RESEARCH ARTICLE

Responding to Modern Flooding: Old English Place-Names as a Repository of Traditional Ecological Knowledge

RICHARD L.C. JONES

ABSTRACT

Place-names are used to communicate Traditional Ecological Knowledge (TEK) by all indigenous, aboriginal and First Nations people. Here and for the first time, English place-names are examined through a TEK lens. Specifically, place-names formed in Old English—the language of the Anglo-Saxon—and coined between c. 550 and c. 1100 A.D., are explored. This naming horizon provides the basic name stock for the majority of English towns and villages still occupied today. While modern English place-names now simply function as convenient geographical tags Old English toponymy is shown here to exhibit close semantic parallels with many other indigenous place-names around the world. Seeing Old English place-names as a hitherto unrecognised and unexploited repository of TEK may have exciting and important consequences. By identifying the climatic and meteorological correspondences that can be drawn between the period of place-naming and the present day, this paper explores how early medieval water and woodland names might offer new perspectives on, and perhaps solutions to, flooding, the most serious environmental threat currently facing the UK.

INTRODUCTION

Place-names are essential communicative tools for all indigenous, aboriginal, and First Nations peoples. For these communities the names given to features in the landscape help them to share Traditional Ecological Knowledge (Berkes 1999). This function elevates indigenous place-names from being simply passive *markers of space* to being active *makers of place*. To fulfil this purpose, indigenous names explicitly seek to convey a wide range of information, variously and often simultaneously, providing meaningful descriptions of both the physical realities of particular locations *and* signalling the social, economic, cultural, symbolic, and ideological values attached to them (Fair 1997: 478).

The traditional ecological knowledge embedded in place-names is examined here in a hitherto overlooked context: England. Put centre stage are the names of places coined by speakers of Old English, the language of the Anglo-Saxons, which were planted on the English landscape between *ca.* 550 and *ca.* 1100 A.D. Thousands of these names survive,

albeit often in changed forms. They account for the majority of town, village, and hamlet names still in use today, as well as other many landscape feature names (Watts 2004). In this paper, the traditional ecological knowledge credentials of these Old English place-names are established for the first time and partially codified.

In other parts of the world, it is now commonplace for the traditional ecological wisdom found in indigenous place-names to be drawn upon in contemporary efforts to build sustainable and resilient communities. This has been particularly effective where communities and their landscapes have been threatened by environmental change (e.g., Inglis 1993; Lefale 2010; Riedlinger and Berkes 2001). This has not been true in the West, where the environmental threat is no less serious, but where traditional ecological knowledge has been seen (if it has been seen at all) as a poor relation to modern scientific data. Increasingly, however, it is being recognized that science, technology, and engineering may not hold all the answers to tackling the biggest environmental challenges of the age.

This is certainly true for flooding, the most significant natural threat now facing Western Europe and one predicted to worsen in the next few decades (Committee on Climate Change 2016, chapter 3). Since the turn of the millennium, extensive and destructive winter flooding has become an almost annual experience across the United Kingdom—and spring, summer, and autumn flooding has become more commonplace. The heavily populated English river catchments of the rivers Severn, Thames, and Trent have been particularly severely affected (Marsh and Hannaford 2007). Low-lying wetlands such as the Somerset Levels have also proven to be particularly vulnerable. Problems caused by riverine flooding have been exacerbated by periodic marine transgressions especially along the North Sea coast and, as result of rising global temperatures and climatic instability leading to extreme weather events—in particular heavy precipitation—few areas are now safe from surface run-off flooding (Thorne 2014).

In recent years, there has been a shift away from near total reliance on hard engineering and technological responses to flooding toward approaches that work more closely with nature. It is argued here that once Old English place-names are seen as a repository for traditional ecological knowledge, they become a useful resource via which to think, particularly when trying to find the natural and anthropogenic causes of, and solutions to, flooding. Furthermore, the potential value of these names is suggested here to be further enhanced because of the climatic and meteorological correspondences that emerge between the period during which theses names were first coined and those of the present day.

TRADITIONAL ECOLOGICAL KNOWLEDGE IN OLD ENGLISH PLACE-NAMES: A GLOBAL PERSPECTIVE

The Old English place-name stock runs into many thousands. These have been conventionally divided into three basic categories: topographical names that take their cue directly from the natural landscape; habitative names which refer to the cultural landscape including whole settlements and individual buildings; and folk names that derive from the collective names of the resident populations (Gelling 1978). This categorization has structured all subsequent thinking about the nature of these names and has arguably been a significant hindrance to establishing their original purpose.

These groupings, which emphasis the nature/culture divide, are very modern and western in conception. They do not respond in any meaningful way to the early medieval worldview, and there can be little doubt that the present categorization of these names would not be recognized by those who first coined them. Within the Anglo-Saxon worldview, people were seen as microcosmic representations of the macrocosm. Since everything in the cosmos was believed to be built from the same four elemental foundations—earth, water, air, and fire—no distinction could be drawn between the outside world and the inner workings of the body or between natural and cultural

spheres. In short, the Anglo-Saxons accepted their total absorption in their environment and readily acknowledged that they were shaped by it (Jones 2013). In holding such views, of course, Anglo-Saxon cosmologies align much more closely with those found in many contemporary indigenous cultures than with those now held by their direct descendants in Britain for whom such ideas were abandoned in the Enlightenment or Age of Reason. By examining the form and function of place-names in indigenous contexts, then, new and arguably more authentic readings of Old English place-names may emerge.

While indigenous naming practices have received considerable attention in recent years (e.g., Altman 2006; Blackstock 2001; Boillat et al. 2013; Davidson-Hunt and Berkes 2003; Fair 1997; Hercus et al. 2002; Koch and Hercus 2009; Johnson 2010; Kharusi and Salman 2015; Si 2016; Sommerseth 2011; Thornton 1997), no formal indigenous toponymic taxonomy has yet been proposed. All place-naming systems are, of course, unique. Each is shaped by the particularities of the semantic and lexical fields that structure the languages of those who name. Each responds to the physical environments in which the names must operate. All are contingent upon the cultural values of the naming group. And, importantly, all remain fluid and subject to modification over time as a consequence of social, cultural, linguistic, and environmental change (Kronenfeld and Rundblad 2003). No single classificatory model will ever account for the constellation of indigenous naming practices found across environments as diverse as the polar ice-fields and equatorial rain forests. But emerging from these studies are repeating sets of semantic place-name themes that appear common if not universal to traditional ecological knowledge naming. Six basic cross-cultural categories of traditional ecological knowledge place-names might be generalized.

1. Topographical names. These are the most common name type irrespective of geographical context. They describe the lie of the land providing baseline data for the mental mapping of the physical geography of

any territory. Such place-names mark out the general characteristics of land use, such as by signalling forest zones and/or open country. Hydronyms describing water in the landscape represent an important subset covering a wide spectrum of aquatic environments from rivers and other water channels, through lakes and other large bodies of water, to wetlands such as marsh, fen, and moor.

2. Subsistence names. Mapping the key natural resources within a territory, subsistence place-names play a primary role within all traditional ecological knowledge naming. Such names are again generally found in abundance. They help to identify animals, plants, soils, mineral resources, and stone, the vital local sources for food, medicine, building, and tool- and artefact-making. Subsistence names invariable reflect the normative activities of particular indigenous peoples: thus, for hunter-gather groups, place-names help to locate wild animals and plants in the landscape; while for more sedentary groups, cultivated grounds feature more prominently within their toponymy. Subsistence names include two important subsets: names which describe people's interaction with the environment—activities such as hunting and fishing, tree clearance, and quarrying—and names which describe non-human spatial inter-relationships such as the symbiotic associations that link animals, plants and soils in certain locations.

3. Social names. These names acknowledge individual, family, kinship, and group associations with particular places. Such place-names can deal with matters of ownership, but are more commonly used to define private and communal rights over and access to space and resources. Such place-names perform the important task of cementing social relationships. They reinforce established societal structures among indigenous groups and normative behaviours. They reflect prevailing cultural ideas relating to age, status and gender; and can reveal other forms of individual and group identity, for example identifying specific locales associated with, among others, elders, shaman, or craftspeople.

4. Memory names. These names provide an essential historical dimension to territories, tying people to the land by locating them in this relationship in time as well as space. Place-names of this type communicate a variety of messages, variously recording local history and significant events, connecting present occupants of the land to their ancestors; and preserving origin stories and communal myths and legends. Such names provide user groups with a sense of both absolute and relative chronology.

5. Religio-spiritual names. These are place-names which mark out sacred, religious, and ritual space. They acknowledge the presence of spirits and gods in the landscape past and present. They also offer frameworks for communicating cosmological ideas and wider understandings of the world, as well as establishing a community's duty of care for the environment.

6. Movement and settlement names. Place-names in this category map out paths, and lines of travel and communication. Such names can be cautionary highlighting places of safety and danger. They can be applied both to travel on land and water. They communicate information not only about moving along established pathways but advice about how to overcome natural barriers such as river crossings. The group also includes a large set of names marking the location of permanently occupied settlements, as well as temporary and seasonal camps.

These categories feel more empathetic to the real concerns of indigenous peoples, but in reality many of their place-names defy such simple subdivision. Names, for instance, which speak of what must be given back to the land in return for what has been taken, characterized here as religio-spiritual names, might equally be seen as resource management names and placed among the subsistence names. For the indigenous groups who originally coined these names and still draw on the information they contain—whose lives are embedded and inseparably entangled in their environment; who rarely recognise a distinction between nature and culture; and whose quotidian experience and spiritual well-being cannot be separated out—categorizing names so strictly like this makes no sense. But it does at least provide a yardstick against which Old English place-names might be examined and their traditional ecological knowledge credentials tested.

