wemindji town site (i.e., by Loon River) consisted of what corresponds to the current downtown area only, including school, stores, band office, and a few businesses, totalling 12 named town places. The area of downtown, the layout of which has not fundamentally changed in 50 years, was measured on the latest (2008) photograph. Areal measurements at four points provided the profile showing growth in town-based place names. Town area is, however, for the most part irrelevant to calculations of both population and toponymic density, its relevance pertaining only to estimates of number of town place names. The only exception is the second population estimate in which an aerial photograph was used to provide an estimated population figure. The area used to calculate population and toponymic densities was the area of Wemindji territories as a whole (i.e., 30000 km²). This allows for direct comparison of densities longitudinally across the profile. Town place names were not included in toponymic density calculations, explaining the flatness of the toponymic density line. The number of town place names was considered too small to have a meaningful effect on results, with the number of town place names ranging between 1 and 9% of the total. As discussed below, however, the significance of town place names upon density is expected to increase in the future.

Figure 2
Population and place names vs. time
Town place names were gathered using local maps (Cree Nation of Wemindji 2010) and telephone directories. These were validated and verified by local experts including employees of a local construction crew. The construction crew members were considered the most appropriate experts to consult regarding the current list of town place names because these individuals and their ancestors have been present continuously in the Wemindji town site during the last 50 years. They have witnessed and participated in the majority of new construction projects from Wemindji’s inception to its present form. These individuals are better placed to validate and verify the list of place names than teachers, for instance, due to the former’s presence in, and interaction with, all of the named places provided in our list. The latter may also have comprehensive knowledge of these sites but this knowledge is usually and mostly obtained by description rather than experience of each site as it takes shape in situ.

Gaps in data introduce potential error into the analysis, but these gaps, shown in Table 2 where interpolations or estimations are indicated, are either alternated with known figures that provide control on uncertainty, or they alternate in source. The first two population estimates are based on: 1) a list of families provided by two community leaders (one a primary author of Wemindji Turns 50), and 2) an estimate/interpolation drawn from the 1986 aerial photograph. It was also noted by the two community leaders that in 1960 approximately half of Wemindji Cree lived permanently in town (the other half continued to live on the land), and that the move to a permanently sedentary lifestyle was gradual, allowing for the construction of the dotted line portion of population profile shown in Figure 2. Gaps in the data were filled through the use of logical assumption, interpolation, and, where necessary, estimation. Gaps were not considered serious enough to prevent meaningful generalization from results, discussed below.
Results

As mentioned earlier, Hunn (1994, 1996) noted an equality of population density to toponymic density in widely dispersed North American indigenous populations. The proportion on Wemindji Cree lands, based on comprehensive toponymic surveys (898 place names) carried out by Colin Scott and his colleagues in the 1970s, is, as of 2010, approximately 0.045 (population density) to 0.03 (toponymic density) place names per square kilometre, falling close to the line generated by Hunn. As noted above, the area used for this calculation was the total Wemindji territorial extent, rounded to 30000 km².

Figure 4 shows the growth of population density from 1960 to 2010, with a crossover at equality between population and toponymic density occurring in 1995 as town place names grew in importance, and the population of Wemindji rapidly increased. Figure 4 also assumes both durability and constancy of traditional indigenous toponymy in Wemindji, as indicated by the horizontal dashed line showing toponymic density. This assumption carries an implicit regard for the comprehensive nature of the surveys mentioned above (Scott 1983; Basso 1996), and for the ability of the community to recover “lost” toponyms through commemorative and educational initiatives (Cree Nation of Wemindji 2010).

Figure 5 isolates growth in town place names. Figures 2, 4, and 5 suggest that population density in the 1960s was low compared to toponymic density. Local populations had only just begun to rebound from economic hardship introduced in part by a faltering fur trade (influenced in turn by both global demand and by animal scarcities), but also by legacies of colonialism and government policies that had introduced disease (through the presence of foreign viral strains against which local populations were unprepared) and displacement (through institutions such as residential schooling) (Francis and Morantz 1983; Preston 2002; Morantz 2002).

Discussion

The overall trend indicated by Figure 4 is upward between 1960 and 2010 with population densities increasing from 0.01 to approximately 0.045 across that time period. This observation will guide discussion in two directions. The first deals with differences between population and toponymic densities in the early part of the graph, while the second deals with possible future trends indicated by the later part of the graph. After these two main points have been covered, the discussion will move to addressing two possible objections.

First, Figure 4 indicates that there was a large difference (more than 0.02) between population and toponymic density at around the time of the establishment of the new town site of Wemindji. Some possible explanations for this difference were alluded to at the end of the results section, but they remain speculative. Possible explanations such as those mentioned above (i.e., economic or health problems attributable to the fur trade or to colonial and government policy) are for the most part qualitative observations and as such do not fit quite properly with the quantitative thrust of this article.
On the other hand, where qualitative approaches are used (as described in the Methodology), the approach is very much focused upon obtaining answers to questions of a quantitative nature that they are not likely to illuminate questions of a postcolonial and critical nature. This is an inherent limitation to the approach taken here, but it does not impact the main finding, that of the equality of population and toponymic densities in 1995.

Second, and flowing from that main finding, there is reason to believe that the upward trend will continue, resulting in a large positive difference between population and toponymic densities in the future. There will be a continued move away from the line generated by Hunn (1996) as population increases, but it will not be as drastic as it might at first appear. The reason for this is that growth in town-based toponyms will continue to the point where their inclusion in the calculation would become significant (i.e., when they make up greater than 10% of the total number of toponyms). This would indicate both growing urbanization of indigenous lifeworlds as well as a move away from land-based life. Urbanization and centralization are a fact of life in northern indigenous villages in Quebec and in some places across Canada. While town- and land-based life are often held in delicate balance, there seems to be a point at which a village will crossover to a predominant dependence upon wage labour that supersedes the ability to be on the land as much as would be desired. A possible proxy measure of this crossover point is indicated by the point of equality shown on Figure 4, where population and toponymic densities were equal (i.e., 1995).

At this point in the discussion possible objections are addressed. Figure 4 suggests that the proportion of Wemindji’s toponymic densities with respect to population densities has been at or close to equality in recent times. I anticipate and deal with two possible objections (one hypothetical, and one that comes up in conversation with non-experts on toponymy) to the suggested significance of this observation below. The first (hypothetical) objection is that traditional and town place names represent different, distinct (and thus not comparable) toponymies. This could be characterized as an apples and oranges problem.

The second objection (often heard in casual conversations about toponymy) refers to the idea that an equality of toponymic and population densities means that for each person there corresponds a place name, with the implication that this must therefore be a coincidence. This would further imply that Hunn’s correlation (1996) for several North American indigenous groups is a correlation without causation.

To address the first objection I return to the observation above that place names serve functions. They should not necessarily be viewed taxonomically as different kinds of categorical things. This view is corroborated by Hunn and Meilleur (2010, 17–19) who note that place names act as place holders for the formation of ecotopes which are in turn human constructions for efficient recall of large lists of resources, primarily plants and animals. In their words, “given that this is a spatial partition, the formal properties will be ‘partonomic’ rather than taxonomic ...[and] relations of contiguity are more fundamental than relations of similarity” (Hunn and Meilleur 2010, 17). More fundamental, then, than splitting place names between those that are traditional and those that are modern (though this splitting is useful for the purposes of this article) is the idea that named places are grouped together, in some places more densely, in other places less so, due to the functional and ecotopic relations between those places. Wierzbicka (1984, 321), with reference to collections of named objects that serve functions, notes that “they stand for things of different kinds that occur as groups, or collections, of things of different kinds kept in one place.”

To illustrate with reference to ecotopes, toponyms fit into the picture in the following way. Hunn and Meilleur (2010) use the number 500 to point out that named places serve the function of keeping track of locations of useful plants and animals. For 500 named places, each of which contains 500 animals and 500 plants, they point out that, using only these two concepts (toponyms and plant/animal names), the cognitive load for an individual human would be 500 place names times (500 plant names + 500 animal names) for a total of 500,000 pieces of information. They posit that this is the impetus for indigenous delineation of ecotopes that occur across different traditional societies in North America. The ecotopes serve as bridges for combining named places with the resources located at those places. According to Hunn and Meilleur (2010, 18), “we believe that naming ecotopes saves mental energy and enhances the efficiency of subsistence activities by facilitating the integration of these two massive databases, the ethnobiological and the toponymic.”
It does not matter what kind of place name is used to add to this “database,” what matters is the resources (and the functions they serve) that are located at the named place.

The second objection requires some counter-intuitive insight into the nature of toponymy vis-à-vis population and the areas in which both reside. The fact that there is a correlation (Hunn 1996) between toponymic and population density does not mean (as is often the first reaction to my introduction of this observation in casual conversation) that the addition of an individual to a population necessitates the addition of a toponym within the area inhabited by that population. During the course of a lifetime, each individual in a given area—in this case in the traditional territories of the Wemindji Cree—has meaningful interactions with hundreds of named places. The number of named places with which any given individual interacts during a lifetime is highly variable between individuals of the same community, and it also varies during the course of an individual lifetime, and as a culture evolves over longer periods of time. Any easy notion of a place name for each person is easily confounded by these observations.

Two further observations serve to address hesitations (by those, Cree and non-Cree alike, to whom this study is mentioned in conversation) about equality between toponymic and population densities and the perception that this necessitates the creation of a new toponym with the addition of a new individual to a cultural area. The first is that cultural activity is intense. This intensity can be measured by carefully delineating meaningful areal units and calculating the density of specific phenomena, or proxies thereof, that occur within those units. I argue here that toponyms represent such proxies. As indicated above, toponyms help with the efficiency of recall toward locating resources. An area that is dense with names is therefore an area (or set of places or ecotopes) that is rich with resources and associated beliefs, transportation systems, and technologies designed to deal with the practicalities of the extraction and efficient use of those resources. The second observation follows, that while the meaning of place names may have subjective associations, their significance is objective and collective. It may be the case that each named individual has a name and a home, but the name of that home is variable, distributed, and ineluctably tied to intersubjective and cultural connotations of meanings not only of home but also of dwelling, skill, technology, and the environment (Ingold 2000, 2007, 2010).