It is not difficult to identify individual Old English place-names, and often tens of examples, which fall into the broad traditional ecological knowledge name categories defined (Table 1). Taken altogether, Old English place-names can be shown to provide rich descriptions of the physical landscape of England. They vivify the Anglo-Saxons' sense of place and their feel for the subtleties of topography and texture of the land (Gelling 1993; Gelling and Cole 2000). They consistently provide detailed information about the management and exploitation of the land (Coates 2012), the location and availability of natural resources (Hooke 2010), its flora and fauna (Hough 1997-8; Aybes and Yalden 1995), local agricultural practices, and even track the seasonal movements of people and animals (e.g., Fox 2008). They mark the location of permanent settlements, temporary camps, and routes through the landscape (Cole 2012) and on water (Cole 2007). They map out social worlds through reference to named individuals (Hough 2013; Insley 2013) and specific groups of people (e.g., Finberg 1964)—on occasion identifying prevailing social hierarchies, patterns of ownership, and administrative spaces (Parsons 2013). They provide historical depth to the landscape by recording past events and human activities (Jones 2016), thus preserving memory and helping in acts of remembrance. And they mark out the spiritual geography of the land and its people (Hall 1996; Semple 1998; 2007).

While basic correspondences between Old English place-name themes and those found in other indigenous contexts are reassuring, near exact parallels add confidence to the idea that the Anglo-Saxons conceived their names for similar purposes. On Baffin Island in the Canadian Arctic, for instance, Inuit place-names such as

TABLE 1. Traditional ecological knowledge in Old English place-names.

Category	Modern names	County	Old English elements	Meaning
Topographical	Brentor	Devon	***brente + torr**	'steep hill topped with rocky peak'
	Eye	Suffolk	ēg	' island'
	Winterbourne	Various	**winter-burna**	'stream that flows in winter'
Subsistence	Ashurst	Sussex	æsc + **hyrst**	'ash-tree wooded hill'
	Ely	Cambridgeshire	ǣl + **gē**	'eel district'
	Smerrill	Derbyshire	**smeoru + hyll**	'butter hill'
Social	Fiskerton	Nottinghamshire	**fiscera + tūn**	'fishermen's settlement'
	Wakefield	Northamptonshire	**wacu + feld**	'open land where festivities/wakes are held'
	Wychwood	Oxfordshire	**Hwicce + wudu**	'forest of the Hwicce people'
Memory	Aldwick	Sussex	**eald + wīc**	'old farm or trading place'
	Flitteridge	Sussex	**(ge)flit + hrycg**	'disputed ridge'
	Follifoot	Yorkshire	**fola + feoht**	'place where horse-fights were held', lit. 'foal fight'
Religio-spiritual	Drakelow	Derbyshire	**draca + hlāw**	'dragon's mound'
	Harrow	Middlesex	**hearg**	'heathen temple(s)'
	Kidderminster	Worcestershire	***Cydder + mynster**	'Cydder's monastery'
Movement/ settlement	Drayton	Various	**dræg + tūn**	'place at a portage or at a place where loads have to be dragged'
	Slaughterford	Worcestershire	**slāh-þorn + ford**	'muddy ford'
	Somerton	Various	**sumor + tūn**	'summer farm or estate'

Iqalufgalik ('Artic cod here'); **Ukalialuk** ('where rabbits are plentiful'); **Ullirjuaq** ('resting place for walrus'); **Ukkusitsarjuaq** ('stone that Inuit used to make "**qulliq**" stone lamp'); **Ingiuliktuuq** ('the water in this place always wavy') all have a direct bearing on cultural and subsistence practices in this challenging environment (Inuit Heritage Trust 2013). These names map out vital sources of protein, raw materials for use in manufacture, past and future human activity, and natural dangers.

In England, Elmer (**ael + mere**)—conventionally read literally as eel pond—could equally be glossed 'pond where eels to be found.' Harley (**hara + lēah**: 'the hare clearing/wood') must have once spoken of the abundance of hares found there potentially available for trapping. Assuredly, Selsey (**seoles + īeg**: 'seal island') resonates with the Inuit's 'resting place for walrus.' Quorndon (**cweorn + dūn**: 'hill where quern-stones are obtained') matches the Inuits' **Ukkusitsarajuaq**. While Gussage (***gyse + sīc** or

*****gysic**: 'the gushing stream') must have warned the local community of the dangers of water just as **Ingiuliktuuq** continues to do (Watts 2004, *s.n.*). In short, the traditional ecological knowledge credentials of the Old English place-name corpus appear strong.

TRADITIONAL ECOLOGICAL KNOWLEDGE IN OLD ENGLISH PLACE-NAMES IN LOCAL CONTEXT

Treating any place-name abstractly and in isolation offers only a partial picture of its purpose and utility. It is only when names are brought together and spatially contextualized that they can be seen to be most effective in communicating traditional ecological knowledge. Fortunately in some places it is possible to walk in the footsteps of the Anglo-Saxons and observe how they mapped out the complexities of familiar space. The evidence comes in the form of descriptions of estate boundaries appended to charters drawn up on the transfer of land. The charters themselves tended to be written in Latin—the language of law and bureaucracy—but the boundary clauses were invariably written in Old English, the language of the people. Most trace the perimeter moving clockwise (sunwise) around the estate. Their bounds were broken into short stretches, using intervisible or easily distinguished features as markers of its line. Conventionally, descriptions adopt the formula 'from A to B; from B to C; from C to D; etc.' Such repetition of the names of landmarks may well reflect how these became embedded in social memory. In both language and form, then, these boundary descriptions belong not to a written, but to an oral and vernacular tradition—the communicative milieu for almost all traditional ecological knowledge elsewhere. And the familiarity with the local landscape that is exhibited in these boundary clauses must surely also indicate that they were drawn up with the help of the resident community.

The land boundaries of the small estate of Barnhorn (Sussex) described in a charter of 772 A.D. (S108)[1]

might stand as an archetype (name repetitions have here been removed):

'First as far as moss spring…south to the coomb… up to the little heath open land to puck's/goblin's spring so south and east to the old linear clearing along [the] ride to the old boundary beech-tree that stands to the east side of the ride into the deep coomb to willow pool…to five ways and so south to the red drain/ditch along [the] stream to **pican** (meaning unknown) enclosure so south by the eastern part of [the] marsh as far as the corner so east to yew enclosure so north to the wood and so east by the wood and so south to dish's/scoop's barrow… to dish's/scoop's spring west along [the] stream to Thor's clearing and so along [the] stream west around the salt marsh and so north to black/pale/shining stream…to swine water-meadow/enclosure north along [the] marsh to Sigeferth's poor pasture and so as far as the northern foul ford and so up to the old ditch/dyke…east and back to moss spring.'

Although numbering less than thirty individual landmarks, a wealth of ecological information is contained within this toponymic assemblage. Tellingly, these names all fall easily into the six proposed traditional ecological knowledge name-categories and, indeed, are representative of the whole spectrum (Table 2). Barnhorn lies remote from other described estates. But in other places, sets of boundary descriptions survive which provide a fuller picture of the distribution of traditional ecological knowledge names across wider landscapes. In some places, these can be mapped on the ground as is the case for the catchment of the River Itchen (Warwickshire), a natural watershed which appears to have been adopted as a unified social and administrative unit (S588; S892; S898; S1574; Hooke 1999) (Figure 1). And this is true also for the former royal estate of Southwell (Nottinghamshire), granted by King Eadwig to Archbishop Osketel of York in 956 A.D. (S659) (Figure 2). In both instances, a detailed picture emerges of the topography of these two estates, their natural and agricultural ecosystems, the social and spatial organization and

Table 2. Basic traditional ecological knowledge categorization of named features on the estate boundary of Barnhorn

Topographical	Subsistence	Social	Memory	Religio-Spiritual	Movement-Settlement
coomb	moss spring	Thor's clearing*	old linear clearing	goblin's spring	ride
deep coomb	heath open land	Sigeferth's poor pasture	old boundary	Thor's clearing*	five ways
red drain/ditch	beech tree		dish's/scoop's barrow		**pican's** enclosure
stream	willow pool				foul ford
marsh	yew enclosure				
wood	salt marsh				
spring	swine water-meadow				
ditch/dyke					

beliefs of their local populations, and their sense of history.

As rich and as heavily laden with traditional ecological knowledge these collections of boundary names (or names on their way to becoming place-names) appear to be, they only describe points on the edges of these estates or along important internal boundaries. Even in the best documented areas, we are left with only a fraction of the names that must have formerly been in circulation during the Anglo-Saxon period. The full extent of the traditional ecological knowledge originally conveyed by Old English names will always therefore remain out of reach. But there can be little doubt on the basis of those that have come down to us that communicating accumulated traditional ecological knowledge was one of their primary functions.

OLD ENGLISH PLACE-NAMES IN CLIMATIC CONTEXT: PAST AND PRESENT

Precise dating of Old English place-names is also impossible. But as a Germanic language, a **terminus post quem** is provided by the arrival of the Anglo-Saxons in England around the beginning of the fifth century A.D., while dates of first reference in historical documents—notably the large number of Old English place-names first recorded in Domesday Book (1086)—provide a **terminus ante quem** for their formation and application. The adoption of certain name forms and the specific vocabulary deployed to describe the character of places can, however, be assessed at various points across these six centuries through censuses of the name elements recorded in early medieval written sources. Among those names recorded before 731 A.D., for instance, water names are particularly common, including the elements ēg 'island', **ford** 'river-crossing', **hamm** 'water-meadow or land hemmed in by water', and **burna** 'bourne or stream.' On the other hand, name elements such as **tūn** 'estate, farm, village' (modern –ton) that would become ubiquitous by the end of the period were still rare at this date (e.g., Cox 1975-76). If still fuzzy, our chronological understanding of place-name formation in England is at least sufficiently established to examine them against the climatic and environmental background of the time.

FIGURE 1. Major and minor Old English place-names recorded in Anglo-Saxon charters dated between 956x1001 A.D. within the catchment of the River Itchen (Warwickshire).
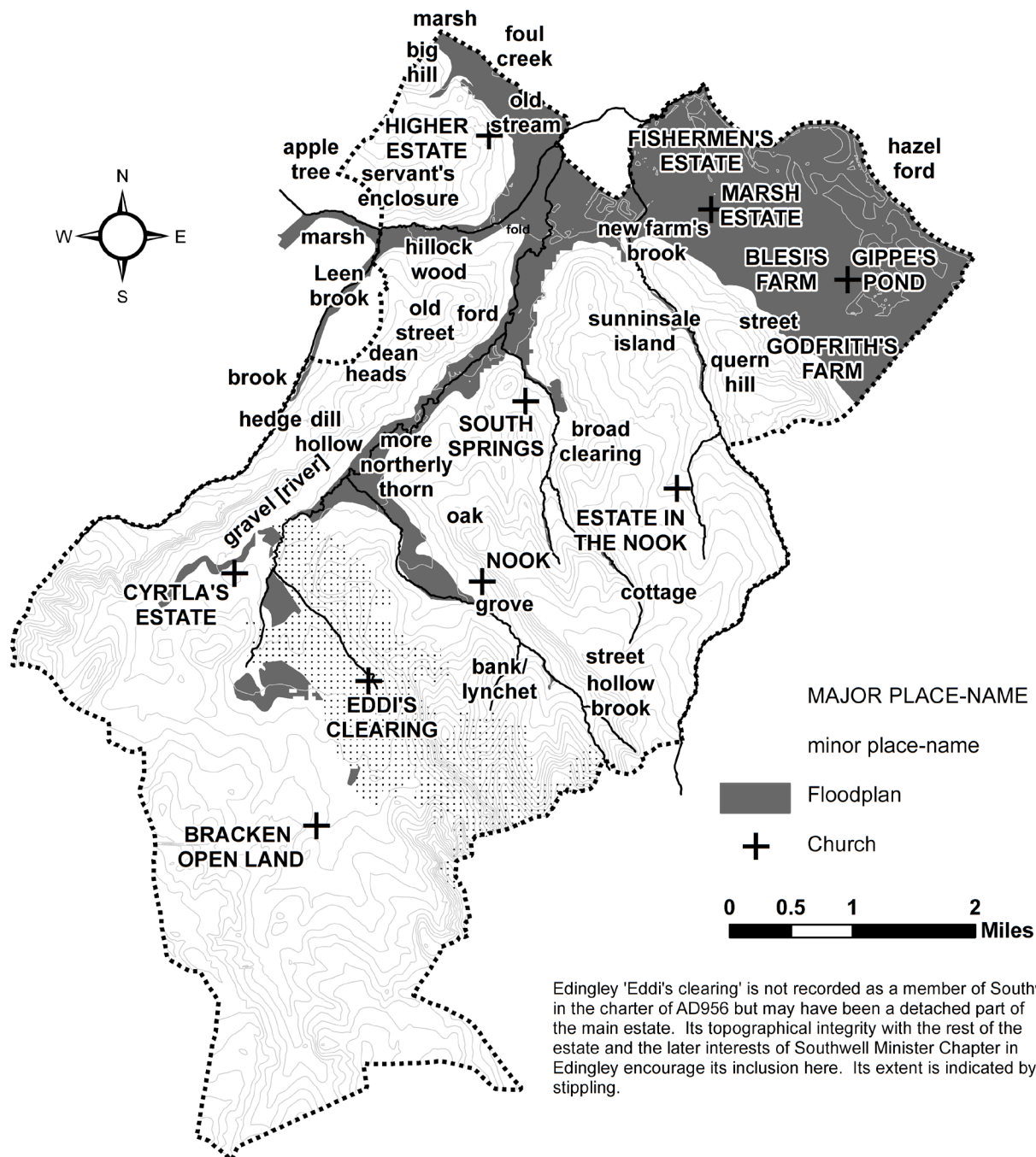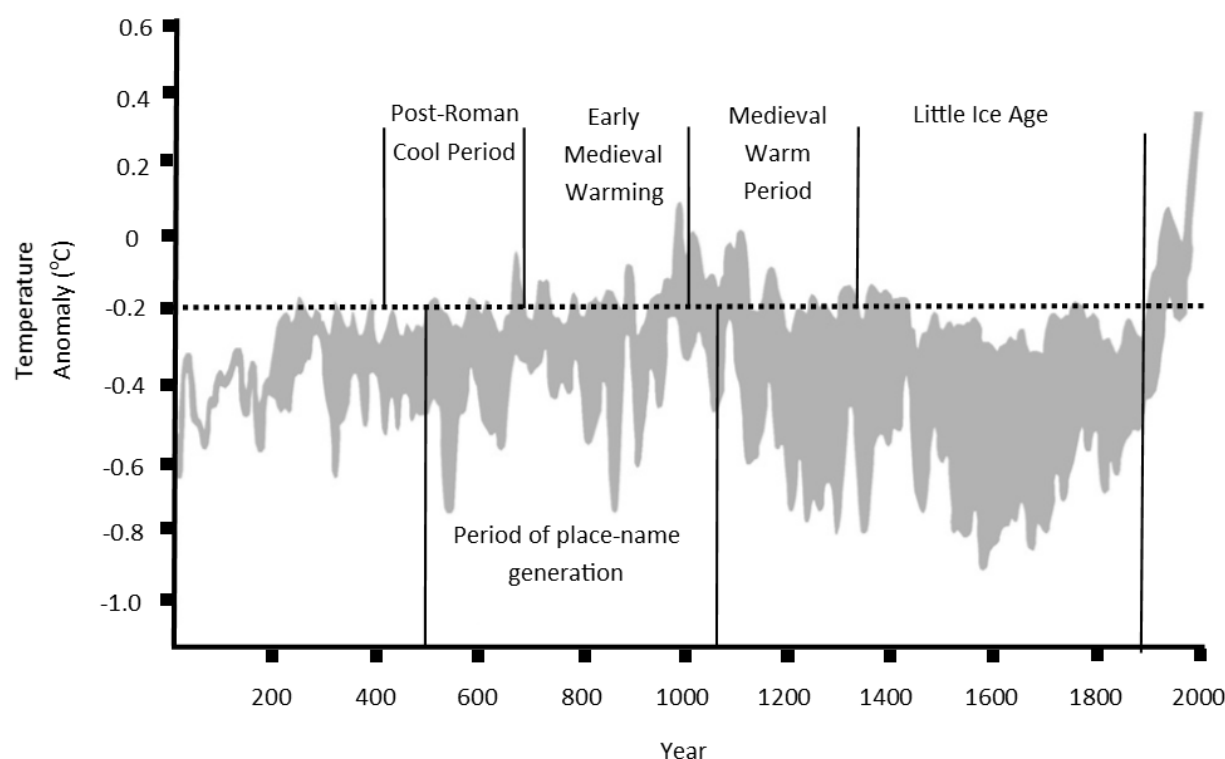
marsh
foul
creek
big
hill
old
stream
apple
tree
HIGHER
ESTATE
servant's
enclosure
FISHERMEN'S
ESTATE
hazel
ford
MARSH
ESTATE
marsh
hillock
wood
fold
new farm's
brook
BLESI'S
FARM
GIPPE'S
POND
Leen
brook
old
street
ford
sunninsale
island
street
quern
hill
GODFRITH'S
FARM
brook
dean
heads
hedge dill
hollow
more
northerly
thorn
SOUTH
SPRINGS
broad
clearing
ESTATE IN
THE NOOK
gravel [river]
oak
NOOK
grove
cottage
CYRTLA'S
ESTATE
bank/
lynchet
street
hollow
brook
EDDI'S
CLEARING
BRACKEN
OPEN LAND

N
W   E
S

MAJOR PLACE-NAME

minor place-name

Floodplan

✝ Church

0   0.5   1   2
Miles

Edingley 'Eddi's clearing' is not recorded as a member of Southwell
in the charter of AD956 but may have been a detached part of
the main estate. Its topographical integrity with the rest of the
estate and the later interests of Southwell Minister Chapter in
Edingley encourage its inclusion here. Its extent is indicated by the
stippling.

FIGURE 2. Southwell (Nottinghamshire). Names recorded in 956 A.D.

FIGURE 3. The 'hockey-stick' graph after image created by Robert A. Rohde / Global Warming Art [2]

While controversial, the so-called 'hockey-stick' graph (Figure 3), a reconstruction of mean annual temperatures in the northern hemisphere over the last two millennia, and derived from environmental proxies such as tree-ring data and ice-cores, shows the early medieval period (the period of Old English place-naming) to be the last episode on record of relatively rapid global warming (Mann et al. 1999; Mann and Jones 2003; Mann 2014; McIntyre and McKitrick 2009). Dendrochronology suggests that this early warming phase was associated with significant climatic instability across northern Europe (e.g., Cantwell 2000:68-81; Linderholm and Gunnarson 2005). Trees in northern latitudes exhibit rapid growth spurts indicative of favorable conditions interdigitated by narrow rings indicating the opposite, the two oscillating more violently across the seventh to tenth century than any preceding or subsequent period. Other records indicate raised levels of storminess associated with various interactions of the North Atlantic Oscillation

(atmospheric pressure) and Atlantic Multi-decadal Oscillation (sea temperature) (Van Vliet et al. 2014). Reconstructed storm tracks show the United Kingdom lay directly in the path of Atlantic storms from the late eighth century through to the tenth century (Figure 4).

The physical effects of these climatic changes, notably higher precipitation and more intense rainfall events, are captured in the geoarchaeological record. Between ca. 700-900 A.D., rates of alluviation rose quickly along many English rivers, a direct indicator that river-channels were unable to cope with raised water levels and flow rates (Rippon et al. 2015, 94-5 and references therein). Floodplain development was more intense and more extensive during these early medieval centuries than at any other period of history. Anglo-Saxon England may not have been a waterworld, but it emerges as one of the wettest and most unstable on record. And it is against this backdrop of climate change that Old English
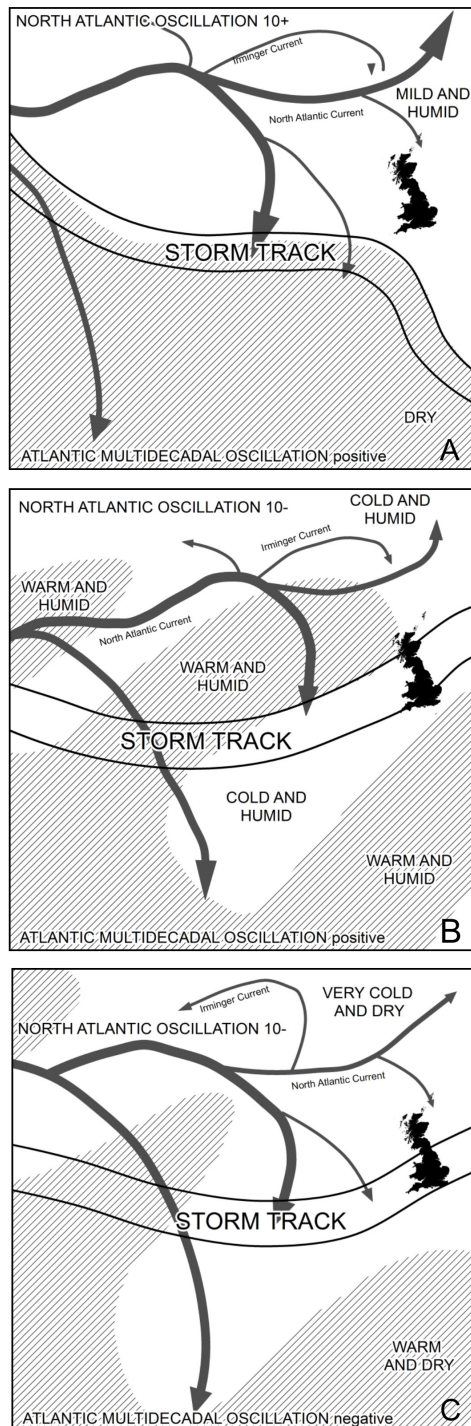
FIGURE 4. Atlantic storm tracks affecting Great Britain past, present and future: A) 1985-2003 and tenth century A.D.; B) 2003-2030? and late eighth and ninth centuries A.D. ; C) 2030?-2060? and sixth century A.D. Redrawn from Van Vliet et al. (2014)

names—and the traditional ecological knowledge they contain—need to be read. That there are many hundreds of names that indicate the local presence, behavior, and characteristics of water in the landscape thus finds a clear natural explanation. But this also indicates that for the Anglo-Saxons the wet appears to have gained societal and cultural significance, too.

Parallels with our own times are easy to draw. The recent increased threat of flooding is widely linked to climatic change. We are in a phase of unprecedented warming. But the closest historical matches to be found are those conditions that prevailed in the early Middle Ages. Indeed, if a gradient were to be calculated from minimum to maximum values represented on the 'hockey-stick' graph at the beginning and end of the tenth century, the rate of warming at this period comes close to that witnessed during the last one hundred years (Figure 3). Tellingly, recent, current, and future storm tracks affecting the United Kingdom are also expected to mimic those experienced at various stages of the early Middle Ages (Figure 4). The increased frequency and severity of United Kingdom storms beginning around the turn of the millennium mark the point when the Atlantic storm track moved further north the cross the country, a track followed previously in the eighth and ninth century. The United Kingdom is predicted to remain under this track until *ca.* 2030. Thereafter, current warm and wet conditions are expected to be replaced by warmer and drier conditions paralleling those previously experienced in the sixth century. Here too on the 'hockey-stick' graph, the warming gradient between maximum and minimum figures calculated from several sources is one of the steepest across the last two millennia. If generally drier, the new storm track is predicted to remain resolutely over the United Kingdom until *ca.* 2060 (Van Vliet et al. 2014) offering no respite from extreme weather events—just as it did in the sixth century. Since climatic conditions during the early middle ages offer the closest correspondence for our own times, the place-names coined by Anglo-Saxons to describe the English landscape under these conditions may suddenly have found new contemporary relevance.

OLD ENGLISH PLACE-NAMES AS INDICATORS OF PAST ENVIRONMENTAL CHARACTER AND CHANGE

In landscape terms, and read both spatially and temporally, Anglo-Saxon England was not monolithic. Distinct ecological zones emerged during the period as a consequence of both anthropogenic intervention and natural forces. Old English place-names marked out these zones, responding to their dynamic and changing character. The early medieval centuries proved formative for the English countryside. It was during this period that the basic distinction between open champion countryside versus woodland landscapes emerged. To an extent, this division still defines England and remains visible in the disposition of the fundamental landscape features that have come to characterize its regions.

On the ground, these two zones present as a tripartite division (Rackham 1986; Roberts and Wrathmell 2000; 2002) (Figure 5). The ancient or woodland
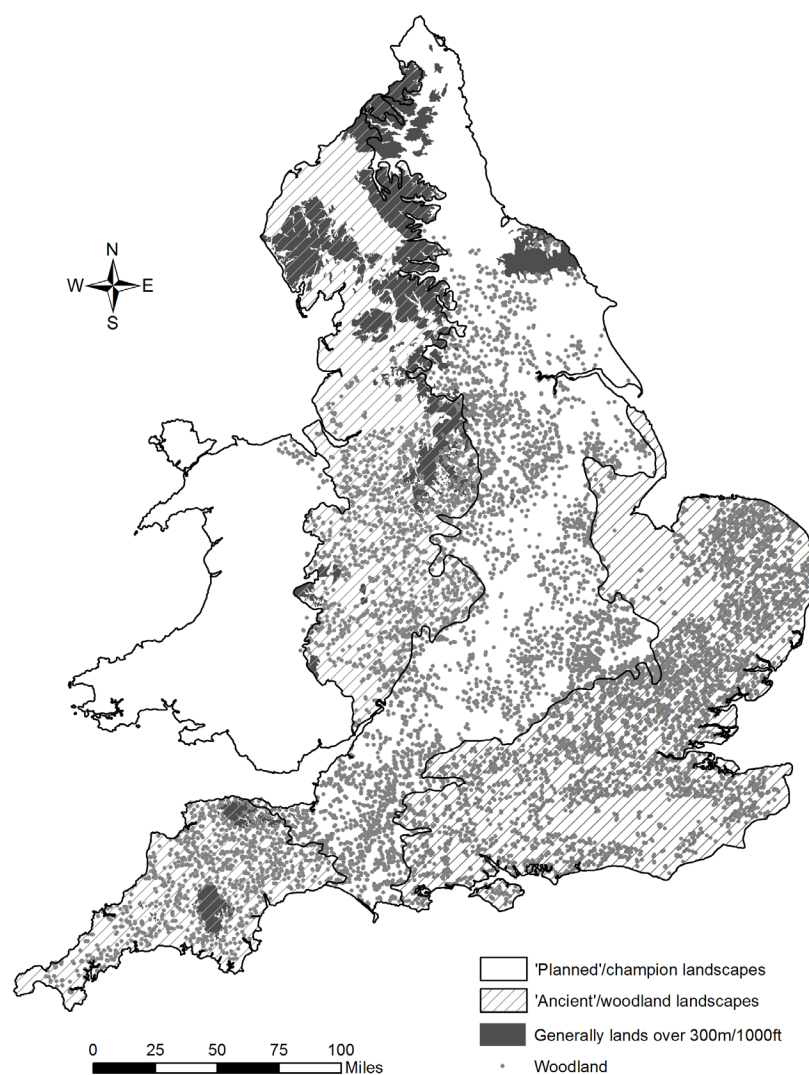

FIGURE 5. The extent of the ancient and the planned landscapes, mapped against evidence for woodland reconstructed taken from Old English place-names and Domesday Book. Based on Roberts and Wrathmell (2000), Figure 1.13

countryside—defined by more dispersed settlement patterns, pastoral economies, enclosed fields systems, more woodland, extensive commons and the greater survival of antecedent cultural landscape features— dominates the north and west of the country, and to a large degree the south-eastern counties. The planned or champion landscape, in contrast, runs in a broad swath from the southern counties of Dorset and Hampshire through the Midlands to take in those northern counties lying east of the Pennines. It was in this central belt of countryside that more nucleated settlements developed during the early medieval period, often associated with extensive open arable fields which left little space for woodland or pasture.

Old English woodland place-names (or their absence), together with the later evidence for woodland found in Domesday Book (1086 A.D.),

are perhaps the best indicators of the geographic reach of these two environments. They reveal too, the extent to which Anglo-Saxon land management practices, notably the clearance of trees, served to remodel and refine these natural ecosystems over time (Figure 5). The Old English woodland vocabulary was particularly rich—with more than one hundred terms for specific tree species as well as a range of words for woods of different sizes, ecological diversity, and location. These names also differentiated natural woodland from semi-natural or closely managed stands of trees (Figure 6; Watts 2004). In terms of the sheer breadth of the vocabulary available to place-namers to mark open and wooded spaces, and the ubiquitous and consistent application of these terms across the country, it is clear that woodland and its management was fundamental to Anglo-Saxon traditional ecological knowledge.
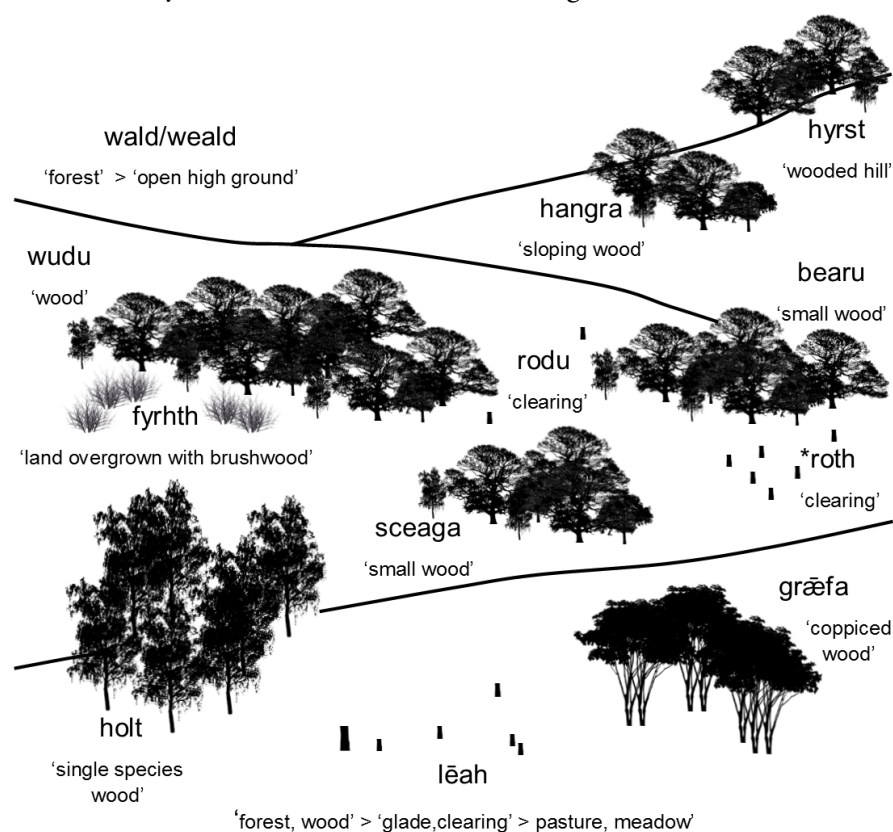
FIGURE 6. Woodland traditional ecological knowledge, depicting the location and nature of twelve of the most commonly used Old English elements in place-names referring to either the presence or clearance of woodland.

But if certain elements of traditional ecological knowledge were shared across the whole of Old English-speaking society, it is equally important to recognize the synchronic variations that manifested themselves on the ground. Open or wooded, upland or lowland, coastal or riverine—these distinctions and many other combinations, associations and oppositions, produced the kaleidoscopic array of local landscapes each with their own unique name assemblages revealed in the Anglo-Saxon charters. And it is important to note, too, diachronic variation within the traditional ecological knowledge vocabulary (Kronenfeld and Rundblad 2003). The meaning of particular terms could and did change over time in response to landscape change. Thus, two original woodland terms had, by the end of the early medieval period, come to denote open country, symptomatic of the extensive tree clearance undertaken by the Anglo-Saxons: **lēah** shifted over time from meaning 'forest, wood' to 'glade/clearing', and later still to 'pasture/meadow' (Gelling 1993; Gelling and Cole 2000: 237-42); while **wald/weald** turned from referring to extensive woodland (e.g., The Weald in Sussex and Kent) to mean open high ground (e.g the Cotswolds, Yorkshire Wolds, etc.). Nor were such shifts restricted to woodland. The term **burna**, initially applied to areas of marshland became, over time, restricted to small watercourses (Cole 1991). Thus, the natural dynamism and the human remodelling of the English landscape during the early medieval period finds reflection in the changing vocabulary used to describe it.

FROM PAST TO PRESENT: PLACE-NAMES, TRADITIONAL ECOLOGICAL KNOWLEDGE, AND MODERN FLOODING
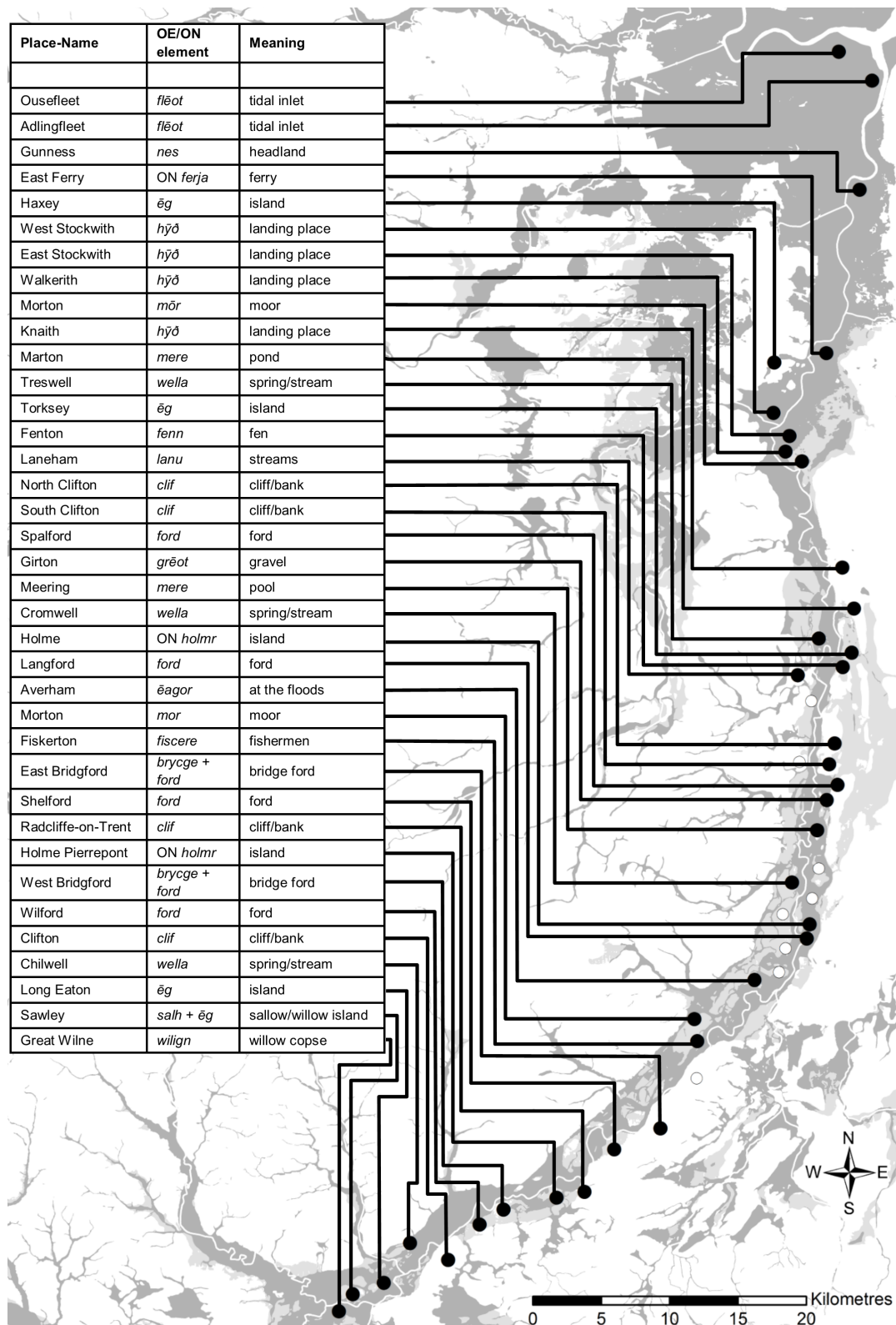
The environmental dimensions contained within Old English place-names have long been recognized (e.g., Gelling 1984), and their value for reconstructing historical landscapes often exploited. But rarely have they been recognized to carry value for the present. When viewed as a repository of traditional ecological knowledge, however, the opportunity arises to explore their potential in contemporary context. In 2013-14, flooding across large parts of England was especially widespread and severe. On the Somerset Levels, the village of Muchelney (Somerset) was entirely surrounded by flood waters, and all communication to the outside world cut off. Along the river Thames, hundreds of homes were inundated in the commuter town of Chertsey (Surrey). The river Wey burst its banks flooding Byfleet and Pyrford (Surrey). In the aftermath, newspapers reported that the villagers of Girton (Nottinghamshire) were calling for permanent flood defenses for their homes which were 'under constant threat of flooding' (*Newark Advertiser* 8.1.15). Countless similar cases could be cited. What catches the eye and prompts comment is that all of these names, each an Old English name coined in the early middle ages, signal in various ways the likely presence of water in these locations just as they were intended to do a millennium or more before: Chertsey (**Ceor(o)t** + ēg: 'Ceota's island'); Byfleet (***bi flēote**: '[settlement] by the river'); Pyrford (**pirigan** + **ford**: 'pear-tree ford'); Girton (**grēote** + **tūn**: 'gravel village or estate') (Watts 2004 *s.n.*). And in the case of Muchelney (**miclan** + īeg: 'big island'), the name appears to mark the return of the modern landscape to its earlier wetter Anglo-Saxon state.

It comes as no surprise to discover that many riverside settlements carry historic water-names (the density of such names is exemplified by those found along the lower reaches of the River Trent (Figure 7)), or that riverside places are prone to flooding because they continue to stand close to their often eponymous watercourses. But that their Old English names at times describe the modern hydrological characteristics of these locations so accurately is perhaps unexpected. Water, it would seem, is now behaving as it once did during the second half of the first millennium A.D.

Of all the topographic names in the Old English place-name corpus, those which describe water in all its states are the most numerous. Hundreds refer

| Place-Name	OE/ON element	Meaning
Ousefleet	*flēot*	tidal inlet
Adlingfleet	*flēot*	tidal inlet
Gunness	*nes*	headland
East Ferry	ON *ferja*	ferry
Haxey	*ēg*	island
West Stockwith	*hȳð*	landing place
East Stockwith	*hȳð*	landing place
Walkerith	*hȳð*	landing place
Morton	*mōr*	moor
Knaith	*hȳð*	landing place
Marton	*mere*	pond
Treswell	*wella*	spring/stream
Torksey	*ēg*	island
Fenton	*fenn*	fen
Laneham	*lanu*	streams
North Clifton	*clif*	cliff/bank
South Clifton	*clif*	cliff/bank
Spalford	*ford*	ford
Girton	*grēot*	gravel
Meering	*mere*	pool
Cromwell	*wella*	spring/stream
Holme	ON *holmr*	island
Langford	*ford*	ford
Averham	*ēagor*	at the floods
Morton	*mor*	moor
Fiskerton	*fiscere*	fishermen
East Bridgford	*brycge + ford*	bridge ford
Shelford	*ford*	ford
Radcliffe-on-Trent	*clif*	cliff/bank
Holme Pierrepont	ON *holmr*	island
West Bridgford	*brycge + ford*	bridge ford
Wilford	*ford*	ford
Clifton	*clif*	cliff/bank
Chilwell	*wella*	spring/stream
Long Eaton	*ēg*	island
Sawley	*salh + ēg*	sallow/willow island
Great Wilne	*wilign*	willow copse

FIGURE 7. Water-names found along the lower reaches of the River Trent. Grey shading identifies the extent of the floodplain and areas now identified as at risk from flooding. OE = Old English; ON = Old Norse.
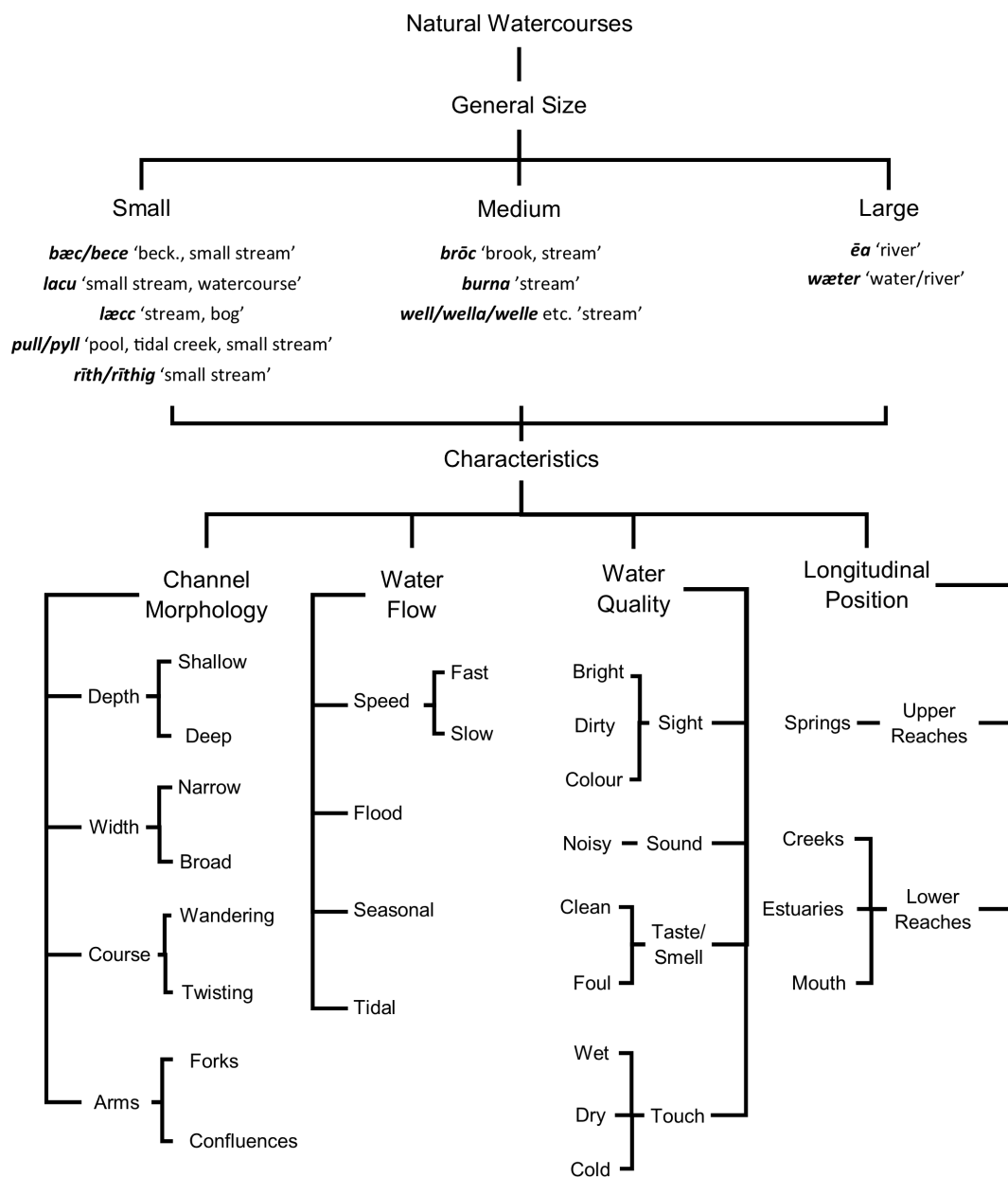
FIGURE 8. Hydrological information relating to flowing water contained within Old English place-names.

either directly or indirectly to the presence, behaviour and characteristics of water. Together they describe the hydrology of the Anglo-Saxon landscape in detail (Figure 8). Several names warn explicitly of the danger of flood such as Averham (Nottinghamshire: ēagor: '[settlement] at the floods') and Broadwas (Worcestershire: **brād** + *****wæsse**: 'broad alluvial land that floods and drains quickly'). An Anglo-Saxon charter boundary clause that survives for the latter demonstrates the attention the Anglo-Saxons paid to water in this precarious environment (Figure 9: S126; Hooke 1990: 87-90; Gelling and Cole 2000: 63-4). When the historical evidence is mapped against current flood risk maps, it is clear that water still remains a problem here. But the Anglo-Saxons were wise enough to locate their settlement just above
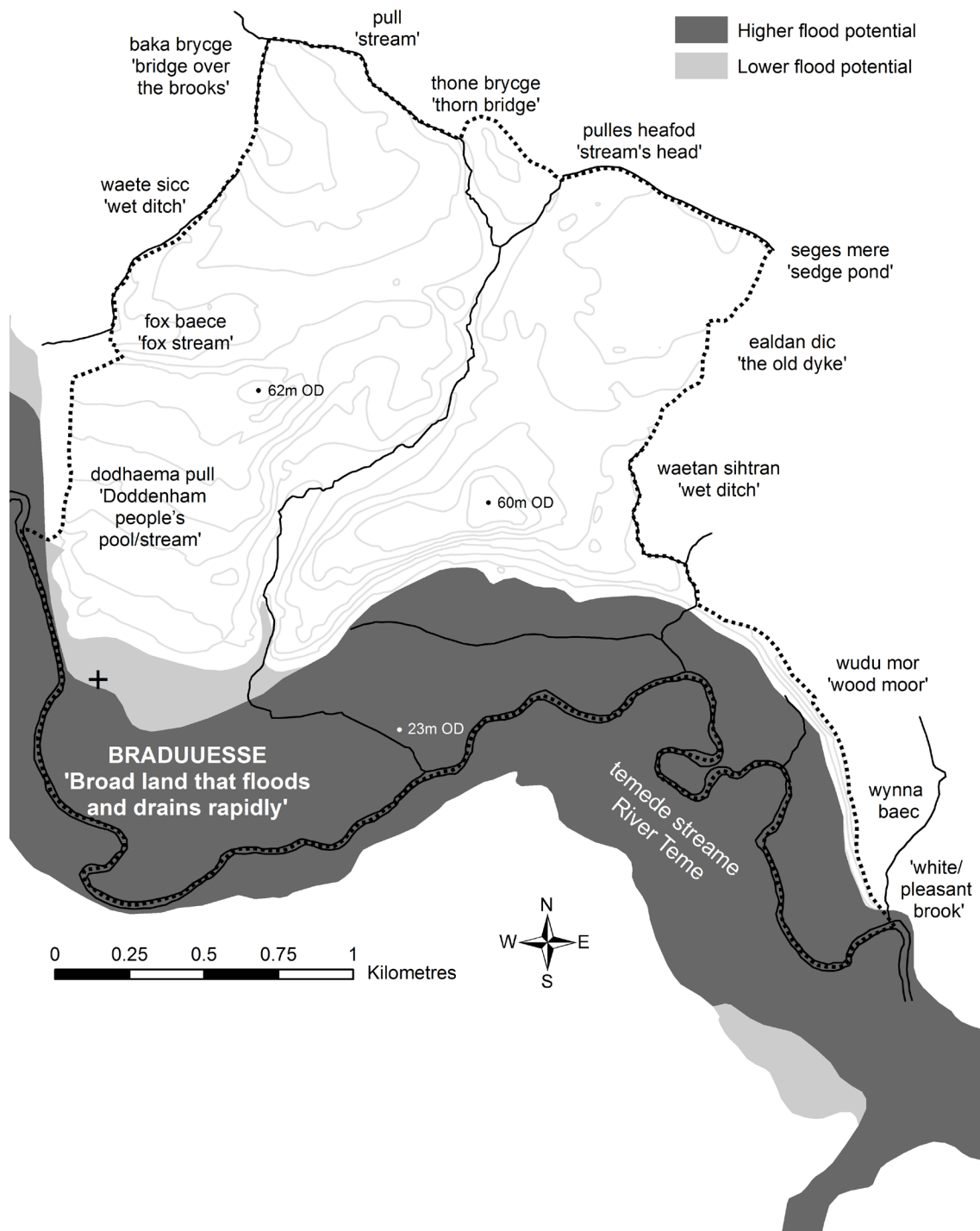
FIGURE 9. Water features described on the boundary of the estate of Broadwas (Worcestershire). The charter itself, dated 779x790 A.D. is thought to be a forgery. However, the boundary description looks genuine— though is likely to reflect the landscape at a slightly later date than suggested by the charter. Map adapted from Hooke (1990).

the floodplain rather than on it as is the case today, a cautionary example that today's developers may wish to remember. Those responsible for planning for the future might also take note of place-names elsewhere which signal shallowing beds and narrowing channels that point more indirectly than names in **–wæsse** towards high flood risk areas which might need further defence or intervention.

Nor does the value of Old English water names end there. Many describe the former meandering courses of rivers now canalized. Since meanders help to slow flow rates and thus reduce the threat of downstream flooding Old English place-names might be drawn upon to recreate more natural watercourses in order to undo problems caused by channel straightening undertaken in the last few centuries. Thus, England's old water-names, it would seem, hold high potential to contribute to finding practical solutions to flood abatement, control and alleviation in a number of ways. But they are not the only traditional ecological knowledge-laden place-names that can be marshalled in pursuit of that end.

The positive effect of reforestation, which intercepts water before it enters river-systems, is now widely recognized as one of the most effective natural flood alleviation measures (e.g., Calder and Aylward 2006; Laurance 2007). As seen, hundreds of Old English place-names indicate the former presence of trees, many of which have now disappeared. Indeed, it was the Anglo-Saxons themselves who were responsible for much of this clearance (Figures 5 and 6). It appears that the climatic changes witnessed during the early medieval centuries coincided with, and indeed perhaps prompted, this significant episode of anthropogenic landscape change which is captured in the sematic shift of terms such as **lēah** and **wald/ weald**. Over large parts of England, trees were felled and land was given over to cereal cultivation. In those areas that saw the introduction of open-field farming, the lack of tree cover and hedgerows encouraged soil erosion and surface water run-off, exacerbating the risk of flood (Robinson and Lambrick 1984). But if the modern problem of flooding is in part a legacy

of Anglo-Saxon land-management strategies, the Old English place-names which they have left us, and which record these activities, may offer a solution.

One river catchment might stand as illustration. The river Erewash, a relatively minor tributary of the river Trent, acts for the majority of its seventeen-mile course as the county boundary between Nottinghamshire and Derbyshire (Figure 10). Early forms of the river-name, first recorded as **Irewys**, suggest that it was probably formed from Old English **ire** 'wandering' and a derivative of Old English **wisce** 'wet meadow' giving the sense 'meandering stream' (Ekwall 1928, 148-9). Over time, and presumably prompted by its propensity to overbank, its second element was replaced by Old English **(ge)wæsse** 'a washing, a flood' (Watts 2004, *s.n.*). Extensive alluvial deposits along its course testify to its flooding potential, particularly so at its confluence with the Trent. The shift of emphasis hinted at by the name change seems to indicate a significant modification in the river's behavior—from relatively tranquil to more unpredictable and dangerous. This altered state may find its origins in the extensive woodland clearance that occurred within its catchment, the evidence for which is recorded in the place-names of the Erewash watershed. No fewer than fifteen major place-names contain the Old English element **lēah**.

If there is a correlation here between deforestation and increased risk of flooding, then the reconstitution of the earliest medieval landscape, made possible by the traditional ecological knowledge preserved in existing place-names, may offer a potential template that would allow the current flood threat to be reverse engineered. Might replanting trees where they were cleared a thousand years ago, or reconstituting wetlands where Old English place-names indicate their location, return the Erewash to its more benign early state? If so, comparable maps which can be drawn for all of England's river catchments may well help to harness the forgotten traditional ecological knowledge embedded in Old English place-names, providing a vital new perspective on landscape management at a
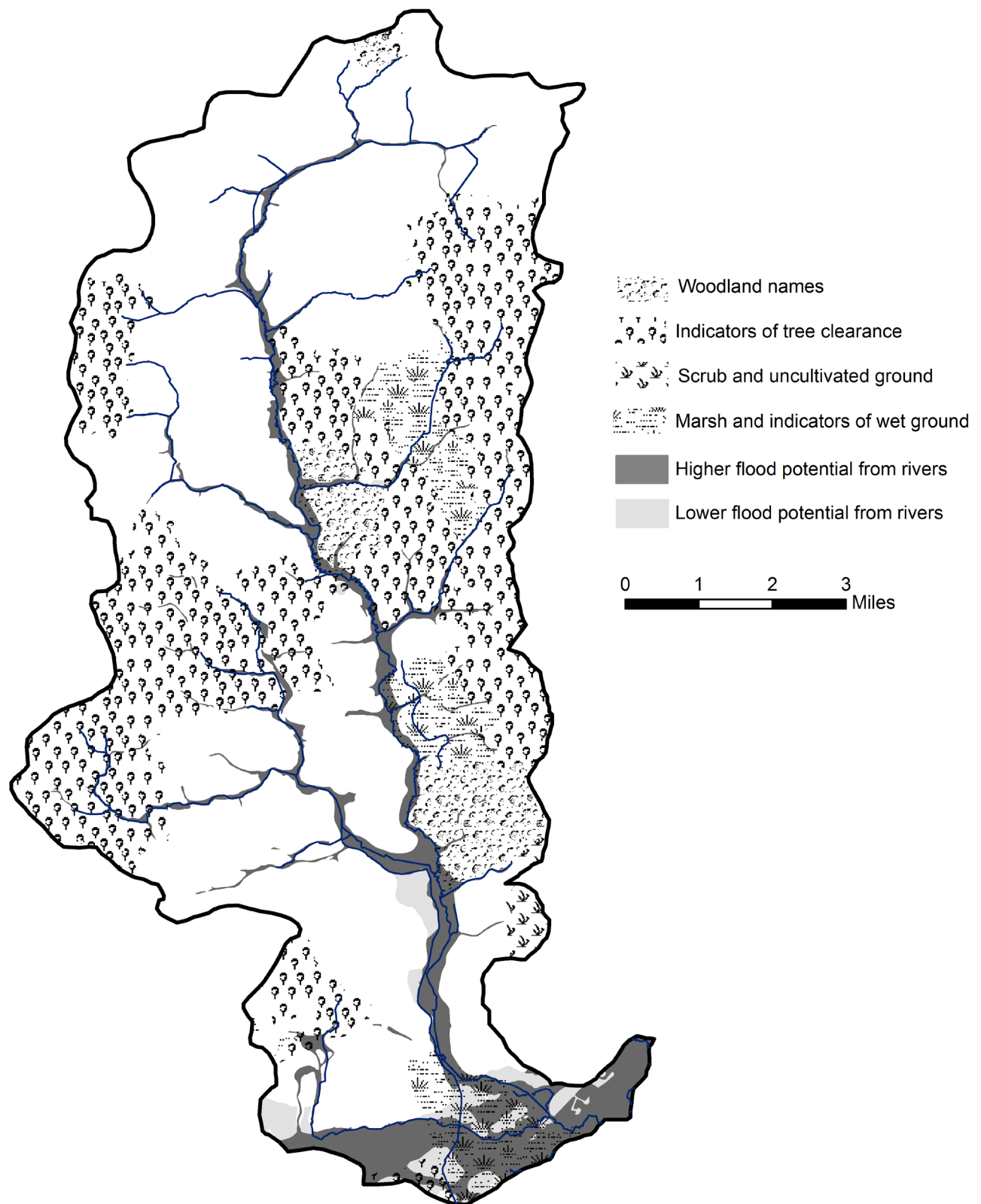
FIGURE 10. Environmental indicators from Old English place-names in the river Erewash catchment.

watershed scale that might help us to move away from our current reliance on technological and engineering solutions and towards more natural solutions for the current flooding threat.

CONCLUSION

In their form, semantic range, and application, Old English place-names bear all the hallmarks of traditional ecological knowledge names found in other parts of the world where they are most closely associated with indigenous, aboriginal, and First Nations communities. The ramifications which flow from this observation are arguably profound. For toponymists, it offers a new way of approaching their data. It brings into question their current classification of names using oppositional categories such as habitative (cultural) or topographical (natural). Seeing Old English place-names as traditional ecological knowledge-names brings us into better alignment with the worldviews of those who named the English landscape and who sought to make sense of it. It encourages a more holistic approach to understanding how all these names operated *together* rather than in *isolation* to map out the Anglo-Saxon world. If new historical insights will emerge from examining Old English place-names through a traditional ecological knowledge lens, the value of these place-names or the applications which might derive from them do not end there. By recognizing the traditional ecological knowledge that they contain, a substantial body of ecological information, which we have lived with but which we have hitherto not exploited, becomes available to us once more. Seen in this way, the Old English place-names of England appears to hold the potential to inform and guide current and future approaches to some of the greatest environmental challenges we face today. Here the value of water and woodland names in combatting United Kingdom flooding has been highlighted. But further applications might be envisaged including informing future food and energy production strategies and environmental management programs. Nor need such approaches be necessarily restricted to the United Kingdom. Embedded in historic place-names across the developed world is a wealth of environmental and ecological information simply waiting to be re-acknowledged and applied as appropriate to local circumstances.

Richard L.C. Jones, *Centre for English Local History, University of Leicester*, rlcj1@le.ac.uk

ACKNOWLEDGEMENTS

REFERENCES CITED

Altman, H.M.

2006   *Eastern Cherokee fishing*. Tuscaloosa, AL: University of Alabama Press.

Aybes, C., and D.W. Yalden.

1995   Place-name evidence for the former distribution and status of wolves and beavers in Britain. *Mammal Review* 25(4):201-226. http://dx.doi.org/10.1111/j.1365-2907.1995.tb00444.x

Berkes, F.

1999   *Sacred ecology: Traditional ecological knowledge and resource management.* London: Taylor and Francis.

Blackstock, M.

2001   *Faces in the forest: First nation's art created in living trees*. Montreal, Canada: McGill-Queen's University Press.

BOILLAT, S., E. SERRANO, S. RIST, AND F. BERKES.

2013   The importance of place names in the search for ecosystem-like concepts in indigenous societies: An example from the Bolivian Andes. *Environment Management* 51(3):663-678. http://dx.doi.org/10.1007/s00267-012-9969-4

CALDER, I.R., AND B. AYLWARD.

2006   Forest and floods: Moving to an evidence-based approach to watershed and integrated flood management. *Water International* 31(1):87-99. http://dx.doi.org/10.1080/02508060608691918

CANTWELL, I.

2000   *Climate in medieval Ireland AD500-1600.* Unpublished MSc thesis, Queen's University Belfast.

COATES, R.

2012   "Agricultural compound terms and names in *tūn* like *Acton* and *Barton*," in *Sense of place in Anglo-Saxon England.* Edited by R. Jones and S. Semple, pp. 211-237. Donington: Shaun Tyas.

COLE, A.

1991   *Burna* and *brōc*: Problems involved in retrieving the Old English usage of these place-name elements. *Journal of the English Place-Name Society* 23:26-48.

COLE, A.

2007   "The place-name evidence for water transport in early medieval England," in *Waterways and canal-building in medieval England.* Edited by J. Blair, pp. 55-84. Oxford, United Kingdom: Oxford University Press.

COLE, A.

2012   "*Tūn*s by the wayside," in *Sense of place in Anglo-Saxon England.* Edited by R. Jones and S. Semple, pp. 243-259. Donington, United Kingdom: Shaun Tyas.

COMMITTEE ON CLIMATE CHANGE.

2016   *UK climate change risk assessment 2017.* London: Committee on Climate Change.

COX, B.

1975-76 The place-names of the earliest English records. *Journal of the English Place-Name Society* 8:12-66.

DAVIDSON-HUNT, I., AND F. BERKES.

2002   Learning as you journey: Anishinaabe perception of social-ecological environments and adaptive learning. *Ecology and Society* 8(1):#5.

EKWALL, E.

1928   *English river-names.* Oxford, United Kingdom: Clarendon Press.

FAIR, S.W.

1997   Inupiat naming and community history: The Tapqaq and Saninq coasts near Sheishmaref, Alaska. *The Professional Geographer* 49(4):466-480. http://dx.doi.org/10.1111/0033-0124.00093

FINBERG, H.P.R.

1964   "Charltons and Carltons," in *Lucerna: Studies of some problems in the early history of England.* By H.P.R. Finberg, 144-160. London: Macmillan.

Fox, H.S.A.

2008   "Butter place-names and transhumance,"
        in *A commodity of good names: Essays in
        honour of Margaret Gelling*. Edited by
        O.J. Padel and D.N. Parsons, pp. 352-
        364. Donington, United Kingdom:
        Shaun Tyas.

Gelling, M.

1978   *Signposts to the past: Place-names and the
        history of England*. Chichester, United
        Kingdom: Phillimore.

Gelling, M.

1993   *Place-names in the landscape: The
        geographical roots of Britain's place-names*.
        London: J.M. Dent.

Gelling, M., and A. Cole.

2000   *The landscape of place-names*. Stamford:
        Shaun Tyas.

Hall, A.

2006   Are there any elves in Anglo-Saxon place-
        names? *Nomina* 29:61-80.

Hercus, L., F. Hodges, and J. Simpson, eds.

2002   *The land is a map: Placenames of
        indigenous origin in Australia*. Canberra,
        Australia: Pandamus Books.

Hooke, D.

1990   *Worcestershire Anglo-Saxon charter-bounds*.
        Woodbridge, United Kingdom: Boydell
        Press.

Hooke, D.

1999   *Warwickshire Anglo-Saxon charter-bounds*.
        Woodbridge, United Kingdom: Boydell
        Press.

Hooke, D.

2010   *Trees in Anglo-Saxon England: Literature,
        lore, and landscape*. Woodbridge, United
        Kingdom: Boydell Press.

Hough, C.

1997-8 Place-name evidence for Old English
        bird-names. *Journal of the English Place-
        Name Society* 30:60-76.

Hough, C.

2013   "Women in place-names," in *Perceptions
        of place: Twenty-first-century interpretations
        of English place-name studies*. Edited by J.
        Carroll and D.N. Parsons, pp. 251-282.
        Nottingham, United Kingdom: English
        Place-Name Society.

Inglis, J.T., ed.

1993   *Traditional ecological knowledge: Concepts
        and cases*. Ottawa, Ontario: Canadian
        Museum of Nature.

Inuit Heritage Trust.

2013   Projects: Place names. Accessed
        September 28, 2016 at http://www.ihti.
        ca/eng/iht-proj-plac.html.

Insley, J.

2013   "Personal names in place-names," in
        *Perceptions of place: Twenty-first-century
        interpretations of English place-name
        studies*. Edited by J. Carroll and D.N.
        Parsons, pp. 209-250. Nottingham,
        United Kingdom: English Place-Name
        Society.

Johnson, L.M.

2010   *Trail of story, traveller's path: Reflections in
        ethnoecology and landscape*. Edmonton,
        Canada: Athabasca University Press.

JONES, R.

2013   *The medieval natural world*. Farnham: Longman Pearson.

JONES, R.

2016   "Names and archaeology," in *The Oxford handbook of names and naming*. Edited by C. Hough, pp. 467-475. Oxford, United Kingdom: Oxford University Press.

KHARUSI, N.S., AND A. SALMAN.

2015   In search of water: Hydrological terms in Oman's toponyms. *Names* 63(1):16-29. http://dx.doi.org/10.1179/0027773814Z.00000000094

KOCH, H., AND L. HERCUS.

2009   *Aboriginal placenames: Names and re-naming the Australian landscape*. Canberra, Australia: Australian National University.

KRONENFELD, D., AND G. RUNDBLAD.

2002   "The semantic structure of lexical fields: Variation and change," in *Words in time: Diachronic semantics from different points of view*, pp. 67-114. Berlin: De Gruyter Mouton.

LAURANCE, W.F.

2007   Environmental science: Forests and floods. *Nature* 449(7161):409-410. http://dx.doi.org/10.1038/449409a

LEFALE, P.H.

2010   *Ua 'afa le aso* stormy weather today: Traditional ecological knowledge of weather and climate. The Samoa experience. *Climate Change* 100(2):317-335. http://dx.doi.org/10.1007/s10584-009-9722-z

LINDERHOLM, H.W., AND B.E. GUNNARSON.

2005   Summer temperature variability in central Scandinavia during the last 3600 years. *Geografiska Annales* 87A(1):231-241. http://dx.doi.org/10.1111/j.0435-3676.2005.00255.x

MANN, M.E.

2014   *The hockey stick and the climate wars: Dispatches from the front line*. New York: Columbia University Press.

MANN, M.E., R.S. BRADLEY, AND M.K. HUGHES.

1999   Northern hemisphere temperatures during the past millennium: Inferences, uncertainties, and limitations. *Geophysical Research Letters* 26(6):759-762. http://dx.doi.org/10.1029/1999GL900070

MANN, M.E., AND P.D. JONES.

2003   Global surface temperatures over the past two millennia. *Geophysical Research Letters* 30(15):#1820.

MARSH, T.J., AND J. HANNAFORD.

2007   *The summer 2007 floods in England and Wales—A hydrological appraisal*. Wallingford, United Kingdom: NERC/Centre for Ecology and Hydrology.

MCINTYRE, S., AND R. MCKITRICK.

2009   Proxy inconsistency and other problems in millennial paleoclimate reconstructions. *Proceedings of the National Academies of Science USA* 106(6):E10. http://dx.doi.org/10.1073/pnas.0812509106

Parsons, D.N.

2013   "Churls and athelings, kings and reeves: Some reflections on place-names and early English society," in *Perceptions of place: Twenty-first-century interpretations of English place-name studies*. Edited by J. Carroll and D.N. Parsons, pp. 43-74. Nottingham, United Kingdom: English Place-Name Society.

Rackham, O.

1986   *The history of the countryside*. London: Phoenix.

Riedlinger, D., and F. Berkes.

2001   Contributions to traditional knowledge to understanding climate change in the Canadian Artic. *Polar Record* 37(203):315-328. http://dx.doi.org/10.1017/S0032247400017058

Rippon, S., C. Smart, and B. Pears.

2015   *Fields of Britannia: Continuity and change in the late Roman and early medieval landscape*. Oxford, United Kingdom: Oxford University Press.

Roberts, B., and S. Wrathmell.

2000   *An atlas of rural settlement in England*. London: English Heritage.

Roberts, B., and S. Wrathmell.

2002   *Region and place: A study of English rural settlement*. London: English Heritage.

Robinson, M.A., and G.H. Lambrick.

1984   Holocene alluviation and hydrology in the Upper Thames basin. *Nature* 308(5962):809-14. http://dx.doi.org/10.1038/308809a0

Semple, S.

1998   A fear of the past: The place of the prehistoric burial mound in the ideology of middle and later Anglo-Saxon England. *World Archaeology* 30(1):109-126. http://dx.doi.org/10.1080/00438243.1998.9980400

Semple, S.

2007   Defining the OE *hearg*: A preliminary archaeological and topographic examination of *hearg* place-names and their hinterlands. *Early Medieval Europe* 15(4):364-385. http://dx.doi.org/10.1111/j.1468-0254.2007.00212.x

Si, A.

2016   *The traditional ecological knowledge of the Solega: A linguistic approach*. London: Springer. http://dx.doi.org/10.1007/978-3-319-24681-9

Sommerseth, I.

2011   Archaeology and the debate on the transition from reindeer hunting to pastoralism. *Rangifer* 31(1):111-127. http://dx.doi.org/10.7557/2.31.1.2033

Tent, J., and D. Blair.

2011   Motivations for naming: The development of a toponymic typology for Australian placenames. *Names* 59(2):67-89. http://dx.doi.org/10.1179/002777311X12976826704000

Thorne, C.

2014   Geographies of UK flooding in 2013/4. *Geographical Journal* 180(4):297-309. http://dx.doi.org/10.1111/geoj.12122

THORNTON, T.F.

1997   Anthropological studies of Native
        American place naming. *American Indian
        Quarterly* 21(2):209-228. http://dx.doi.
        org/10.2307/1185645

TUNSTALL, C.M., C.L. JOHNSON, AND E.C.
PENNING ROWSELL.

2004   Flood hazard management in England
        and Wales: From land drainage to flood
        risk management *World Congress on
        Natural Disaster Mitigation* 14(2):447-54.

VAN VLIET, B., A. PENAUD, A. HÉNAFF, C.
DELACOURT, A. FERNANE, J. GOSLIN, B.
HALLÉNGOUËT, AND E. LE CORNEC.

2014   Middle- and late-Holocene storminess
        in Brittany (NW France): Part II---The
        chronology of events and climate forcing.
        The Holocene 24(4):434-463. http://
        dx.doi.org/10.1177/0959683613519688

WATTS, V.

2004   *The Cambridge dictionary of English place-
        names.* Cambridge, United Kingdom:
        Cambridge University Press.