Conclusions

The beginning of this article alluded to a debate that is old but that is both unresolved and, I believe, still worthy of serious debate as indicated by recent (re) assertions that the number 500, for instance, remains not only viable but unproblematic (Hunn and Meilleur 2010). Using theoretical insights of anthropologists such as Hunn (1994, 1996) and Kelly (1994) I have attempted to recover this lost debate by bringing to light new empirical data from eastern James Bay Quebec. Measurement of toponymic versus population densities over a 50-year period in the town of Wemindji opened up new dimensions of the debate, including variability over time. Colonization and incorporation into state and industrial interests driven by globalization have brought Wemindji into the modern world. The movement of the original residents of Wemindji is part of a greater movement towards town life that has been repeated in various forms and to different degrees in other parts of James Bay, and also in other parts of the world. The present analysis provides a benefit in the replicability of its methodology for other places and times where sufficient data exist to allow the use of this method.

The most significant findings of this study are twofold: first, that toponymic and population densities were equal in Wemindji in 1995; second that the upward trend of population density in Wemindji is expected to continue, with the implication that population density will continue to exceed toponymic density well into the future as improvements in quality of life continue. These findings are qualified first by the fact that Wemindji in 1995 represents only one location at one point in time and, while this point conforms to equality of population and toponymic density and thus to Hunn’s line (Hunn, 1996), it remains to be demonstrated whether replication of the methodology achieves the same results in other (proximate or distant) locations. The second qualification is that while the difference between population and toponymic density is expected to continue, the difference will be less than that made apparent here due to an increased significance (i.e., proportion) of town-based toponyms.
References


USING e-ANNOTATION TOOLS FOR ELECTRONIC PROOF CORRECTION

Required software to e-Annotate PDFs: Adobe Acrobat Professional or Adobe Reader (version 8.0 or above). (Note that this document uses screenshots from Adobe Reader X)

The latest version of Acrobat Reader can be downloaded for free at: http://get.adobe.com/reader/

Once you have Acrobat Reader open on your computer, click on the Comment tab at the right of the toolbar:

This will open up a panel down the right side of the document. The majority of tools you will use for annotating your proof will be in the Annotations section, pictured opposite. We’ve picked out some of these tools below:

1. **Replace (Ins) Tool** – for replacing text.

   ![Replace Tool](image)

   Strikethrough through text and opens up a text box where replacement text can be entered.

   **How to use it**
   - Highlight a word or sentence.
   - Click on the Replace (Ins) icon in the Annotations section.
   - Type the replacement text into the blue box that appears.

2. **Strikethrough (Del) Tool** – for deleting text.

   ![Strikethrough Tool](image)

   Strikethrough through text that is to be deleted.

   **How to use it**
   - Highlight a word or sentence.
   - Click on the Strikethrough (Del) icon in the Annotations section.

3. **Add note to text Tool** – for highlighting a section to be changed to bold or italic.

   ![Add Note Tool](image)

   Highlights text in yellow and opens up a text box where comments can be entered.

   **How to use it**
   - Highlight the relevant section of text.
   - Click on the Add note to text icon in the Annotations section.
   - Type instruction on what should be changed regarding the text into the yellow box that appears.

4. **Add sticky note Tool** – for making notes at specific points in the text.

   ![Add Sticky Note Tool](image)

   Marks a point in the proof where a comment needs to be highlighted.

   **How to use it**
   - Click on the Add sticky note icon in the Annotations section.
   - Click at the point in the proof where the comment should be inserted.
   - Type the comment into the yellow box that appears.
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5. Attach File Tool – for inserting large amounts of text or replacement figures.
   
   Inserts an icon linking to the attached file in the appropriate pace in the text.
   
   How to use it
   - Click on the Attach File icon in the Annotations section.
   - Click on the proof to where you'd like the attached file to be linked.
   - Select the file to be attached from your computer or network.
   - Select the colour and type of icon that will appear in the proof. Click OK.

6. Add stamp Tool – for approving a proof if no corrections are required.
   
   Inserts a selected stamp onto an appropriate place in the proof.
   
   How to use it
   - Click on the Add stamp icon in the Annotations section.
   - Select the stamp you want to use. (The Approved stamp is usually available directly in the menu that appears).
   - Click on the proof where you'd like the stamp to appear. (Where a proof is to be approved as it is, this would normally be on the first page).

7. Drawing Markups Tools – for drawing shapes, lines and freeform annotations on proofs and commenting on these marks.
   
   Allows shapes, lines and freeform annotations to be drawn on proofs and for comment to be made on these marks.
   
   How to use it
   - Click on one of the shapes in the Drawing Markups section.
   - Click on the proof at the relevant point and draw the selected shape with the cursor.
   - To add a comment to the drawn shape, move the cursor over the shape until an arrowhead appears.
   - Double click on the shape and type any text in the red box that appears.

For further information on how to annotate proofs, click on the Help menu to reveal a list of further options: