

# THE IRVINE ATLAS

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## A Note from the Editors

We are very pleased to present the inaugural issue of *The Irvine Atlas*. Last October 2018, about a dozen students gathered tentatively in room 310 of the Irvine building. Beckoned (and only beckoned – we have had little input from these two mentors since) by Dr Dan Clayton and Dr Matt Sothern, we were invited to attempt to revive STAG, the long-dormant St Andrews Undergraduate Geography Journal. What followed were weekly editorial board meetings consisting of confused but nonetheless excited discussions of how, exactly, to go about *making* an undergraduate geography journal. Although there have been countless small disputes, we commonly agreed on our missions: to create a platform that would showcase and archive the excellent work of SGSD students; to inspire our peers to work creatively and join us in this exercise; to integrate all levels of university learning; to ensure accessibility and legitimise different displays of knowledge. Meetings took place between classes on Monday or Tuesday afternoons in the main library study room 5, in the Lapworth Lab, and in the Golf Museum, Union, and Library cafes.

A bit about our *process*. Although we did want to maintain an egalitarian spread of power amongst all on the editorial board, we found defined roles and power structures necessary – Gabby and Iga, then, stepped into the roles of Editors-in-Chief. Section editors were selected to keep an eye on submissions that pertained to Human geography (Fiona and Chris), Physical geography (Conner and Eleri), and Sustainable Development (Noah and Nick). As much as we'd all love to subvert disciplinary categorisation, we found that practically, we needed section editors. In October, our hardworking publicity team with secretary-treasurer Carys sent out an email calling for submissions from St Andrews students to submit to the journal. Again, our goal was integration: we called for work from any year level and any degree programme, only asking that the submissions had a geographical or sustainable element. This is clearly evident within the pages of this journal, wherein one will find lying side-by-side articles pertaining to a myriad of subjects: volcanoes; the gendered geography of the body; the Black Plague; Highland grouse moors; feminist methodologies. We classify all of these pieces as legitimate Geography.

Perhaps the most jarring attribute of this journal is that it is peer-reviewed! Each piece has been reviewed by at least three “peers”: undergraduates whom were sourced by the editorial board that had an interest in an article's subject. 27 individual students associated with SGSD took part to anonymously peer-review the submissions. To them we would like to offer a hearty thank-you. After being reviewed, the marked-up articles were returned to each author, whom were invited to integrate and/or dispute the readers' comments and resubmit to the journal. From there the articles were either accepted or sent back for further revision. Finally, the pieces were copy-edited by our dedicated editorial board over a 5-hour period just two Mondays ago.

Our editorial board consists of many different viewpoints, epistemologies and methodologies. Our two editors-in-chief lie at opposite ends of the epistemological spectrum (we're talking neo-Foucauldian post-structuralist and positivist here). Within these productive tensions has arisen creative, fun, and rigorous undergraduate geography. Working with such a young, ambitious, creative, and determined editorial team was a big responsibility and a challenge, but also an amazing adventure for both of us. To our wonderful editorial board: Abbie, Carys, Charlotte, Christopher, Conner, Eleri, Fiona, Imogen, Joanna, Lara, Lottie, Nick, Noah, Sophie, Zule – thank you for all of your hard work and we are so proud of you.

We would like to thank Dr Matt Sothern and Dr Dan Clayton for their support and suggestions. Also, we thank Graeme Sandeman for his help uploading this issue online. Our gratitude goes out as well to the SGSD office staff, who have put up with countless requests on our behalf. Heartfelt thanks also to the Print and Design Office for their immense help and patience. Finally, we would like to thank Professor Elspeth Graham and Professor Colin Ballantyne for sitting down with us for the interviews included in our features section.

We hope you enjoy this inaugural edition of *The Irvine Atlas*,

Iga Józefiak and Gabrielle Wolf

Editors-in-chief

February 2019



# Volcanic Hazards in the Sea-to-Sky Corridor, BC Canada

Conner Morison, Fourth Year Geography

**Abstract** — Canada's western seaboard is situated above a subduction zone; specifically, the area where the (denser) oceanic Juan de Fuca plate is sinking below the continental North American plate. The Cascades are a volcanic arc which have been constructed a few hundred kilometres inboard of this offshore subduction zone. In the USA, volcanic eruptions are both more frequently occurring and better constrained in time than in Canada. Workers in the last few decades have bracketed the age of the last eruption at Mount Garibaldi to ~10,650-9,360 years BP by means of radiocarbon ( $^{14}\text{C}$ ) dating organic deposits growing during the emplacement of the Ring Creek lava flow. This follows visual evidence that the last eruptions took place in the early Holocene during the retreat of the last Cordilleran Ice Sheet. As there can be no hazard without people to render physical earth processes dangerous, it is an emerging area of research to consider societal perception and awareness of hazards. Future research on long-dormant volcanoes, such as the Canadian Cascades, should also consider societal vulnerability as an integral part of natural hazard studies.

Canada's western seaboard is situated on the *Pacific Ring of Fire*; that is to say the volcanic margins of the Pacific tectonic plate. Volcanic activity is a well-researched phenomenon in Alaska and the USA proper, however there is a stark hiatus of both frequent activity and comprehensive understanding of volcanic risk in Canada. Highway 99 connects Vancouver to Hat Creek via Squamish, Whistler and Lillooet. The 120 km long stretch of this highway between Vancouver and the ski resort of Whistler Blackcomb is termed the *Sea-to-Sky* Highway. Approximately 40 km of this route (and the industrial/residential corridor which follows it) are exposed to potential volcanic hazards. The landscape of the Sea-to-Sky Corridor is a testament to volcanism; subsequently sculpted both glacially and fluvially, and most recently developed for industry and recreation. There is a myriad of volcanic hazards which could manifest at this volcano, including ash fall, lava flows, pyroclastic density currents, jökulhlaup & landslides. A scarcity of volcanological research has been recognised in Canada. This has prevented the publication of an exhaustive risk assessment here (Stasiuk *et al.*, 2003). In any case, because the last *known* eruption occurred millennia ago, the propagation of error in any spatial or temporal analysis may outweigh the credibility of any

findings. This short paper briefly sketches the background literature in this area of research.

*"It is a sobering observation that long repose is usually associated with the silicic volcanism of subduction zones, and these belts often coincide with major population clusters."*  
(Chester, 2005)

Mt Garibaldi is a long-dormant member of the Cascades, a chain of stratovolcanoes resulting from the subduction of the oceanic Juan de Fuca tectonic plate underneath the continental North American plate. The volcano is one of a belt of four volcanoes: Garibaldi, Cayley, Meager & Silverthorne (Stasiuk *et al.*, 2003). All four have a history of violent, pyroclastic eruptions during the Quaternary as well as some more recent effusive activity (Green, 1990a). As a reminder of their instability, there have been catastrophic rock-slope failures from these peaks in the very recent geological past, such as at Garibaldi's Rubble Creek in 1855 (Moore & Mathews, 1978), and the Cheekye River (Friele & Clague, 2005; Jakob & Friele, 2010). The Rubble Creek hazard is still widely publicised in the local media (Squamish Chief, 2015; Pique News Magazine, 2017). The aforementioned characteristics display similarity with the more active Cascades in the USA, such as Mt St Helens & Mt Hood.

As the emplacement of the Ring Creek lava flow effectively split the drainage of the Mamquam River into two, radiocarbon ( $^{14}\text{C}$ ) dating of woody deposits in a delta formed by the new river (near the front of the lava) yields a maximum age of  $10,650 \pm 70$  years BP. A minimum age of  $9360 \pm 160$  years BP is provided by charcoal in another delta (about half way up the lava flow). This constrains the time of the last eruption to roughly 8700-7400BC (Brooks & Friele, 1992). There is no geological evidence to suggest that the Ring Creek flow encountered any ice on its journey downhill, which has led to the assumption that it was erupted *after* the Cordilleran ice sheet had retreated from the Howe Sound. It is thought that the age of the Barrier and Culliton Creek flows are older, though not substantially older. Although the Barrier flow was evidently dammed by ice in the valley, it was not impeded by ice at higher altitudes (Green, 1990b). Since the Cordilleran ice sheet retreated, the Barrier flow has been



collapsing incrementally into Rubble Creek (Moore & Mathews, 1978).

There is no evidence to suggest that the volcano will erupt in the near future. However, high magnitude earthquakes can trigger activity (Linde & Sacks, 1998). The last catastrophic movement on the Cascadia subduction zone was in 1700. As such, the western seaboard will likely experience another magnitude >8 earthquake when over three hundred years' tension is released. Whilst the tsunami threat is well documented (Clague *et al.*, 2003), the possibility that a sudden change in stress regime could re-energise volcanism is only posited by Kenneth Chamberlin's (2016) documentary fiction *Megathrust*. This volcano has a track record of being activated by external influences, such as by a rapid cryostatic unloading after the last glacial maximum; this may have triggered the last eruption (Mathews, 1990).



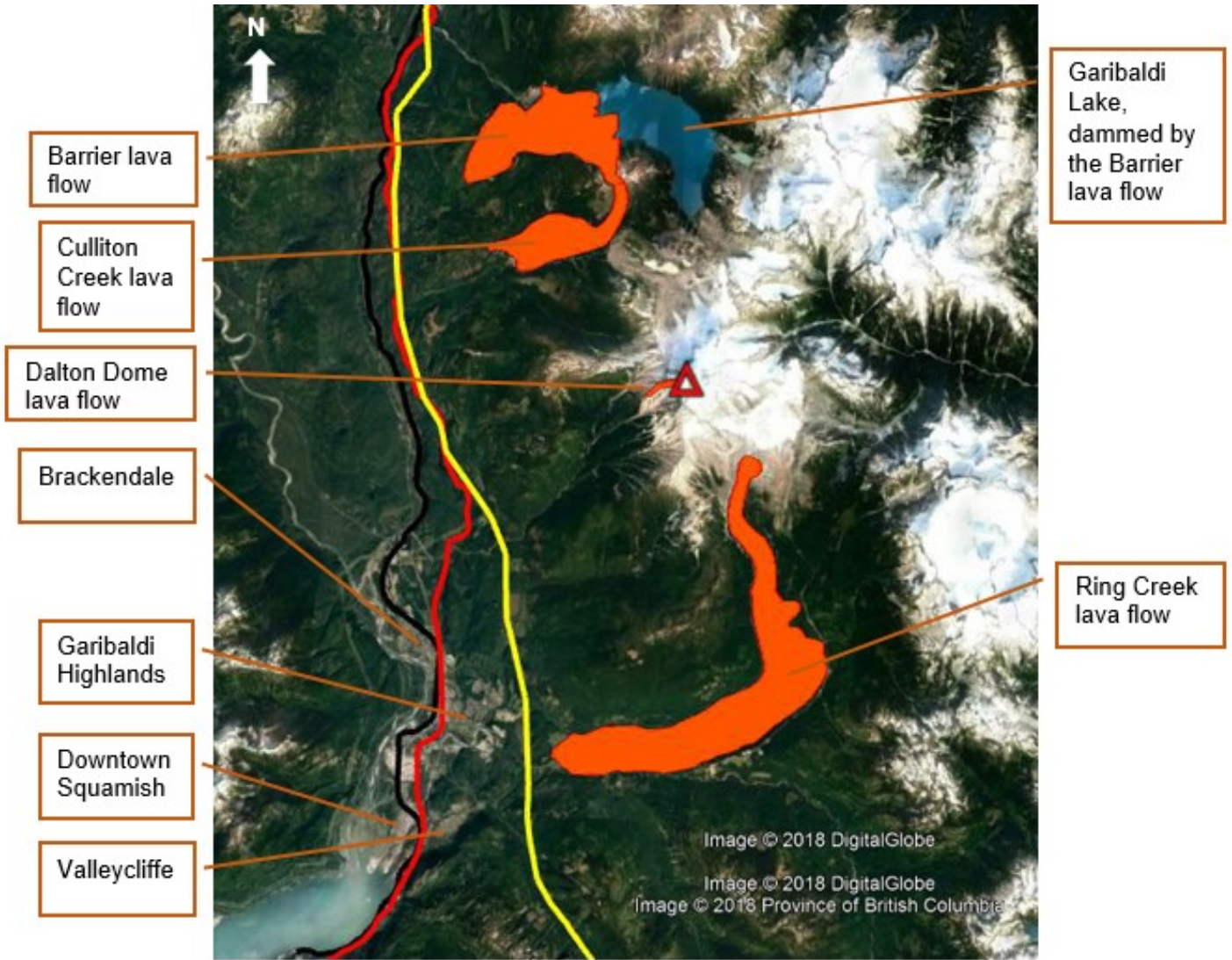
Figure 1: Mount Garibaldi, viewed from the Ring Creek Lava flow to the south. Source: (Morison, 2018).

*"No volcanic disaster has been recorded in Canada, making it necessary to demonstrate that volcanic hazards are a societal concern"* (Stasiuk *et al.*, 2003).

As there can be no hazard without people to render processes dangerous, it is an emerging area of research to consider societal prioritisation, awareness and vulnerability as integral parts of natural hazard studies (e.g. Susman *et al.*, 1983; Stefanovic, 2003; Ferrier & Haque, 2003; Doyle *et al.*, 2014; Barclay *et al.*, 2015). Risk perception is governed by several behaviours detailed in Barclay *et al.* (2015). These can stem from cultural, religious or societal roots. Assessing the perception displayed by a population to a volcanic hazard has been researched for more active volcanoes, such as amongst visitors to Katla in Iceland (Bird *et al.*, 2010) and in the red zone around Vesuvius in Italy (Barberi *et al.*, 2008). In the case of Canada, the

Squamish Emergency Program (2015) provides a limited outline of a volcanic hazard in the area - yet it places the community at *moderate* risk for volcanism in its risk matrix. However, if hazards have return periodicity on the order of millennia, it is unlikely that mitigation efforts are economically worthwhile. More quantitative risk matrices which plot eruption frequency against impact can produce more numerically grounded threat levels (Aspinall & Blong, 2015).

Forthcoming work on this topic should aim to reconstruct the dynamics of the most recent lava flows from Mount Garibaldi, evaluating if these pose any societal hazard if they were to happen today. Modelling of a hypothetical lava flow, using standard and defined parameters specific to the volcanic setting, could be used to identify societal hazards under different scenarios. Fieldwork could also be undertaken to survey volcanic risk perception in the town of Squamish, with the intention of harmonising human and physical research methods to determine if the Sea-to-Sky Corridor is vulnerable to future volcanic activity.



Satellite image: Google Earth (2016)

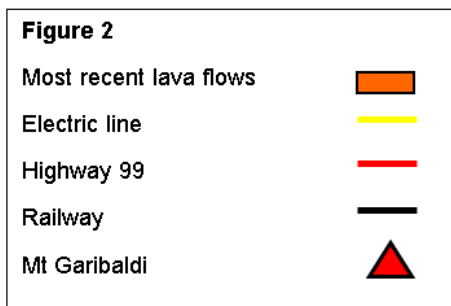


Figure 2: Map of Mount Garibaldi and surrounding area showing recent lava flows. Source: (Morison, 2018).

## REFERENCES

- Aspinall W & Blong R (2015), *Volcanic Risk Assessment*, Encyclopaedia of Volcanoes, 1215-1231, Elsevier.
- Barberi F, Davis M, Isaia R, Nave R & Ricci T (2008), *Volcanic Risk Perception in the Vesuvius Population*, Journal of Volcanology & Geothermal Research 172, 244-258, Elsevier.
- Barclay J, Haynes K, Houghton B & Johnston D (2015), *Social Processes & Volcanic Risk Reduction*, Encyclopaedia of Volcanoes, 1203-1214, Elsevier.
- Bird D, Gísladóttir G & Dominey-Howes D (2010), *Volcanic Risk & Tourism in Southern Iceland: Implications for Hazard, Risk & Emergency Response Education & Training*, Journal of Volcanology & Geothermal Research 189, 33-48, Elsevier.
- Brooks G & Friele P (1992), *Bracketing Ages for the Formation of the Ring Creek Lava Flow, Mt Garibaldi Volcanic Field, Southwestern British Columbia*, Canadian Journal of Earth Sciences 29, 2425-2428, Canadian Science Publishing.
- Chamberlin K (2016), *Megathrust: Surviving is Just the Beginning*, CreateSpace Independent Publishing Platform.
- Chester D (2005), *Volcanoes, Society & Culture*, Volcanoes & the Environment, 404-439, Cambridge University Press.
- Clague J, Munro A & Murty T (2003), *Tsunami Hazard & Risk in Canada*, Natural Hazards 28, 433-461, Kluwer.
- Doyle E, McClure J, Paton D & Johnston D (2014), *Uncertainty & Decision Making: Volcanic Crisis Scenarios*, International Journal of Disaster Risk Reduction 10, 75-101, Elsevier.
- Ferrier N & Haque C (2003), *Hazards Risk Assessment Methodology for Emergency Managers: A Standardised Framework for Application*, Natural Hazards 28, 271-290, Kluwer.
- Friele P & Clague J (2005), *Multifaceted Hazard Assessment of Cheekye Fan, A Large Debris Flow in Southwestern British Columbia*, Debris Flow Hazards & Related Phenomena, 659-683, Springer.
- Google Earth (2016), 49°49'05" N 123°06'50" W [Accessed: 12.05.2018].
- Green N (1990a), *Late Cenozoic Volcanism in the Mt Garibaldi & Garibaldi Lake Volcanic Fields, Garibaldi Volcanic Belt, SW British Columbia*, Geoscience Canada 17, 171-175.
- Green N (1990b), *Garibaldi Lake*, Volcanoes of North America, 143-144, Cambridge University Press.
- Jakob M & Friele P (2010), *Frequency & Magnitude of Debris Flows on Cheekye River, British Columbia*, Geomorphology 114, 382-395, Elsevier.
- Linde A & Sacks S (1998), *Triggering of Volcanic Eruptions*, Nature 395, 888-890, Macmillan Publishers Ltd.
- Mathews W (1990), *Garibaldi*, Volcanoes of North America, 144-145, Cambridge University Press.
- Moore D & Mathews W (1978), *The Rubble Creek Landslide, Southwestern British Columbia*, Canadian Journal of Earth Sciences 15, 1039-1052, Canadian Science Publishing.
- Pique News Magazine (2017), *Small Barrier Slide Prompts Provincial Assessment*, [Available online] <https://www.piquenewsmagazine.com/whistler/small-barrier-slide-prompts-provincial-assessment/Content?oid=4436529> [Accessed: 07.05.2018].
- Squamish Chief (2015), *Garibaldi Lake a Ticking Time Bomb?* [Available online] <http://www.squamishchief.com/news/garibaldi-lake-a-ticking-time-bomb-1.1753732> [Accessed 07.05.2018].
- Stasiuk M, Hickson C & Mulder T (2003), *The Vulnerability of Canada to Volcanic Hazards*, Natural Hazards 28, 563-589, Kluwer.
- Stefanovic I (2003), *The Contribution of Philosophy to Hazards Assessment & Decision Making*, Natural Hazards 28, 229-247, Kluwer.
- Susman P, O'Keefe P & Wisner B (1983), *Global Disasters: A Radical Interpretation*, Interpretations of Calamity from the Viewpoint of Human Ecology, 263-283, Allen & Unwin Inc.

# Breaking the Binary: Contesting Hegemonic Views of Sex and Gender Through a Focus on Intersex Bodies

Abbie Greig, Fourth Year Geography

*Abstract* – There is no place on earth more explicitly gendered than the body. This essay aims to illustrate this by discussing how, within the Western world, the space of the body is often physically and medically gendered due to the contention that sex and gender are both binary and mimetic. This is achieved through a focus on intersex bodies as spaces that contest this hegemonic notion by illustrating that sex is not binary, but rather exists on a scale of difference. I discuss how the conflation between sex and gender results in bodies always being something that have gender ascribed to them, thus meaning that bodies come into existence through the mark of their gender. As a result, I argue that intersex babies are dehumanised as an ‘it’ due to their lack of a clear, binary gender. In turn, they are often subjected to cosmetic ‘normalising’ surgery that constructs a binary gender by constructing the ‘corresponding’ binary sex. I conclude by arguing that all bodies are sites that are medically gendered, and advocate for a change in the essentialist views of sex and gender that still prevail throughout society.

Gender is one of the most important terms in Western language. It is a term we may not intentionally say on a day-to-day basis, but it is one we constantly use. As Cresswell (2013) notes: “[g]ender is everywhere” (154). This essay aims to discuss how, within the Western world, the space of the body is often physically and medically gendered due to the contention that sex and gender are mimetic. My focus on bodies is because there is no place on Earth more explicitly gendered than the body. I will highlight this through discussing the medical gendering of intersex bodies.

In order to understand how bodies are gendered, one must first understand what gender is and how it is distinguished from sex. Sex refers to “physical attributes and is anatomically and physiologically determined” (Fausto-Sterling, 2000, 3). Hence, sex is a biological term that is considered to be binary, producing male and female bodies. However, one does not see the genitals or chromosomes of an individual during everyday interactions. So how does one know if they are speaking to a man or a woman? This determination is the result of gender.

Gender is described by Fausto-Sterling (2000) as the “psychological transformation of the self – the internal

conviction that one is either male or female...and the behavioural expressions of that conviction” (3). In other words, gender refers to the socially constructed norms and attributes attached to bodies.

Whilst sex and gender may appear distinguishable, in reality this distinction is extremely muddled. Butler (1990) notes that considering both sex and gender to be binary “implicitly retains the belief in a mimetic relation of gender to sex whereby gender mirrors sex” (10). In this respect, the question could be posed as to whether there is any real difference between sex and gender. Have we reached a point where the two terms have become so conflated that they can no longer be distinguished?

By contrasting the ‘realness’ of sex with the socially constructed nature of gender, we create an idea whereby bodies are material bases that act as the foundation onto which gender is constructed. However, as Fausto-Sterling (2000) notes, “the idea of the material comes to us already tainted” (23). That is to say, material bodies are never simply sexed, neutral bodies: our pre-existing ideas on the mirroring of sex and gender force us to always see bodies in a gendered way. As such, McDowell (1999) writes that sex is “subsumable” within gender (15). In other words, gender and sex cannot be distinguished. So, if the term sex can only be accessed through the term gender, this implies that a body “cannot be said to have a signifiable existence prior to the mark of their gender” (Butler, 1990, 13). Thus, a body is something that has gender; it cannot be something that exists prior to gender. Let us consider this with a short anecdote.

A couple are travelling to the hospital for an ultrasound to find out the gender of their baby. They have the perfect shade of blue paint chosen, and the perfect shade of pink paint chosen for the nursery. They have a list of boy names, and a list of girl names. During the scan, the expectant parents are waiting to hear the phrase ‘congratulations, you’re having a girl/boy!’ I wish to draw attention to the word ‘a’ here. Whilst at first glance it may seem insignificant, upon deeper reflection it becomes something of the utmost importance. It suggests not that the baby *has* a gender, but that the baby *is* a gender. In

other words, a baby becomes human through its gender. The purpose of discovering a baby's gender during an ultrasound is not simply to enable parents to paint the nursery: it is to humanise their baby.

But what would happen if the midwife were unable to tell the expectant parents they are having a boy or a girl? What is *it* if neither male nor female? Without gender, a baby becomes an '*it*'. This dehumanisation is not caused by the baby lacking sex, but the baby lacking *gender*.

I previously said sex is biological, producing males and females. This is true. But sex does not exclusively produce males and females. Sex is a scale that results in "shades of difference" (Fausto-Sterling, 2000, 3). Sex cannot be categorised, especially in a binary manner. Our two 'true' sex categories of male and female simply represent polar ends of the scale, with the range of sexes existing in between being collectively known as intersex. In other words, a baby can be born both with body parts traditionally assumed to be male *and* body parts traditionally assumed to be female.

If one can be born with a sex that is neither male nor female, why is there an assumption, in the Western world at least, that sex is binary? Evidence shows that intersex births are relatively common. It is estimated that, worldwide, around 1.7 percent of births are intersex (Fausto-Sterling, 2000). This same figure represents the proportion of people who are born with naturally red hair (InterACT, n.d.). I am sure we have all seen someone with naturally red hair. Does it not follow, then, that we have all seen someone whose natural sex is intersex? Why is it that we did not recognise these individuals as intersex, but continued to classify them as male or female? To reiterate, one does not see sex: one sees gender. And whilst sex may be fluid and exist on a continuous scale, gender does not. Gender is binary. Hence, the existence of intersex bodies calls into question the traditional notion that sex, and gender are mimetic. If a baby does not have a completely male or female sex, that baby has no mirroring gender. And if a baby has no gender, that baby is an '*it*'.

Any suggestion that falsifies the hegemonic notion of sex and gender as mimetic must be suppressed. Sex and gender must be *made* to mirror one another. For intersex bodies, not only does this result in the construction of gender, but also the construction of sex through 'normalising' surgery. 'Normalising' surgery assumes that infants with the appearance of completely male or female genitals will grow up to embody the corresponding

binary gender. So whilst intersex bodies blur the boundaries between 'male' and 'female' sex, our rigid, binary notion of gender means these individuals are forced to conform to a 'male' or 'female' gender role, with surgery 'helping' them to do so. Hence, the site of the body is physically, medically *gendered* through 'normalising' surgery that alters one's *sex*.

But surely 'normalising' surgery is a thing of the past? Surely we can see that this purely cosmetic surgery creates a medical problem where there was no previous problem, given that the majority of intersex cases are medically harmless? One may agree with this, but that does not mean our current practices are different. Fausto-Sterling (2000) notes that "[n]o national or international standards govern the types of intervention that may be used" on intersex bodies (48). As a result, 'normalising' surgery is still common.

An American study published last year focused on intersex infants and the likelihood of them undergoing 'normalising' surgery (Nokoff *et al.*, 2017). Out of the thirty-seven infants in the study, thirty-five underwent surgery. Whilst it is important to acknowledge the limitations of such a small study, it does point to a much wider trend of intersex bodies being viewed as a 'problem'. This can also be seen within information available to parents of intersex children in the United Kingdom, which firmly implies that a baby cannot be brought up as intersex. For example, a document published by DSD (Disorders of Sexual Development) Families in 2014 gives suggestions to parents as to what they can call their baby before '*it*' is gendered. The document recalls that "[a] couple whose baby was born on Halloween called their baby 'pumpkin', until a few days later 'pumpkin' became Max" (4). A pumpkin is a *thing*, not a human. Only after 'pumpkin' was gendered did that baby deserve a human name: only then did that baby *become* human.

In summary, intersex bodies are often subjected to physical, invasive and medically unnecessary 'normalising' surgery. The purpose of this surgery is to give individuals a binary 'male' or 'female' sex, and hence allow them to obtain the 'corresponding' 'male' or 'female' gender. However, even if a baby is born with 'normal' genitalia, a medical practitioner will declare that baby's *gender* (boy/girl). Medical practitioners do not declare to parents: "the biological sex of your child is phenotypically male/female." Thus, bodies are *always* sites that are medically gendered. However, I hope that my essay has

done more than to simply illustrate this point. I hope it has highlighted what is arguably the most pressing human rights issue of our time: the intersex movement. Writing this essay made me angry. The treatment of intersex bodies is appalling. Change is vital. The question of how this change occurs, however, is one to which I have no answers. As McDowell (1999) notes: “rethinking gender divisions requires nothing less than the reconstruction of Western knowledge itself” (13). But just because something is difficult, it does not mean one should not try. After all, when has anything worthwhile in life ever been easy?

#### REFERENCES

Butler, J. (1990). *Gender Trouble: Feminism and the Subversion of Identity*. New York: Routledge.

Cresswell, T. (2013). *Geographic Thought: A Critical Introduction*. Chichester: Wiley-Blackwell.

DSDFamilies. (2014). *When your baby is born with genitals that look different...The first days*. DSDFamilies. Available at: <http://www.dsdfamilies.org/docs/brochures/DSD.pdf> [Accessed: 05.11.2017].

Fausto-Sterling, A. (2000). *Sexing the Body: Gender Politics and the Construction of Sexuality*. New York: Basic Books.

InterACT. (n.d.). *INTERSEX 101: Everything you want to know!* Available at: <https://interactadvocates.org/wp-content/uploads/2017/01/Intersex101-interACT.pdf> [Accessed: 09.11.2017].

McDowell, L. (1999). *Gender, Identity and Place: Understanding Feminist Geographies*. Cambridge: Polity Press.

Nokoff, N.J. et al. (2017). Prospective Assessment of Cosmesis Before and After Genital Surgery, *Journal of Paediatric Urology*, 13 (1), pp. 28.e1-28. e6.

# Mountain Hare Conservation in the Scottish Uplands

Ross S. Ewing, Fourth Year Geography

**Abstract** — Controversial research suggests that mountain hares (*Lepus timidus*) have a direct impact on the spread of louping-ill virus (LIV) in red grouse (*Lagopus lagopus scotica*). This poses a significant challenge for grouse moor managers, whose aim it is to maximise grouse densities for the provision of driven grouse shooting. Thus, hare populations are lethally controlled by grouse moor managers. Further contested research suggests that the national population of mountain hare is now at an all-time low, which the authors believe is, in part, due to the culling of hares by grouse moor managers. This paper reviews the credibility of both sets of research, before arguing that: i) the evidence base on which the culling of hares is based is unsubstantial; and ii) there is an urgent requirement for shooting estates to implement the methodologies recommended by Scottish Natural Heritage to clarify the conservation status of mountain hare in the Scottish Uplands.

## Introduction

The management of driven grouse moors has been, for many years, a contested and polarised issue in the Scottish uplands. There are many complex facets to this debate including the persecution of raptors, muirburn, the use of antihelminthic medicated grit to counter strongylosis from nematode worms (*Trichostrongylus tenuis*) and the culling of mountain hares (*Lepus timidus*) to combat louping ill virus (LIV) in red grouse (*Lagopus lagopus scotica*). The latter issue is the focal point of this short review.



Figure 1: Red grouse (left) and mountain hare (right).

## Mountain Hare and LIV

Mountain hare support non-viraemic transmission of LIV via the co-feeding of ticks (*Ixodes ricinus*) (Jones *et al.*, 1997) and are also an important tick reservoir (Laurenson *et al.*, 2003). Laurenson and others (2003) suggest that culling mountain hare can achieve reductions in LIV sero-prevalence and tick burdens on grouse chicks, and it was this study that has been utilised by grouse managers as the evidence base for culling hares (Gilbert, 2016).

The study by Laurenson and others (2003) is considered by many land managers to be a ‘breakthrough’ in the fight against LIV. However, it has since been subject to much criticism for three principal reasons. First, the study took place on a site where no red deer (*Cervus elaphus*) were present, which Gilbert (2016) points out as highly unusual in the context of the Scottish uplands. This is significant because red deer are prolific tick reservoirs. Second, the study lacked sufficient controls which is especially important where replication – due to logistics, financial costs and scale – is difficult (Cope *et al.*, 2004). Third, the study did not demonstrate a definitive link between facets of LIV (hare density, tick burdens and LIV sero-prevalence) and grouse density which is the distinguishing characteristic of grouse moor viability (Cope *et al.*, 2004; Harrison *et al.*, 2010).

The significant flaws highlighted above severely undermine the credibility of the study by Laurenson and others (2003), and by extension the entire practice of culling mountain hare in Scotland. Laurenson and others (2003) acknowledge in their recommendations that culling will only be effective in the absence of red deer, before saying that “a reduction in hare density may be the only method of improving red grouse harvests” in this deer-free scenario (Laurenson *et al.*, 2003, 183). The key issue with this recommendation is that the study failed to associate LIV sero-prevalence, tick burdens and hare density with grouse density (Cope *et al.*, 2004). Any recommendation with respect to “improving red grouse harvests” (Laurenson *et al.*, 2003, 183), therefore, is redundant.

Despite this, the recommendation to reduce hare densities has been keenly embraced by grouse moor managers. Although Laurenson and others (2003) do make some effort to explain that culling would only be effective in a deer-free environment, the broad-brush recommendation leaves little room for manoeuvre - especially for those few land managers who do work on deer-free moorland. It is also the case that those who manage land with active deer populations cull mountain hares (Gilbert, 2016). The likely motivations for this are four-fold: i) mountain hares are not a protected species; ii) Laurenson and others (2003) provided evidence showing that hares are important tick reservoirs; iii) in the same paper they suggested that culling could improve the annual grouse bag; and iv) some estates can yield commercial value from culling by offering hare hunting packages. Therefore, the incentive to cull is strong and it is unsurprising that many estates – deer or no deer – partake in this practice.

The ineffectiveness of culling mountain hare in a multi-host ecosystem is outlined in a study by Gilbert and others (2001) who show, using mathematical models, that culling mountain hare would be ineffective in controlling LIV even when the densities of alternate hosts are as low as 5 hosts km<sup>-2</sup>. In a subsequent paper, Harrison and others (2010) reviewed all of the evidence, including the paper by Laurenson and others (2003), and argued that there is insufficient evidence to show that the culling of hares could increase grouse densities in most areas. Despite this, hare culling remains a widespread management practice in the fight against LIV.

### The Implications of Culling Mountain Hare

Culling mammals to control the transmission of pathogens to a particular species - that the human race considers to be 'valuable' - is not an exact science and is fraught with unpredictability (Harrison *et al.*, 2010). The already complex situation is compounded by the inherent difficulties in counting mountain hare populations, meaning it is very challenging to accurately determine the implications of culling on hare conservation. Nevertheless, a number of studies have set out to determine said implications. This section will focus on the findings of the most comprehensive - and most recent - study, undertaken by Watson and Wilson (2018).

The study is impressively far-reaching both spatially and temporally, with data from 113 sites across the north-east Highlands spanning seven decades between 1943 and 2017 (Watson and Wilson, 2018). The study's methodologies are similar to the techniques utilised by

Brown and Shepherd (1993) to count ground nesting birds, where an observer walks along transects at 90° to the wind and records each flushed hare (Watson and Wilson, 2018). Watson and Wilson (2018) acknowledge that their counts do not provide approximations of absolute density or population sizes, as these vary by terrain and habitat (Newey *et al.*, 2018; Newey *et al.*, 2008). Instead, they argue that their methodology "provides an index of density as the basis for trend estimation" (Watson and Wilson, 2018, 4).

The study suggests that hare densities are facing a long-term decline on heather moorland sites, but not on alpine sites (Watson and Wilson, 2018). Watson and Wilson (2018) claim that the rate of population decline has been most rapid since culling was employed as a management practice to control LIV (Figure 2). The long-term decline, between 1954 and 1999, is representative of an 80% reduction in mountain hare density (Watson and Wilson, 2018). Iason and others (2008) suggest that long term declines could be a direct consequence of habitat loss, predominantly from woodland regeneration and the abandonment of grouse moor management.

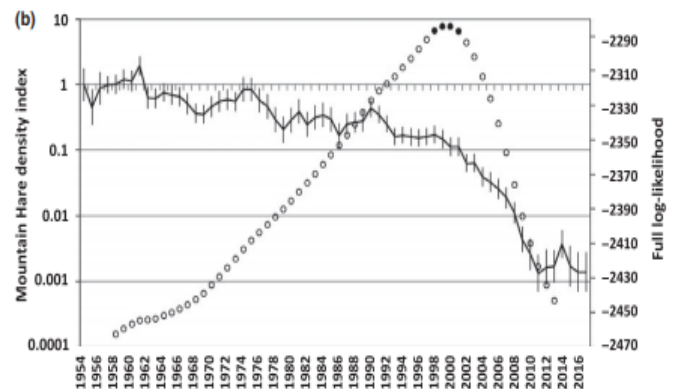


Figure 2: Density index of mountain hare on heather moorland sites, represented by the solid black line. Note the steeper gradient from 2003. Source: (Watson and Wilson, 2018, 2668).

The rapid decline in mountain hare density observed by Watson and Wilson (2018) cannot, by their own admission, be attributed for certain to the practice of culling. However, Watson and Wilson (2018) point to other studies, which show that culling can decimate hare densities, as possible causes for explanation (Newey *et al.*, 2008; Knipe *et al.*, 2013). Watson and Wilson (2018) dismiss cyclicity in mountain hare populations as a likely explanation by arguing that the declines recorded exceed the troughs associated with cycling populations. Therefore, they argue that a change in grouse moor



management is the probable cause (Watson and Wilson, 2018).

### Debates and Controversies

Many groups which advocate shooting and some academics dispute the findings of the Watson and Wilson (2018) study. There are a number of reasons for this which primarily concern the counting methodology used. Methodologies used to count mountain hare were rigorously reviewed by Newey and others (2018) on behalf of Scottish Natural Heritage just before the Watson and Wilson (2018) study was published.

Newey and others (2018) conclude that walked transect surveys during daylight hours – the exact methodology employed by Watson and Wilson (2018) – only sample a small proportion of the hares present and is therefore unlikely to provide a reliable index of population or density. This assessment alone, in conjunction with the evidence supplemented in the study, is enough to justifiably cast significant doubt on the findings of the Watson and Wilson (2018) paper.

Newey and others (2018) arrive at this conclusion by comparing a variety of counting methodologies to the highly intensive and accurate practice of spatial capture-recapture (SCR). SCR is impractical, expensive and time consuming, and therefore is not suitable to be employed on a large scale. The study compares less-invasive counting practices to the SCR results to gauge which methodologies could generate the most accurate findings (Newey *et al.*, 2018). The study suggests that night time transect surveys, using either high powered lamps or thermal imaging equipment, can generate results which closely correlate with SCR results, while dung accumulation rates can also help inform the index of hare abundance (Newey *et al.*, 2018).

### Conclusion

This review has referenced a number of contentious issues and debates which, in many ways, are not surprising. Mountain hare research in the uplands is inherently challenging, not easily replicable and compounded by a varying, multi-host ecosystem. Despite this, one clear conclusion can be drawn: the evidence on which the culling of mountain hares is justified is unsubstantial. Further research into the implications of culling mountain hare on densities of grouse is required.

Without demographic data, it is inherently difficult to

recommend meaningful management practices which are beneficial to: i) the grouse shooting industry; and ii) the conservation status of mountain hare in Scotland. Therefore, this review advocates for the new counting methodologies recommended by Newey and others (2018) to be implemented as a matter of urgency in a bid to determine the current state of mountain hare conservation in Scotland.

### REFERENCES

- Brown, A. F., and Shepherd, K. B. (1993). A method for censusing upland breeding waders. *Bird Study*, 40, pp. 189-195.
- Cope, D. R., Iason, G. R., and Gordon, I. J. (2004). Disease reservoirs in complex systems: a comment on recent work by Laurenson *et al.* *Journal of Animal Ecology*, 73, pp. 807-810.
- Gilbert, L. (2016). *Louping ill virus in the UK: a review of the hosts, transmission and ecological consequences of control.* *Experimental and Applied Acarology*, 68, pp. 363-374.
- Gilbert, L., Norman, R., Laurenson, K. M., Reid, H. W., and Hudson, P. J. (2001). Disease persistence and apparent competition in a three-host community: an empirical and analytical study of large-scale wild populations. *Journal of Animal Ecology*, 70, pp. 1053-1061.
- Harrison, A., Newey, S., Gilbert, L., Haydon, D. T., and Thirgood, S. (2010). *Culling wildlife hosts to control disease: mountain hares, red grouse and louping ill virus.* *Journal of Applied Ecology*, 47, pp. 926-930.
- Iason, G. R., Hilbert, I. A. R., Hewson, R., and Dingerkus, K. (2008). *Mountain Hare / Irish Hare Lepus timidus in Harris, S., and Yalden, D. W. (Eds.) Mammals of the British Isles: Handbook.* Fourth Edition, pp. 220-228, London, UK.
- Jones, L., Gaunt, M., Hails, R., Laurenson, K., Hudson, P. J., Reid, H. W., and Gould, E. (1997). *Amplification of louping-ill virus infection during co-feeding of ticks by mountain hares (Lepus timidus).* *Medical and Veterinary Entomology*, 11, pp. 172-179.
- Knipe, A., Fowler, P. A., Ramsay, S., Haydon, D. T., McNeilly, A. S., Thirgood, S., and Newey, S. (2013). The effects of population density on the breeding performance of mountain hare *Lepus timidus*. *Wildlife Biology*, 19, pp. 473-482.
- Laurenson, M. K., Norman, R. A., Gilbert, L., Reid, H. W., and Hudson, P. J. (2003). Identifying disease reservoirs in complex systems: mountain hares as reservoirs of ticks and louping ill virus, pathogens of red grouse. *Journal of Animal Ecology*, 72, pp. 177-185.
- Newey, S., Fletcher, K., Potts, J., and Iason, G. (2018). Developing a counting methodology for mountain hares (*Lepus timidus*) in Scotland. *Scottish Natural Heritage Research Report 1022*.
- Newey, S., Iason, G., and Reynor, R. (2008). *The conservation status and management of mountain hares.* *Scottish Natural Heritage Commissioned Report No. 287*, Battleby.
- Watson, A., and Wilson, J. D. (2018). Seven decades of mountain hare counts show severe declines where high-yield recreational game bird hunting is practised. *Journal of Applied Ecology* 2018, pp. 2663-2672.

# Positionality Issues as a Feminist Female Geographer: Lessons from Galway

Carys Stirling, Fourth Year Geography

**Abstract** – By embedding oneself in the research process, much can be revealed about the power dynamics within organisations and the ways in which certain people and views are privileged. This account reflects on my experience as both a novice researcher and a woman. Following reflections on two semi-structured interviews conducted on an undergraduate fieldtrip in Galway, I argue that a post-structural feminist epistemology and methodology can transform the apparent disadvantage I experienced as a female researcher on account of my gender into a meaningful way of exploring important geographical themes. With this approach, the differences in how I was treated during interviews compared to my male colleagues and our different perceptions of interview dynamics can be understood as constituting findings in and of themselves, rather than being detrimental to the research process. Therefore, I reflect that simply analysing the words of our participants failed to capture the real power dynamics at play. Examining the non-verbal dynamics between interviewer(s) and interviewee(s), as well as differences in researchers' observations, emotions and interpretations can allow this theme to be explored in greater depth.

## Geographical Context

In 2015, Galway, originally a small fishing village on the west-coast of Ireland which evolved into a contemporary cultural hub and tourist hotspot, was awarded European Capital of Culture for the year 2020. The objective of this project is to 'unlock the vast cultural capacity of Galway City and County' and strengthen values of 'inclusivity, participation and cultural sustainability', now and into the future (Galway 2020, 3-4). However, some Galwegian cultural players are critical of this optimism, implying that the project is painting a rose-tinted view of what is really a 'pity city, [a] shitty city' (Higgins in Reilly, 2016). Thus, our research emerged from an awareness of these conflicting views and subsequent interest in querying the extent to which Galway 2020 is an inclusive project. This research was carried out in a group of four on an undergraduate field trip to Galway in April 2018.

Culture, 'the spectacle', and inclusivity were three themes that arose during our exploration of the literature. Our post-structural feminist stance led us to understand culture, one of the 'two or three most complicated words

in the English language' (Williams, 1976, 76), as something which is determined, constructed and produced via ideology and discourse (Rosati, 2017). Jackson (1989) urges us to question the hegemonic interests at play in its popular construction. Both Galway 2020 and the events it is to comprise can be understood as a 'spectacle': a 'large-scale cultural event, festival or celebration, or to an urban scene or stage set presented for visual consumption' (Pinder, 2009, 717). Geographical analyses of the spectacle have explored the ways in which image production, tourism and capital investment combine to produce a packaged and profitable 'culture' which stakeholders can harness to promote urban development (Pinder, 2009). If culture is multifaceted and ambiguous, yet it is being packaged and commercialised in this fashion, we must ask: whose particular definition of 'culture' is being privileged? Thus, our research aim emerged:

*To document and understand the opinions of various local stakeholders regarding the 'inclusivity' of the 2020 Capital of Culture.*

Inclusivity was understood in terms of the ability of different people from different cultural spheres to access powerful, creative spaces that will be generated by Galway 2020, informed by our post-structural feminist epistemology, in which privileging partial perspective is a principal focus (Haraway, 1988).

## Methodology

*"The questions we ask and the ways in which we frame and attempt to answer them are intimately bound up with our view of the world"* (McDowell, 1997, 382).

Given our epistemological stance, we chose to conduct semi-structured interviews to unearth, probe and privilege the opinions of fourteen stakeholders, including buskers, members of the 2020 committee, theatre staff and a local painter. Reflective diaries (recommended by Hay, 2010) were completed in Galway and our group met daily to discuss our thinking. Herod (1993) argues that the 'open-ended interview...can provide a rich source of

what, after Geertez (1973), we might call “thick evidence”, capturing ‘subtle complexities underlying particular decision making processes which are frequently missed by large scale, standardised statistical analyses’ (305-306). Until reviewing my reflections for the following account, it was not clear to me quite *how* ‘thick’ and subtly complex this evidence can be.

### Reflections

I was incredibly fortunate to end up in a wonderful group who I am now close with as geographers and as friends. However, in the early stages, I lacked confidence and was cautious when voicing my opinions due to the ‘superior’ abilities I perceived my fellow group members (both male and female) to possess. Katila and Meriläinen found in their study of gender in academia, that women have a tendency to describe themselves modestly, attributing academic success to ‘fate or luck’ (1999, 163). However, they also note the following: “We should be careful not to see ourselves merely as victims of gendered organizational cultures but as co-producers of it.” (1999, 164). Indeed, part of my caution can, I believe, be

attributed to ‘imposter syndrome’, or ‘feelings of not being as capable or adequate as others perceive [one] to be’ (Brems, 1994, 183-184). This is largely self-inflicted, and from a post-structural perspective probably linked to efforts of self-surveillance and self-subjugation as Foucault describes in his theory of biopower (in Pylypa, 1998). Yet it is also likely a symptom of the fact that I am a woman. As we worked more closely, our group dynamic and communication strengthened, and my awareness of gender and its influence faded into the background a little. However, our final interview brought it back into sharp focus.

On our final day, my male colleague and I went to a local theatre to interview Sean\*, CEO of a major annual event and Galway 2020 board member. Figures 1-3 are excerpts from my reflective diary on that day.

#### *Diary Entry, Thursday 26<sup>th</sup> April 2018*

*Useful – most difficult interview so far. He was a bit intimidating. Good that it was our final interview because we had experience and were able to handle it better than if it was our first. We had not realised the status of our interviewee prior to meeting him, and it quickly became apparent that it was going to be more challenging than previous interviews. Instead of transcribing, E quickly joined me in asking questions which was extremely helpful because our interviewee had a dominant/almost overpowering presence (but also wasn’t particularly forthcoming with answers). So I think it was necessary for two of us to speak to him to create some balance. However, as soon as E chipped in, Sean stopped looking at me and focussed his attention almost entirely on E, despite the fact that I was the original interviewer and E the transcriber.*

*Showed us:*

- *Not all interviewees can be receptive to our questions and may not go out of their way to make us feel comfortable (unlike those in e.g. the Galway 2020 HQ, House Hotel, An Taibhdhearc)*
- *Common ground between interviewer and interviewee (in this case, it might have been simply the fact that E and Sean are both male) can make the interviewee more receptive to our questioning*
- *Possible observation: when Sean began to focus his attention a lot more on E, he became a lot more business focussed, discussing ‘target market’, contacting travel journalists, papers with ‘big culture sections’, admin side of his job, ‘if you want to be famous’...might be relevant, might not... ‘if that makes sense’*
- *Also, there was quite a barrier between us (due to the table and seating arrangement) – interesting power dynamic?*

Figure 1: Excerpt from reflective diary, Thursday 26<sup>th</sup> April 2018.

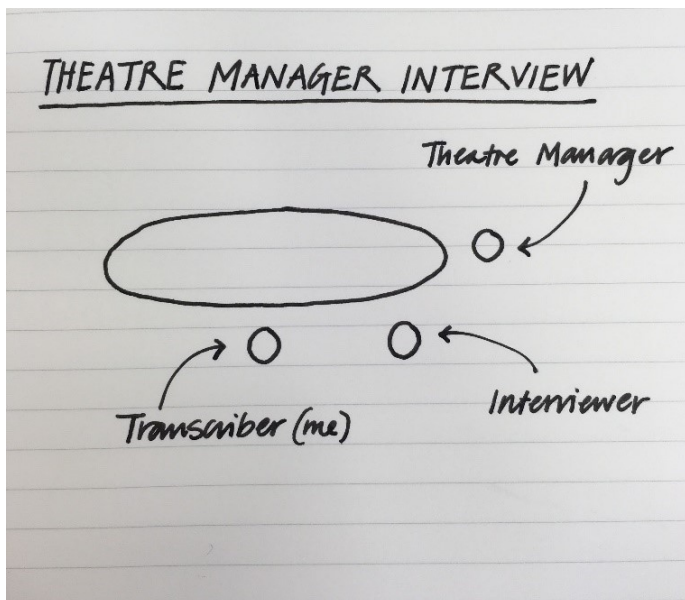


Figure 2: Drawing from diary showing relaxed seating arrangement during an earlier interview with theatre manager. Source: (Stirling, 2018).

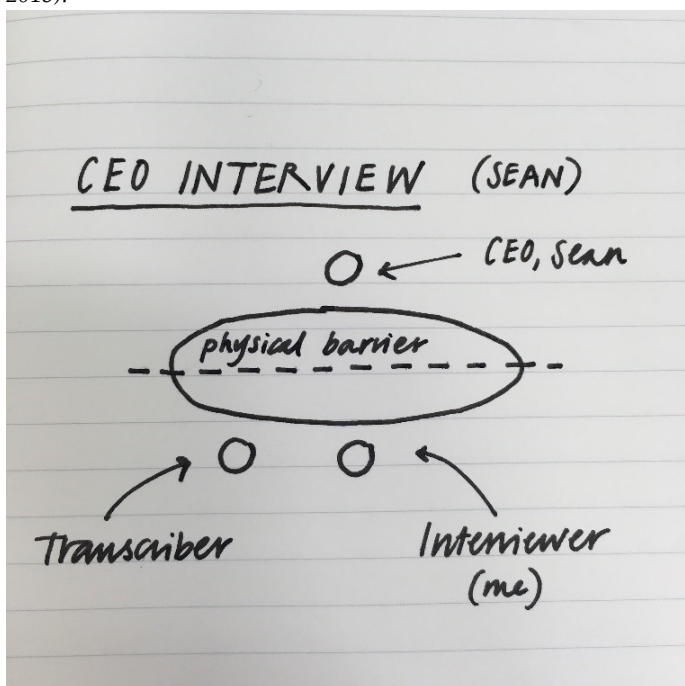


Figure 3: Drawing from diary showing seating arrangement during interview with CEO, Sean. Source: (Stirling, 2018).

There was a clear imbalance of power in this interview: Sean is a CEO, we are undergraduates. As Fine highlights, 'power asymmetries structure gender relations' (1992 in Deutsch, 2004, 893). This palpable difference may have prompted our interviewee to feel allied with my colleague over me, given their shared gender. Indeed, it has been established that interviewees do indeed respond differently to female and male interviewers (Hyman *et al.*, 1954 in Herod, 1993). Furthermore, Sean was one of the few participants who alluded to how 'the spectacle' of

Galway 2020 can be turned into a commercial success (when he referred to 'target markets', gaining press coverage and achieving fame). It was interesting that these more business-focused themes emerged when his focus switched to my male colleague. If Sean, a powerful player in Galway 2020, has subtly gendered biases like those he exhibited in our interview, what does this mean for the inclusivity of the Capital of Culture event? Whose voices are privileged and whose definitions of 'Galway culture' are showcased?

The contrast between this and our previous, far more comfortable interviews was pivotal in deepening my understanding of the term 'positionality'. Cresswell defines the term as the 'recognition that the way in which we know things is based on who we are, our particular biography, and our locatedness within social structures of class, gender, race, etc.' (2013, 280). It 'should not be treated unproblematically', but 'as dynamic and relational depending on the research context' (Bennett, 2002, 142). Until this point, I had simply understood my positionality to be something which could affect both how I am perceived by my interviewee and the responses they provide.

However, positionality must not be understood in isolation from the research findings, and should not merely be viewed as a (potentially disadvantageous) influence on the quality and quantity of information gained. As Herod asserts 'there is more to evaluating the meaning of an interview than simply analysing the words spoken' (1993, 311). Sean's body language, shifting his gaze to focus almost entirely on my male colleague, made me question whether our approach (analysing what each stakeholder *said*) was in fact appropriate, given our epistemological stance. Unlike in quantitative research, the semi-structured interview treats variation between interviews (with different interviewers as well as interviewees) as meaningful 'data', rather than as 'errors'. This 'data' can illuminate perceptions on the meaning of questions, answers, the researcher-interviewee dynamic, and how different research subjects comprehend and decipher particular situations (Mishler, 1986 in Herod, 1993). Thus, the different nonverbal dynamics between the interviews illustrated above is meaningful. With this in mind, exploring interviewer-interviewee power dynamics in greater depth may have been a fruitful avenue to explore in relation to our 'inclusivity' focus, had we more time in the field.

The significant impact of gender on our research led me to

reflect upon another interview. It is relatively well established that men are typically more vocal and forthcoming with their opinions than women in mixed group interviews (Strodbeck and Mann, 1956; Aires, 1976 in Herod, 1993). Interestingly, this was not the case in the one group interview with two members of the Galway 2020 committee, in which our female interviewee was slightly more talkative than her male counterpart. Afterwards, my male colleague mentioned that he found her 'domineering', not something which I had picked up on. It is likely that I did not draw this conclusion because (as a woman [and feminist] who is sometimes quiet in group discussion) I had anticipated she would be less vocal, but was pleasantly surprised to be proven wrong. It could be that she wasn't 'domineering' at all, but instead revealed how my partner's own positionality affected his opinion. This could be because our interviewee stood out as unusual, as it is more typical for men to be more 'domineering' in group interview scenarios (Strodbeck and Mann, 1956, in Herod, 1993). Equally, given my aforementioned personal stance, if the male interviewee had been more vocal, I might have made the same observation, but instead about him. This illustrates Dubois' argument that positionality and personal stance influence both our questions and our interpretations (2004).

### Conclusion

Fieldwork has received criticism from some feminist geographers for being overly masculinist (e.g. Rose, 1993 in Deutsch, 2004). Yet I would argue that, much like debates around queering GIS (e.g. Brown & Knopp, 2008), it would be foolish for feminists to ignore its utility. The above reflections have demonstrated the invaluable lessons which emerge from *learning by doing*. Not only am I now familiar with the practicalities of research, but I have had academically informed experience of some of the empirical issues upon which my epistemological stance is based. The above account is primarily based on diary entries, and I believe these reflections demonstrate how reflexive diaries are a real asset to the research process. The different emphases perceived by different group members reflects the 'messy' (McDowell, 2001 in Sharp, 2005) and complex nature of the research process, and as feminist researchers we must understand that differing observations, interpretations and emotions of researchers, produced by their unique positionality, constitute findings in and of themselves, which should be valued

and explored.

\* name has been changed for the purpose of anonymity.

### REFERENCES

- Bennett, K. ed., (2002) 'Participant Observation', in P. Shurmer-Smith, *Doing Cultural Geography*. London: Sage, pp. 139-149.
- Brems, C., Baldwin, M. R., Davis, L. & Namyniuk, L. (1994). The Imposter Syndrome as Related to Teaching Evaluations and Advising Relationships, *The Journal of Higher Education*, 65(2), pp. 183-193.
- Cresswell, T. (2013). *Geographic Thought: A Critical Introduction*. Oxford: Wiley-Blackwell.
- Brown, M. and Knopp, L. (2008). Queering the Map: The Productive Tensions of Colliding Epistemologies. *Annals of the Association of American Geographers*, 98(1), pp.40-58.
- Debord, G. (1967). *Society of the Spectacle*. Black and Red.
- Deutsch, N. L. (2004). Positionality and the Pen: Reflections on the Process of Becoming a Feminist Researcher and Writer, *Qualitative Inquiry*, 10 (6) pp. 885-902.
- Galway 2020. (2016). *Galway Bid Book 2*. Galway Bid Book 2, Galway 2020 Committee.
- Haraway, D. (1988). Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective, *Feminist Studies*, 14(3), pp. 575-599.
- Herod, A. (1993). Gender Issues in the Use of Interviewing as a Research Method, *Professional Geographer*, 45(3), pp.305-317.
- Jackson, P. (1989). *Maps of Meaning*. Routledge.
- Katila, S. & Meriläinen, S. (1999). A Serious Researcher or Just Another Nice Girl?: Doing Gender in a Male-Dominated Scientific Community, *Gender, Work and Organisation*, 6(3), pp.163-173.
- Reilly, J. (2016). 'This is pity city, sh\*\*ty city' - Galway poet skewers City of Culture in a savage ode - *Independent.ie*. [online] Independent.ie. Available at: <https://www.independent.ie/entertainment/festivals/this-is-pity-city-shty-city-galway-poet-skewers-city-of-culture-in-a-savage-ode-34889775.html> [Accessed: 17.05.2018].
- McDowell, L. (1997). Women/gender/feminisms: Doing feminist geography, *Journal of Geography in Higher Education*, 21(3), pp.381-400.
- Pinder, D. (2009). 'Spectacle'. In: Gregory, D., Seanston, R., Pratt, G. & Watts, G. (eds) *The dictionary of human geography (5th edition)*. Oxford: Wiley-Blackwell.
- Rosati, C. (2017). 'Cultural Turn', in *The International Encyclopaedia of Geography*.
- Sharp, J. (2005). Geography and gender: feminist methodologies in collaboration and in the field, *Progress in Human Geography*, 29(3), pp. 304-309.
- Williams, R. (1967). *KEYWORDS A Vocabulary of Culture and Society*. New York: Oxford University Press.

# Analysis of Sea Turtle Nesting Patterns on a South Florida Beach

Connor Milton, Fourth Year Geography

**Abstract** — The beaches of South Florida are an important nesting site for several species of threatened sea turtle, principally the loggerhead sea turtle (*Caretta caretta*) and the green sea turtle (*Chelonia mydas*). Unfortunately, these nesting grounds are threatened by climate change, human activities, and predation which can alter the beach into less suitable nesting habitat and reduce egg survival rates. This study will look for hotspots in nesting over two years to see if nesting exhibits a clustering pattern, and to determine if any such hotspot remain in the same location between years or vary from year to year. It will also look for similar patterns in nest predation, to see if predators follow nesting density or remain in a certain part of beach. These analyses will allow conservationists to note any part of the beach that requires extra protection to preserve nesting potential, helping these species recover to more stable levels.

## Introduction

South Florida's beaches are an important nesting site for the endangered loggerhead (*Caretta caretta*) and green (*Chelonia mydas*) sea turtle species, whose nests are monitored for protective and research purposes. Analysing patterns in nesting and predation, and their changes over time, is useful for conservation because sea turtles return to nest on the same beach where they hatched, making an understanding of these sites critical to the survival of the species. This analysis will examine the distribution of both nests and predation from the summers of 2017 and 2018, determine if there are any notable shifts in the patterns from year to year, and try to provide an explanation for any patterns or changes.



Figure 1: Map of Florida showing location of Boca Raton. Source: (Milton, 2018).

## Site Description and Context

The beach being examined here is in the City of Boca Raton, on Florida's Atlantic coast. It runs north-south for approximately 5 miles and is cut by an inlet approximately three-quarters of the way down. The land behind the beach is a mixture of condominiums and parkland. The beach is sandy and has a gentle gradient - ideal for nesting - but its exposed position makes it vulnerable to large erosion events from storms and hurricanes; important given the overlap between hurricane season (June-November) and sea turtle nesting season (March-November) (Milton *et al.*, 1994). Erosion events can form steep-but-temporary sand slopes known as scarps; some of which have reached over 6ft in height on this beach. Scarps can prevent turtles from accessing parts of the beach for weeks at a time, affecting nesting patterns. Further complicating the picture are human impacts on the beach. Tractors used for beach maintenance compact subsurface sand, which reduces the nesting viability of spots, as turtles cannot dig through it to lay eggs. Additionally, due to the erosive processes mentioned above, the city has occasionally implemented beach nourishment projects, often using a different kind of sand from that native to the beach; one such project took place from 2017-2018.

As grain size affects nesting viability, nourishment projects can serve to reduce the nesting viability of portions of the beach (Rumbold *et al.*, 2001; Milton *et al.*, 1997). Furthermore, the condominiums and parks serve to create a mixture of light levels on the horizon behind the beach. Large, dark (due to lighting restrictions) condominiums could help block light from the city behind them. Additionally, parkland could provide a dark backdrop to the beach, but might not block high levels of light pollution from the city as effectively as condos. Sea turtles prefer to nest in darker sections of beach, so this mixture of backgrounds to the beach could affect the distribution of nesting on the beach (Witherington, 1992). This mixture of parkland and condominiums might also affect the predation of nests; while all of the beach has vegetation at its rear, the large stretches of park should house a larger number of predators; and thus see higher predation rates than areas with condominiums and limited vegetation. The principal predators on this beach are raccoons and foxes, both of which attack nests

nocturnally, so patterns of human beach use have negligible effect, as the beach is essentially empty at night.

influence future beach management policies regarding beach ploughing and nourishment projects.

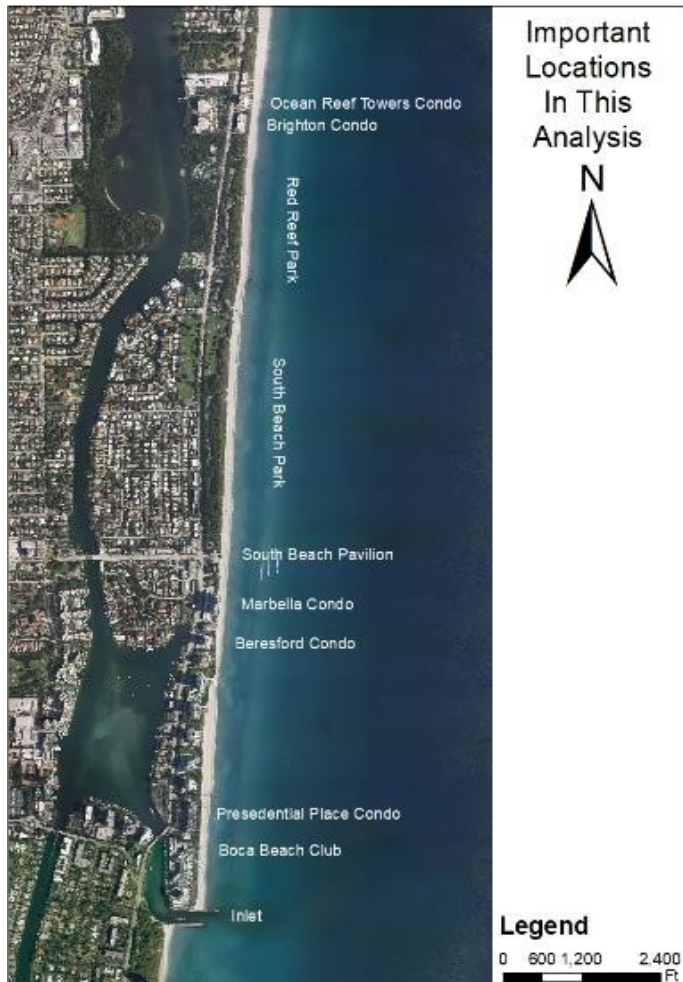


Figure 2: Map showing names of key parks and condominiums referenced throughout this analysis. Source: (Milton, 2018).

Table 1: Abbreviations for the locations shown in Figure 2.

Key Abbreviations	
Ocean Reef Towers	ORT
Reed Reef Park	RRP
South Beach Park	SBP
South Beach Pavillion	The Pavillion
Presidencial Place	PP
Boca Beach Club	BBC

The complex nature of this beach, with changing beach size, profile, accessibility, and sand type, means that turtle nesting patterns could vary greatly from year to year. Alternatively, some parts of the beach might remain nesting hotspots, showing little change between nesting seasons. Knowing the location of any hotspots could

### Data

The data used in this project was collected and supplied by the Gumbo Limbo Environmental Complex, a nature centre and sea turtle rehabilitation facility that monitors this stretch of beach. The basemap is made from publicly available aerial imagery taken by the Florida Department of Transportation. All easting and northing values are in the State Plane Florida East, NAD\_1983\_HARN, and values are in feet, as this is the unit used in the aerial photography of the basemap.

### Methods

Shapefiles were created of all the nests each year, as well as all predated in each year. Kernel density analyses were then run for each shapefile, using a cell size of 25ft and a search radius of 250ft. These were chosen because 250ft is the estimated average width of the beach; and 25ft for cell size because it is small enough to show patterns across the width of the beach but large enough to be appropriate for observed turtle nesting densities. These kernel density analyses created estimated density rasters for yearly distributions of nests and predation events, which were then normalised using the raster calculator. The probability of a nest being predated for each cell was calculated using the following equation:

$$\left( \frac{\text{Normalized Predation Density Raster}}{\text{Normalized Nest Density Raster}} \right) \times 100$$

This gave a density-independent predation map, which would determine if some areas are heavily predated irrespective of nest density.

The probability of predation raster from 2017 was subtracted from the 2018 raster to show changes in density-independent predation between the two years. These were given a stretched blue-red colour scale; with blue shades indicating negative values (i.e. higher values in 2017) and reds indicating positive values (i.e. higher values in 2018). To centre the scale on zero, the minimum and maximum values were both set to be the more extreme of the original minimum or maximum values.

For comparing nesting densities, the changes between years was compared visually rather than by subtracting the rasters, as simply subtracting the rasters shows large decreases in density, which are the result of changed nest count between the years, rather than changes in pattern.

Comparing clusters by eye shows changes in the locations of hotspots regardless of nest count; and it is the change in the locations of hotspots that this analysis seeks.

## Results

### Nest Density



Figure 3: 2017 nest density. Hotspots of nesting are present at Brighton/Ocean Reef Towers, throughout Red Reef Park, south of the pavilion in a cluster focused on the Beresford Condominium and just north of the inlet between Presidential Place and Boca Beach Club. Source: (Milton, 2018).



Figure 4: 2018 nest density. Hotspots of nesting are present at Brighton/Ocean Reef Towers and throughout Red Reef Park. There is a cluster south of the pavilion near the Beresford Condominium, but it appears to have expanded north and south along the beach from its 2017 boundaries. The Presidential Place/Boca Beach Club cluster has remained in place between years, but the centre of the cluster has substantially decreased in nest density. Source: (Milton, 2018).





Figure 5: Density-independent predation in 2017. There is a cluster at Brighton/Ocean Reef-Towers, several clusters of varying intensity through Red Reef Park, and some weak hotspots south of the pavilion, around the Beresford nesting cluster and Presidential Place/Boca Beach Club. Source: (Milton, 2018).



Figure 6: Density-independent predation in 2018. There is a cluster at Brighton/Ocean Reef Towers, but it has decreased in intensity and increased in size since 2017. Predation in Red Reef Park has largely decreased in intensity, but one central cluster in the park has dramatically increased in intensity of predation. South of the pavilion, predation hotspots remain in largely the same locations as in 2017, but with moderate increases in predation intensity. Source: (Milton, 2018).

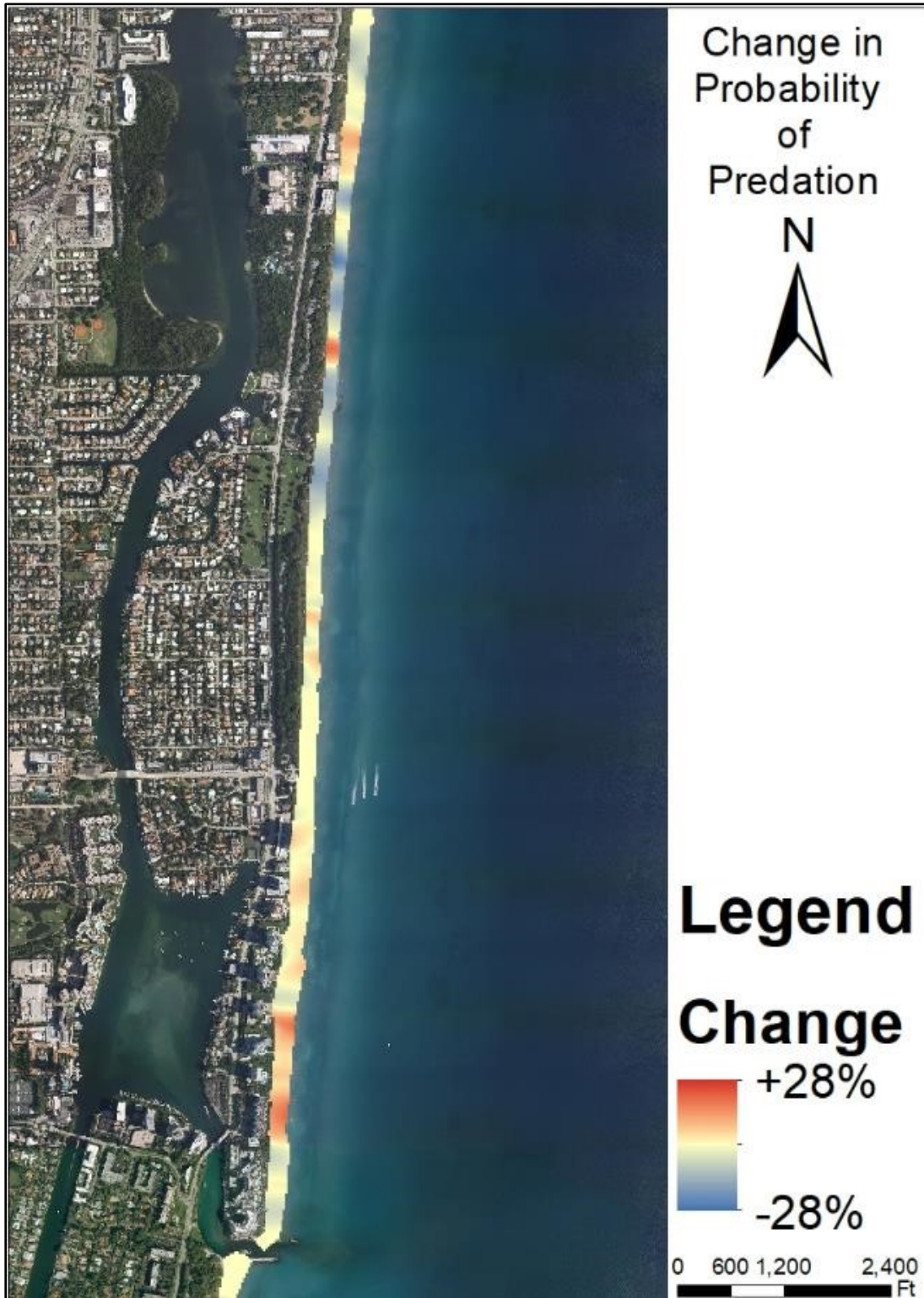


Figure 7: Change in density-independent predation between 2017 and 2018. The Brighton/Ocean Reef Towers cluster lost predation intensity in the southern part of the cluster but increased in the northern part, due to the change in nest density patterns in this cluster. The central Red Reef Cluster shows a large increase in predation as well, with decreases throughout the rest of Red Reef Park. South of the pavilion, predation decreased in front of Boca Beach Club but increased to the north, from Presidential Place to Sabal Shores Apartments. Source: (Milton, 2018).

## Discussion

The above analyses show that there is little change between turtle nesting patterns between 2017 and 2018. There are consistently clusters at Brighton/ORT, throughout RRP, and south of the pavilion at Beresford and PP/BBC; while South Beach Park remained low in nesting compared to other parts of the beach. Variations in nesting pattern are minor, so are most likely explained by shorter-term factors such as scarps and/or tractor action, rather than more permanent changes caused by nourishment projects. Unfortunately, there is no data showing the location and duration of scarps or nourishment projects at this time, so I could not investigate further, although such data is expected to become available in the near future.

With regards to the condo/park affecting nesting site preference, park backed by another park (e.g. RRP) showed consistently high concentrations of nesting, while park backed by city (e.g. SBP) showed consistently low levels of nesting; condos in front of city (blocking out light) showed higher concentrations than condos in front of water (less light to block). Given the intense light pollution produced by Florida's east coast and the variation in condo nesting sites, testing light intensity along the beach to determine actual night-time light levels would be necessary to determine whether there are any variations in light levels along the beach that might impact nesting. Additionally, further research mapping tractor action, nourishment projects and false crawls (turtles crawling up the beach and back without nesting) could reveal parts of the beach where the sand makes nesting unsuitable for nesting. This could help further explain nesting patterns and the potential impacts of these activities (Rumbold *et al.*, 2001).

For predation, it seems that intensity is strongly linked to yearly nesting density in the Brighton/ORT cluster, with predation patterns mirroring changes in nest distribution. However, the area is also a major density-independent predation hotspot. RRP is similar, with its stretch of beach being a moderate density-independent hotspot, although specific areas within it are density-dependent yearly. This would indicate that the predators living in the park search for nests over a reasonable area, rather than staying on a single section of beach. This seems to exclude the central cluster in RRP, where a large decrease in nest count saw a

large increase in predation probability, indicating that predation here is not density-dependent. South of the pavilion, the PP/BBC cluster showed a moderate decrease in nest intensity but no increase in predation, which instead increased massively just to the north of the cluster despite the PP/BBC cluster having equally intense nesting as the spot that predation moved to. This could be due to construction at the condo just to the south of the BBC, which might have disturbed the predators and caused them to move slightly to the north. However, the dates of construction and predation would be needed for further investigation.

## Conclusion

While there are small yearly variations in the nesting patterns of sea turtles on this beach, there seems to be little change in the overall pattern suggesting temporary factors predominantly influence variations in nesting patterns. Both years show major clusters at Brighton/Ocean Reef Towers and Presidential Place/Boca Beach Club, as well as several clusters in Red Reef Park that changed in individual importance, but whose locations remain unchanged. South Beach Park generally maintains a low intensity of nesting, while the Beresford cluster generally show a high nest density. Predation is largely density dependent, but the Brighton/Ocean Reef Towers cluster and central Red Reef Park cluster seem to be predation hotspots regardless of nest density. However, the two years of data used in this analysis are really not enough for substantial results. Ideally, data from previous years and/or future years could be obtained to properly search for long term patterns in nesting or predation location.

## REFERENCES

- Milton, S.L., Lutz, P.L., Schulman, A., Leone-Kabler, S. (1994). Effects of Hurricane Andrew on the Sea Turtle Nesting Beaches of South Florida. *Bulletin of Marine Science*, 54, pp.974–981.
- Milton, S.L., Schulman, A.A. & Lutz, P.L. (1997). The Effect of Beach Nourishment with Aragonite versus Silicate Sand on Beach Temperature and Loggerhead Sea Turtle Nesting Success. *Journal of Coastal Research*, 13, pp.904–915.
- Rumbold, D.G., Davis, P.W. & Perretta, C. (2001). Estimating the Effect of Beach Nourishment on Caretta caretta (Loggerhead Sea Turtle) Nesting. *Restoration Ecology*, 9(3), pp.304–310.
- Witherington, B.E. (1992). Behavioural Responses of Nesting Sea Turtles to Artificial Lighting. *Herpetologica*, 48, pp.31–39.

# Should we 'queer' GIS?

Fiona Blackwood, Fourth Year Geography

*Abstract* – GIS, or Geographical Information Science, has traditionally been seen as incompatible with queer theory because of its lack of fluidity, demonstrated in Brown's (1995) critique of the mapping of HIV/AIDS within medical geography. However, queer theory can arguably be critiqued as being inaccessible, with an emphasis on high theory which can be difficult to engage with, particularly for those outside of academic institutions. GIS has been shown to be a powerful tool, and this paper argues that queer theory should seek to find ways to engage with it in order to enable a greater focus on activist research. There are examples of this being done effectively (Brown and Knopp, 2008), demonstrating how 'queering', or problematising, the process of using GIS by making it more participatory can be a productive process, and the outcome used as a tool in further discussions. There have also been calls to 'queer' the technology of GIS, in addition to how it is used (Gieseeking, 2017). Rather than reject GIS outright, queer theory should seek to engage with it, and through that process critique, challenge and improve the possibilities for its use.

GIS, or Geographical Information Science, has its roots in spatial science, and as a result queer theory has traditionally been reluctant to engage with this methodology. This essay will argue that GIS is too valuable a resource not to be utilised by queer theory, and that rejecting it only limits queer theory's ability to re-imagine society and excludes those lacking the resources arguably needed to engage with the literature around it. Instead, queer theory should aim to 'queer' the process of GIS, expanding the possibilities for its use and engaging with it differently to build a greater focus on activism into the research.

Queer theory began in the humanities in the 1990s, expanding into geography as a social science soon afterwards, but drawing on earlier works by authors such as Foucault. The term is used to refer to both literature surrounding gay and lesbian studies, but queer theory as referenced in this piece relates to the epistemologies of poststructuralism and postmodernism, seeking to challenge, or 'queer', society's assumptions around gender and sexuality (Brown, 2009). GIS, and indeed quantitative methods in general, can be seen as epistemologically different given queer theory's emphasis on fluidity. This contrasts with the requirements of GIS that data becomes fixed into categories.

Brown (1995) is arguably best known for asserting the epistemological difference between GIS and queer theory. He argued that the mapping of HIV/AIDS by medical geographers such as Gould (1993) was over-simplistic, denying agency to those with HIV, and reducing them to vectors of the virus (Brown, 1995). Indeed, he suggests that, in failing to recognise how research can be distancing, in this case of those with HIV/AIDS, their autonomy is erased, denying the complexity of human life more generally. Furthermore, Brown argues that it potentially misrepresents the way in which HIV is spread. While his points are clearly valid and well-presented, it could be argued that too much emphasis is placed upon his critique of GIS itself, and not enough on the impact of distance in both quantitative and qualitative research. Focusing on the former frames GIS as entirely incompatible with queer theory, something that should be challenged rather than taken as fundamentally given. While many use Brown's (1995) paper to argue that queer theory should not engage with GIS, some of the points within it can be applied to the methodology, allowing a more critical and productive conversation around it rather than shutting it down (Brown and Knopp, 2008).

In addition, I would strongly agree with the argument posed by Kobayashi (1994), that research is fundamentally connected to politics, and can and should be used to enact social change. There needs to be more of an emphasis on activism in research. I am somewhat sceptical about theorising on the world if one does not seek to change it, and I think this critique is very relevant to academic queer theory's emphasis on high theory over methodology. High theory can be, quite frankly, exclusionary. As someone of reasonable intelligence and exposure to academic writing, I find it very difficult to even read, let alone apply, work by the likes of Wendy Brown (1995) and Judith Butler (1993). I am in the immensely privileged position of being a student at the University of St Andrews, with access to these resources and the support to engage with them, but this is not something that many are able to benefit from, given the lack of racial diversity within the discipline of Geography, and the disproportionate representation of the middle class in higher education institutions such as this. When so few can afford even to access the work of these scholars, let alone actually engage with their arguments, the reach and

impact of queer theory becomes limited. Engaging with this sort of literature is clearly beneficial, and I have learned a huge amount and had my world view challenged by doing so, but not enough emphasis is placed on the fact that this is a privilege available to few.

Maps, on the other hand, have widespread social power. In the process of producing maps, choices are made about how to represent the three-dimensional world in a simplified two dimensions. The most widespread means of presenting the world in a map uses the Mercator projection, and while it is recognised that there is no singular fallible way to represent the world in two dimensions (Robinson and The Committee on Map Projections, 2017), it nonetheless has an impact on how many people conceptualise the world. This is evident in the debate around the use of the Peters map over the Mercator, where the Mercator projection has been criticised for being Eurocentric because of the relative sizes of areas away from the equator (Monmonier, 2004). Maps have also been used as tools in social projects such as 'Lives on the Line' (Cheshire, 2012). This interactive map of the Transport for London network shows the life expectancy of those living in the vicinity of each Underground, Overground and Docklands Light Railway (DLR) station, helping to challenge, and indeed queer, perceptions of inequality in London. Arguably, this 'ivory tower' of high theory academia is not limited to queer theory by any means and needs to be challenged more generally. However, given queer theory's focus on social justice, it is particularly crucial that it does not outright reject this sort of methodology, if it wants to result in tangible social change. GIS should therefore be 'queered' in order to allow for a greater emphasis upon activism in research.

While GIS has been problematised in relation to queer theory, there are some excellent examples of how the technology has been 'queered', or used differently, to very positive effect. In contrast to Brown's earlier paper, Brown and Knopp (2008) outline the way in which GIS was used by a community group to produce a map that queered the spatial history of Seattle by recognising the existence of LGBT sites. Firstly, this demonstrates how GIS can be used within social justice projects, not without problems – as the authors discuss – but to good effect, challenging the notion of an insurmountable conflict between queer theory and GIS. Secondly, and perhaps more importantly, it demonstrates that GIS can be used as a tool to build communities, and with that to restructure space, as the participatory nature of the project allowed different

people to engage with the topic in new and inspiring ways. Indeed, even the product of the map itself can be seen as a tool to aid further discussion rather than an end in itself, with the potential to spark further contestations about memories or the choice of how to represent sites and communities, continuing the discourse beyond the nominal completion of the project. This demonstrates how seeing GIS as a complex process, rather than something that seeks to make the world static, and queering this process by making it more participatory, creates the potential to significantly challenge the status quo and place greater emphasis upon activist research.

Moreover, GIS itself can be re-conceptualised and 'queered' rather than outright rejected, by queering both the technology itself and its use. Gieseking (2017) argues for the use of 'good enough' technology and programmes in particular projects as a means of 'queering' GIS, by challenging the limits to its access by community groups and others due to knowledge and licencing. The Environmental Systems Research Institute (ESRI) is the dominant producer of GIS software, and their products are seen as the industry standards, but this is in part because they offer very cheap software to educational institutions, so the workforce and activists of the future are taught how to use their products. This industry standard can be 'queered' by using free or open source programmes, such as QGIS. By broadening access to the technology, what it is used for can be transformed, from the stereotype of drone software to social justice projects. In this way, if activism and social change are to be embraced, queer theorists and scholars arguably have a responsibility to queer GIS in order to expand the potential of this hugely powerful tool.

In conclusion, while queer theory has historically problematised GIS, this needs to be done in a more productive way in order to harness the use of the technology. I would go so far as to say that it would be foolish not to engage with, given its power in enacting real-world change and challenging entrenched perceptions. While limitations of the methodology make it somewhat problematic, as Brown and Knopp (2008) argue, it is better to produce something imperfect that can be critiqued, challenged and improved than to produce nothing at all. The 'queering' of GIS seen in this paper, and Gieseking's (2017), should therefore be extended.

## REFERENCES

- Brown, M. (1995). Ironies of Distance: An Ongoing Critique of the Geographies of AIDS. *Environment and Planning D: Society and Space*, 13(2), pp.159–183.
- Brown, M. (2009). Queer Theory. In D. Gregory, *The dictionary of human geography*. (5th ed.). [Online]. Oxford: Blackwell Publishers. Available from: [https://search.credoreference.com/content/entry/bkhumgeo/queer\\_theory/0?institutionId=2454](https://search.credoreference.com/content/entry/bkhumgeo/queer_theory/0?institutionId=2454) [Accessed: 17.01.2019].
- Brown, M., and Knopp, L. (2008). Queering the Map: The Productive Tensions of Colliding Epistemologies. *Annals of the Association of American Geographers*, 98(1), pp. 40-58.
- Brown, W. (1995). *States of Injury: Power and Freedom in Late Modernity*. Princeton: Princeton University Press.
- Butler, J. (1993). *Bodies That Matter: On the Discursive Limits of "Sex"*. New York: Routledge.
- Cheshire, J. (2012). Lives on the Line: Mapping Life Expectancy Along the London Tube Network. *Environment and Planning A*, 44(7), pp. 1525-1528.
- Downs, R. M., Liben, L.S., and Palermo, D.S. (1991). *Visions of Aesthetics, the Environment & Development: the Legacy of Joachim F. Wohlwill*. New York: Psychology Press.
- Gieseking, J. J. (2017). Operating anew: Queering GIS with good enough software. *The Canadian Geographer / Le Geographe canadien*, 62(1), pp. 55-66.
- Gould, P. R. (1993). *The Slow Plague: A Geography of the AIDS Pandemic*. Oxford, UK: Blackwell Publishers.
- Kobayashi, A. (1994). Colouring the Field: Gender, "Race," and the Politics of Fieldwork. *The Professional Geographer*, 46(1), pp.73-80.
- Monmonier, M. (2004). *Rhumb Lines and Map Wars: A Social History of the Mercator Projection*. Chicago: The University of Chicago Press.
- Robinson, A.H. and The Committee on Map Projections (2017). Which Map Is Best? Projections for World Maps. In: M. Lapaine, and E. L. Usery (eds.) *Choosing a Map Projection*, Lecture Notes in Geoinformation and Cartography. Cham: Springer. Ch.1.

# The Silent Killer: Smog in Poland

Iga Józefiak, Fourth Year Sustainable Development

**Abstract** – Out of the 50 most polluted cities in the European Union, 33 are located in Poland. Last winter, Poland was announced to be “the China of Europe”, referring to its pollution. At one point, Warsaw had the most toxic air in the entire world. The smog is silently killing the Polish population, but the government fails to take appropriate steps to combat the tremendous problem of air pollution. This article presents possible solutions using environmental economic tools. It explains the contribution of three main culprits: transport, industry, and households; and discusses governmental actions, which could be taken to prevent further environmental and social damages caused by smog.

The winter is approaching Poland, and together with gradually descending temperatures comes the recurring problem – smog. The World Health Organisation (WHO) Report (2016) clearly proved Polish infirmity – out of the 50 most polluted cities in the European Union, 33 are located in Poland. Last winter, Poland was announced to be “the China of Europe”. During a one day measure, Warsaw had the most toxic air in the entire world. Particulate matter (PM10 and PM2.5) standards were exceeded by more than 3000% (Wantuch, 2017). According to the European Environment Agency Report (2016), Poland’s poor air quality causes 48,000 premature deaths every year and shortens each person’s life by 9 months. Silesian cities inhabitants inhale the amount of toxins comparable to smoking 7 cigarettes a day. The smog is silently killing the Polish population.

The problem of smog in Poland has been rising for many years and successive governments have marginalised it. The main reason for this lies in the Polish economy’s dependency on coal (Szypulski, 2017). Low-stack emission (defined as the emission of harmful dust and gases from transport, households, and industry at the height of no more than 40 m) is the culprit of smog in this region (Kaczmarczyk, 2015). Poland’s roads have become more congested and the industry lacks proper coal regulations. However, the real source of the problem appears during the heating season when households start to burn coal, trash, and other cheap materials in old-generation stoves, which are inefficient and emit large amounts of pollutants into the atmosphere.

Smog is an example of *negative externality* in Poland due to

an excessive and unwise use of natural resources and due to failing to assign the correct price to the use of these resources. Smog exists as a result of the *market failure*, which is caused by lack of property rights – nobody owns clean air, but everyone can use it because it is a public good (it is non-excludable, which means no one can be prevented from using it, and non-rivalrous, which means that consumption of one person does not reduce the ability of other people to consume it). However, when air gets very polluted, it becomes a common-pool resource (still non-excludable but rival). In such situation, behaviour of Polish citizens can be described using the economic term the *Tragedy of Commons* (Hardin, 1968). People acting in their own best interest collectively result in smog and exhaust the level of clean air available to others.

There are different sources of pollutants in Poland, therefore various economic methods should be used in order to solve the problem of smog.

## Transport

31% of cars on Polish roads are more than 20 years old and fail to meet basic Euro emissions standards (GIOŚ, 2017). *Command and control regulation* (CAC), namely the appropriate legislation clearly stating what level of emission is admissible, would help to combat smog. The car owners would be obliged to have a regular service of their vehicle and would receive a sticker certifying that ecological standards had been met. *Pigouvian Tax* (tax put on market activity, which generates negative externality) for the entrance to the Central Business District of the city could also help to reduce pollution and traffic. The higher tax for cars with poor exhaust technology would be an economic incentive for them to improve. *Double dividend* (a positive side effect) would improve the environment and offset distortionary taxes (collected taxes could be used to benefit the society in other ways).

## Industry

80% of Polish electricity comes from coal-burning (Kaliski *et al.*, 2012). Industries often lack proper regulation on the quality standards of coal, which could be solved by proper legislation (CAC). *Cap-and-trade* solution could be pivotal in managing the problem of excessive emission. In this case, a fixed amount of pollution would be set and firms

would trade their pollution permits on the market. In this manner, a value would be placed on the good, which previously had no price. Permits would need to be well-defined and scarce and could be auctioned off or allocated to the firms for free (*grandfathering*).

### Households

There is lack of regulation on the quality of coal sold to individuals and lack of environmental education, which leads to extensive burning of coal and trash to heat houses. Command and control regulation including replacement of old stoves and thermomodernisation (insulation of buildings) is the best possible solution. The proper legislation should be followed by well-functioning control activities and severe fines for non-compliance with environmental standards. Coal sold to individuals should be also appropriately taxed to enhance searching for more sustainable solutions and improving defective, inefficient stoves.

The most significant benefit of taking the aforementioned actions is the protection of our and future generation from toxic air. Elimination of smog will significantly contribute to the improvement of health. Command and control regulation of transport seems to be feasible (e.g. in Berlin) and would significantly reduce air pollution in the crowded CBD. Society, however, tends to be unfavourable in case of taxes. They would also make private companies and services located in the city centre lose clients. The most important way of combating smog in Poland would require the industry to become less dependent on coal. The tradable pollution permits system is said to be the most cost-effective way of environmental protection (Hanley *et al.*, 2013) and would allow efficiently controlling the level of coal emissions, however, there is a problem of initial allocation mechanism of permits.

The problem of smog in Poland accumulates during winter because of trash and coal burning in households. This problem is particularly difficult to be solved because of lack of appropriate control instruments. Moreover, some households cannot afford improvement of technology. Coal tax could be an incentive to switch to renewables but undesirably could enhance people to burn trash and cheaper material.

Currently, the Polish government is working on creating

proper legislation. Moreover, it is financing replacement of old technology in poor, rural areas. Authorities of Cracow are considering imposing an environmental tax on the car access to the city centre. A few times due to smog public transport in Warsaw and Cracow was free of charge. Currently, Poland is far behind other European countries in terms of air quality, therefore the situation needs to be solved and proper actions must be taken in order to protect the whole European population from toxic, spreading air.

### REFERENCES

- European Environmental Agency (2016). Air Quality in Europe – 2016 Report. Luxembourg: Publications Office of the European Union, 2016 [online at: [https://www.google.pl/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&ved=0ahUKewjT6sCB6\\_XAhXOIIAKHVbDDROQFghIQAQ&url=https%3A%2F%2Fwww.eea.europa.eu%2Fpublications%2Fair-quality-in-europe-2016%2Fdownload&usq=AOvVaw0W9LCKGQ04ONSNk9\\_7cKzA](https://www.google.pl/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&ved=0ahUKewjT6sCB6_XAhXOIIAKHVbDDROQFghIQAQ&url=https%3A%2F%2Fwww.eea.europa.eu%2Fpublications%2Fair-quality-in-europe-2016%2Fdownload&usq=AOvVaw0W9LCKGQ04ONSNk9_7cKzA)] [Accessed: 04.11.2017].
- Główny Inspektorat Ochrony Środowiska (2017). Stan Środowiska w Polsce – sygnały 2016. Biblioteka Monitoringu Środowiska. Warsaw.
- Hanley N, Shogren J and White B (2013) Introduction to Environmental Economics, 2nd edition. Oxford University Press.
- Hardin, G. (1968). The Tragedy of the Commons. Science 162 (3859): 1243-1248.
- Kaczmarczyk, M. (2015). Niska emisja – od przyczyn występowania do sposobów eliminacji. Kraków: Geosystem Burek, Kotyza s.c. p.144.
- Kaliski, M. Nagy, S. Siemek, J. Sikora, A. Szurlej, A. (2012). Natural Gas in Poland and the European Union. [online at: <http://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-article-BSL2-0026-0128>] [Accessed: 05.11.2017].
- Szypulski, P. (2017). Smog – is it better or worse? The history of smog in Poland. [online at: <http://www.ekologia.pl/srodowisko/ochrona-srodowiska/problem-smogu-w-polsce-to-nie-jest-nowa-rzecz-wywiad-z-pawlem-szypulskim-z-greenpeace-polska,22446.html>] [Accessed: 03.11.2017].
- Wantuch, D. (2017). Polacy duszą się smogiem. To już nie są żarty! Normy przekroczone nawet o 3 tys. proc. Gazeta Wyborcza. [online at: <http://wyborcza.pl/7,75398,21221597,polacy-dusza-sie-smogiem-to-juz-nie-sa-zarty-normy-przekroczone.html>] [accessed on: 05.11.2017].
- World Health Organization (2016). Most polluted cities and town in the EU. [online at: <https://pbs.twimg.com/media/CyIT4l4WIAEpzuF.jpg:large>] [Accessed: 04.11.2017].



# Encyclopaedia Entry: Moraines

Eleri Griffiths, Fourth Year Geography

*Abstract* – Moraines are important indicators of past glacier and ice sheet extents and dynamics. As landforms that exist all over the world in a wide variety of shapes and forms, interpretations and theories surrounding moraines vary widely. However, the scientific community agrees that moraines form through a variety of processes that involve glacial interactions with sediments. This encyclopaedia entry utilises current scientific knowledge on different types of terrestrial moraines to explain their formation processes and significances, and their important role in understanding locations and behaviours of past glaciers and ice sheets.

## 1. INTRODUCTION: DEFINING MORAINES

Moraines are ridged or mounded accumulations of sediment and debris that occur in marginal and proglacial areas. They are formed through processes of pushing or dumping (Evans, 2013b). Moraines can be classified in different ways. Some examples include Rogen/ribbed moraines, which although they are identified as moraines, are more closely related to drumlins due to similar depositional formation processes and their indication of ice flow direction (Benn and Evans, 2010). Another category includes subaqueous and ice shelf moraines, which provide useful records on marine terminating glaciers (Evans, 2013a). However, this encyclopaedia entry will focus on the two main types of terrestrial moraines: ice marginal moraines and hummocky moraines.

Ice marginal moraines form on the lateral or terminal margins of ice masses (Barr and Lovell, 2014). They mark changes in former glacier dimensions over time, which provides useful information for glacial reconstruction and palaeoclimatic inferences (Barr and Lovell, 2014).

i)

Hummocky moraines are generally defined as irregularly rounded geomorphological features that exist in varying degrees of order, from chaotic to linear (Evans, 2013a). The formation and causes of hummocky moraines are under continued debate, but are thought to form from debris-covered ice cores that have been deposited by a retreating glacier and left to melt. These moraines are generally interpreted as illustrations of the dynamics of glacial recession (Evans, 2013a).

ii)

iii)

## 2. ICE MARGINAL MORAINES

Ice marginal moraines are accumulations of subglacial, englacial, or supraglacial debris that have been transported to the margins of a glacier and pushed or dumped into ridge-like formations. These structures mark the edges of the glacier as it recedes (Barr and Lovell, 2014). Push moraines are small ridges (usually less than 10 meters high) that occur when a glacier advances and ploughs subglacial sediment into proglacial mounds (Evans, 2013a). These landforms commonly appear in sawtooth patterns which indicate their formation along crevassed glacier termini (Colgan, 2013). Dump moraines are a result of supraglacial debris moving through an ice mass to its margins, which is then deposited and builds up on stationary or retreating ice margins (Evans, 2013a). Lateral moraines and terminal/end moraines are the location-based classifications of push and dump moraines (Barr and Lovell, 2014).

These landforms shed light on processes that operate on the margins of advancing, stationary, and retreating glaciers, helping to piece together former glacial limits and patterns of retreat (Ingólfsson *et al.*, 2016). With this knowledge, a more complete understanding of individual glacier characteristics and dynamics can be established through reconstruction, providing evidence for the palaeoclimatic conditions in which these glaciers existed.

### a. Lateral Moraines

Lateral moraines are a result of ice flow exerting push or dump processes on lateral margins of glaciers, and have two main modes of formation: superposition mode and accretion mode (Kirkbride and Winkler, 2012).

#### *Superposition Mode*

Successive glacier expansions overlie the existing lateral moraine, and a single higher moraine which represents a main period of advance eventually remains due to the continuous build-up of debris (Kirkbride and Winkler, 2012).

#### *Accretion Mode*

Lateral accumulations of sediment form individual nested ridges that provide records of individual advances within

a wider period of overall expansion (Kirkbride and Winkler, 2012).

Lateral moraines are particularly useful for establishing a former glacier's equilibrium line altitude (ELA), because ice flow – the process through which lateral moraines are ultimately formed – only occurs in the ablation zone (Nesje, 2013). Thus, the highest lateral moraine in a previously glaciated area theoretically marks the maximum extent of the former glacier at the location of its ELA (Nesje, 2013). However, especially with faster flowing ice, englacial material may not reach the ice surface immediately and be deposited directly at the ELA. In this case, it is more likely that a lateral moraine would form well below the actual ELA. On the other hand, if ice flow and glacial retreat is slow, the ice margins will continually build up debris in the same location, which may reach above the ELA (Nesje, 2013).

Therefore, while lateral moraines provide useful information, they are part of a complex glacial system which is still being demystified. Thus, it is important to also consider other factors like ice flow rates when dating lateral moraines to specific periods of advance or retreat.

#### b. Terminal/End Moraines

End moraines are located at glacial termini, and give insights into the dynamics of glaciers, particularly ones with rapid ice flow (Ingólfsson *et al.*, 2016). Push moraine formation is the dominant form of end moraine development, which implies an active glacier front during seasonal stages of expansion (Kirkbride and Winkler, 2012). There are several types of end moraines, including sharp-crested moraines and broad-crested moraines (Ingólfsson *et al.*, 2016).

##### i) Sharp-Crested Moraines

These landforms occur in areas with fine-grain sediments. The locations of these landforms suggest that high porewater pressure in subglacial sediment, which causes the separation of sediments from the bedrock, is the primary mechanism of ice flow that creates these moraines (Ingólfsson *et al.*, 2016).

##### ii) Broad-Crested Moraines

These features commonly exist as stacked and thrust sheets of coarser sediment. This sediment is unable to support high porewater pressure, which means that bed

deformation is the mechanism of ice flow (Ingólfsson *et al.*, 2016).



Figure 1: Small end moraines formed by push processes in the proglacial field of Breiðamerkurjökull. Source: (Colgan, 2013, 806).

Breiðamerkurjökull, a large outlet glacier in southeast Iceland that drains from Vatnajökull icecap is a prime example of how end moraines have recorded glacier recession over time (Colgan, 2013). A large end moraine marks the maximum extent of Breiðamerkurjökull, which occurred during the Little Ice Age, and is dated to approximately 1894. Since 1894, Breiðamerkurjökull has retreated about 4.5 km and the deglaciated area in front of the modern glacier consists of numerous smaller end moraines (Colgan, 2013). These small moraines formed during winter readvances were preserved by summer melting, which was greater than the previous winter's readvance. At this site, the small end moraines are dated to nearly every year since 1965, and are excellent records of the seasonal fluctuation and overall retreat that Breiðamerkurjökull has been experiencing in response to recent climatic changes (Colgan, 2013).



Figure 2: Hummocky moraines formed by the recession of Tungnaárjökull in Iceland. Source: (Evans, 2013a, 774).

### 3. HUMMOCKY MORAINES

Hummocky moraines are widely thought to originate as subglacial accumulations of sediment-covered ice that emerge from beneath the snouts of actively retreating glaciers (Benn and Evans, 2010). As a glacier recedes, it creates proglacial areas of debris-covered ice cores (Kirkbride and Winkler, 2012). These icy mounds of debris are also known as controlled moraines (Evans, 2009). The ice gradually melts, leaving the debris in its place. These remaining mounds are known as hummocky moraines (Evans, 2009). Hummocky moraines can exist in chaotic or linear patterns depending on the debris distribution of the glacier from which they originate, and how the debris was redistributed during ice melt (Evans, 2013a).

As an identifying landform, hummocky moraines encompass a variety of geomorphological features that form from depositional processes involving both active and stagnant ice (Evans, 2013a). This broad, inclusive definition continues the debate on the ability for hummocky moraines to serve as evidence of past glacier recession dynamics.

Despite this uncertainty, hummocky moraines are widely acknowledged to be caused by glacial retreat, and can provide valuable insights into this process (Benn and Ballantyne, 2005). Continuous or closely spaced hummocky moraines may indicate that a glacier remained close to its climatic equilibrium during retreat. In these cases, the glacier is likely to have experienced slower melting in response to gradual climate change (Benn and Ballantyne, 2005). On the other hand, the absence of hummocky moraines may imply faster glacial melt, possibly as a result of more rapid climate change (Benn and Ballantyne, 2005).

Kvíárjökull, a temperature outlet glacier of Öraefajökull ice cap in Iceland, demonstrates the complex processes surrounding hummocky moraines. In the inner proglacial environment, controlled moraines are spread in a linear pattern due to ice marginal pushing, which shows that Kvíárjökull was effectively balanced with its regional climate during this process (Evans, 2009). Further out in the proglacial field, older and more chaotically distributed hummocky moraines reflect the duration of glacial processes and concentrations of englacial debris that formed them, as well as the effects of glacial-fluvial erosion on geomorphological features (Evans, 2009).

### 4. SIGNIFICANCE

Glaciers, due to their sensitivity to air temperature, precipitation rates, and solar radiation are excellent indicators of past and present climate changes (Colgan, 2013). Their various patterns of retreat create and expose landforms that provide important evidence regarding the causes and dynamics of these recessions. Moraines mark past lateral and terminal edges of glacier extents over time, and also suggest glacial retreat rates and dynamics. This information allows for reconstructions of past glaciers and their environments, which can then be used as analogues to predict how glaciers might respond to future climate change (Barr and Lovell, 2014). With Earth's currently warming temperatures, glacier recession is occurring on a global scale (Colgan, 2013). Thus, geomorphological features like moraines provide vital information about what these climatic changes will mean for the world's glaciers.

### REFERENCES

- Barr, I. D. and Lovell, H. (2014). A review of topographic controls on moraine distribution. *Geomorphology*, 226, pp. 44–64.
- Benn, D. I. and Ballantyne, C. K. (2005). Palaeoclimatic reconstruction from Loch Lomond Readvance glaciers in the West Drumochter Hills, Scotland. *Journal of Quaternary Science*, 20, pp. 577–592.
- Benn, D. I. and Evans, D. J. A. (2010). *Glaciers and Glaciation*. Routledge, London. pp. 802.
- Colgan, P. M. (2013). Evidence of Glacier Recession. In: Elias, S. (ed) *The Encyclopaedia of Quaternary Sciences*, 1, pp. 803–812.
- Evans, D. J. A. (2009). Controlled moraines: origins, characteristics and palaeoglaciological implications. *Quaternary Science Reviews*, 28, pp. 183–208.
- Evans, D. J. A. (2013a). Moraine Forms and Genesis. In: Elias, S. (ed) *The Encyclopaedia of Quaternary Sciences*, 1, pp. 769–779.
- Evans, D. J. A. (2013b). Glacial Landsystems. In: Elias, S. (ed) *The Encyclopaedia of Quaternary Sciences*, 1, pp. 813–824.
- Ingólfsson, Ó., Benediktsson, Í. Ö., Schomacker, A., Kjær, K. H., Brynjólfsson, S., Jónsson, S.A., Korsgaard, N. J., and Johnson, M. D. (2016). Glacial geological studies of surge-type glaciers in Iceland — Research status and future challenges. *Earth-Science Reviews*, 152, pp. 37–69.
- Kirkbride, M. P. and Winkler, S. (2012). Correlation of Late Quaternary moraines: impact of climate variability, glacier response, and chronological resolution. *Quaternary Science Reviews*, 46, pp. 1–29.
- Kirkbride, M. P. and Winkler, S. (2012). Glacial geological studies of surge-type glaciers in Iceland — Research status and future challenges. *Earth-Science Reviews*, 152, pp. 37–69.
- Nesje, A. (2013). Paleo-ELAs. In: Elias, S. (ed) *The Encyclopaedia of Quaternary Sciences*, 1, pp. 909–917.

# An Analysis of Arturo Escobar's (1995) 'Encountering Development: The Making and Unmaking of the Third World'

Laura Goldie, Fourth Year Geography

*Abstract* — This essay analyses post-development writer Arturo Escobar's work 'Encountering Development: The Making and Unmaking of the Third World'. Escobar's work has had a huge influence on development, with some arguing that his work on post-development brought development studies to an end. However, his work has provoked much critique for reproducing the ideas of development which are criticised in his work. Throughout this critical analysis, the pre-conceived ideas of development are highlighted. As Geographers, we think that we are familiar with the term development. However, through Escobar's critique, it became apparent to me that our ways of seeing development have been socially constructed. This essay has been eye-opening for me as a fourth year Geography student as it has allowed me to utilise the critical analysis skills which I have acquired over my time at University.

Columbian-American anthropologist Arturo Escobar has a highly complex and emotive relationship with development. His work critiques the outlook that development will solve the issues of third world countries, expressing the ways in which development discourse has socially constructed the measures that will benefit these countries, and stating that development is essentially the cause of the oppression of the "Third World". In chapter 4 of *Encountering Development: The Making and Unmaking of the Third World*, Escobar (1995) relates the ideas of the development discourse to the subject of hunger and food dependency in developing countries. He discusses the downfall of Food and Nutrition Policy and Planning schemes created by several United Nation agencies, with a particular focus on Colombia. However, whilst Escobar highlights the extent to which development is a construct that is exclusive and technical, he is inattentive of the ways in which his writing succumbs to the style of development which he attempts to avoid. Throughout this essay, I will analyse Escobar's use of language, contradiction, context, positionality and authority, and the ways in which these traits reproduce the ideas of development discourse.

## Production of Knowledge

Escobar begins by describing the hierarchical systems of knowledge that constitute development discourse,

exemplifying the social construction of "peasants" (107). The idea of a peasant is constructed by institutions of higher power to control how individuals in third world countries are perceived by the rest of the world. Those who occupy this space of authority have the power to create objective knowledge which can be reproduced as factual discourse. Haraway (1988) describes this as the 'God Trick': the power to see everything from nowhere. Escobar shows how development is exclusive and technical as the discourse excludes those in third world countries as potential knowledge producers.

Throughout, Escobar exaggerates the post-structuralist idea of Stand Point Theory: the need to gain opinions from the subjugated as their knowledge will not be impacted from hierarchical and objective ideologies. However, he shows that institutions believe that they are the only ones equipped to deal with the issue of hunger (111). Escobar both exaggerates and eliminates the importance of the opinions of the subjugated as he continues to favour the knowledge of the educated and the superior. Thus, hunger is seen as a problem which can be dealt with by development alone.

## Construction of Categories and Problems

Escobar goes on to identify that the problems of the third world which are perceived in development discourse have been created through institutional power, with the outlook that they can be solved by development. This is achieved through the process of categorisation (e.g. peasants), which allow institutions to control and essentially rate each group according to a development scale. Escobar shows this through the example of the *Desarrollo Rural Integrado* (DRI) scheme in Colombia. One of the aims of this scheme was to create a "national poverty map" (134) in order to identify the poorest 30% of people. Experts claimed that this would be helpful as it would allow the poorest individuals to benefit directly. However, while the scheme is marketed as helping the poor, it is structured in such a way that institutions will primarily benefit from it, constituting another way for them to exert their power. Mapping and categorising groups of individuals from an objective perspective

essentially de-humanises them, allowing for superior powers to treat them as statistics (Brown, 1995). Escobar shows that development discourse creates these groups so that they can be targeted with development schemes (121).

### **Third World Countries as the Victims**

That having been said, in critiquing development discourse, Escobar succumbs to the very mechanisms he is trying to problematise. The way in which Escobar discusses issues of third world countries is paternalistic and slightly patronising. He portrays these individuals as being almost helpless and in need of change in order to encourage development as a socially constructed goal. He frames his argument as a promotion of values such as self-sufficiency and local agency. However, in doing so, he characterises those in the third world as vulnerable and incapable of making their own decisions. For example, Escobar uses emotive language such as 'sad theatre of hunger' (124) which allows the reader to empathise with and pity these people. Therefore, Escobar reproduces the ideas of development, as he is creating a sense of power over these individuals and asserting himself in a position of authority. This is evident in his example of Colombia and the implementation of the Food and Nutrition Policy and Planning (FNPP) strategy. Escobar provides very little context as to why Colombia was chosen for this scheme and the extent of Colombia's local agency prior to the scheme. By doing this, Escobar is following the steps of development experts in deciding what information to reveal to the reader.

### **Undermining the Power of Development**

Although the idea of local agency and local social movement can be helpful in promoting the development of third world countries, Escobar underestimates the power of development discourse and institutions. As Escobar is outraged with the idea of macro-level solutions, he devotes his attention to local-level participatory methods and agency. He describes this as the only way to move away from modern development schemes. However, he does not provide any evidence or guidance as to how members of third world countries are able to avoid the higher powers of development. Escobar's delusion of the power of development has led him to create a new discourse which allegedly has no influence from macro-level development schemes. This is a flaw on Escobar's behalf to believe that any country can be removed from the idea of development. Escobar's

immutable attitude towards development creates a pessimistic tone throughout the chapter; he does not provide any hope for the prospect of local agency and macro-level solutions working together in the future, which seems to be a highly unlikely scenario.

### **Issues of Positionality**

It is clear that Escobar encounters difficulties with his positionality throughout his research. He shows this through his use of language and contradiction. For example, he utilises the word "analyse" (109) when discussing the matter of third world countries. This promotes a sense of expertise and creates the impression of othering (the act of segregating social groups). He also uses language such as 'we' and 'our', making the assumption that both author and reader are part of the analysis of the people of third world countries. For example, Escobar states: 'to train ourselves to see what culturally we have been taught to overlook' (113). By using this language, Escobar is exemplifying development discourse as he is elevating himself to a position of objective power and expertise, rather than attempting to be subjective. He furthers this contradiction by being aware that 'planners are notorious for not seeing themselves as part of the system for which they plan' (122), although he fails to recognise the irony in the fact that he is doing the very same.

Overall, whilst describing how development can be exclusive and technical, Escobar essentially reproduces the ideas of development discourse and fails to account for his positionality as a researcher. He contradicts his own assertions to not succumb to the flaws of development discourse by producing a chapter which can be viewed as both objective and dismissive to individuals in the third world.

### **REFERENCES**

- Brown, M. (1995) Ironies of Distance: An ongoing critique of the geographies of AIDS. *Environment and Planning D Society and Space*, 13(2), pp.159-183.
- Escobar, A. (1995) *Encountering Development: The Making and Unmaking of the Third World*. Princeton University Press: Princeton.
- Haraway, D. (1988) Situated Knowledges: the science question in feminism and the privilege of partial perspective. *Feminist Studies*, 14(3), pp.575-599.

# A Historical and Palaeoecological Evaluation of the Interactions between Changing Population Settlements and Landscapes During the Black Death

Fiona Banham, Fourth Year Geography

**Abstract** – The mid-fourteenth century saw the Black Death sweep across much of Europe, killing an estimated 30% of the population. Historians have traditionally tended to focus upon the social, economic and political implications of population reductions in the wake of the plague. Equally, it is vital to acknowledge that these demographic shifts may also have had a significant impact upon the continent’s environmental landscape. In turn, environmental factors, such as re-forestation and climate change, may well have driven further alterations in population settlement and migratory trends. However, historians and ecological geographers disagree on the extent to which these relationships have been explicitly causal and one-sided. In recent years, environmentally deterministic depictions – portraying nature as having “taken over” as a result of supposed agricultural abandonment in the aftermath of the plague – have been critiqued for underestimating human abilities to adapt subsistence practices in order to accommodate environmental transformations. The already complex challenge of unravelling past socio-ecological systems is made even more so by methodological constraints, such as the chronological misalignment of historical and palaeoecological timescales. Ultimately, however, cross-disciplinary collaboration is vital in order to strive for greater authenticity in depicting interactions between humans and the environment in the past, present and future.

In 1348, Europe was struck by a continent-wide pandemic which had significant implications for the interactions between human societies and the environmental landscape. Suspected to have been carried by fleas (*Siphonaptera*) infected with the bacterium *Y. pestis* via rats (*Rattus*) on trade ships from East Asia, the Black Death was responsible for significant mortality rates throughout Europe. It is estimated that approximately 30% of the population across the continent was lost as a result of the plague (Langer, 1964). The implications of these demographic changes upon the environmental landscape are therefore likely to have been significant. However, palaeoecological and historical evidence for the potentially causal interactions between population settlement and landscape is fragmentary. The available evidence has resulted in studies reaching an array of often contradictory conclusions.

Firstly, there is an argument to suggest a strongly causal relationship between the population settlement changes and the landscape. There is much evidence to indicate that the significant increase in mortality brought about by the Black Death resulted in the abandonment of arable lands, which were consequently left to the hands of nature. The result was the notable regeneration of woodland cover in Western Europe in the latter half of the fourteenth century. Figure 1 shows a basic conceptual model visually representing the key components of this argument.

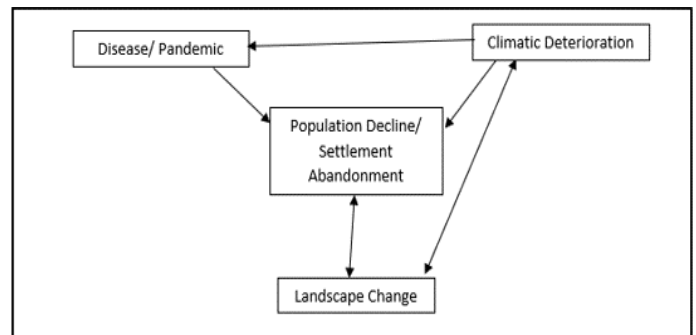


Figure 1: A basic conceptual model to show an environmentally deterministic framework of the causal relationship between pandemic, population decline/settlement abandonment and landscape change. Source: (Banham, 2018).

This has been demonstrated primarily through the use of palaeoecological evidence. For instance, sedimentary records collected from the Auvergne region of France document a rise in arboreal pollen, such as *Alnus* (alder), *Corylus* (hazel) and *Betula* (birch) in the aftermath of the Black Death (Yeloff *et al.*, 2007). In the Netherlands, Van Hoof *et al.* (2006) observed similar declines in cereal pollen to be followed in the record by a proliferation in pioneer species such as *Plantago ianceolate* (ribwort plantain), and subsequently arboreal species including *Fraxinus* (ash), *Ulmus* (elm) and *Betula*. The replacement of cereal pollens such as *Secale cereale* (rye) in these records by herbaceous and, subsequently, arboreal species, is strongly suggestive of a decline in the cultivation of land during the depopulation resulting from the Black Death. This enabled successional processes to take effect, allowing for the

gradual regeneration in vegetation, from pioneer species such as birch, towards climax vegetation, such as oak (*Quercus*) and pine (*Pinus*) (Lagerås *et al.*, 2016). Ruddiman (2003) has taken this thesis even further to suggest that the Black Death caused a shift in global atmospheric CO<sub>2</sub> dynamics, thus accounting for the 10ppm anomaly identified in the Law Dome ice core records (Ruddiman, 2003). This latter turn of the theory is particularly controversial, but is yet to be entirely discredited.

The fact that this argument is derived from a multi-proxy record is one of its main strengths, but it is impossible to prove the existence of a direct causal relationship. It is also highly problematic to make these generalisations about the wider European impacts of the Black Death based on such a small handful of sites (Stebich *et al.*, 2014; Van Hoof *et al.*, 2006). In addition, bold and sweeping theories such as Ruddiman's (2003) seem far too ambitious when based upon such a fragmentary record. A fundamental problem with the ice core records used (notably the Taylor Dome record) is that the resolution is not fine enough to even confirm coincidence of the CO<sub>2</sub> anomaly and the Black Death, let alone causality. The record's chronological uncertainty of ±100 years means that the anomaly could even have occurred before the Black Death, or too long afterwards to have been a direct consequence (Van Hoof *et al.*, 2005). This highlights a fundamental problem of human and ecological timescale misalignment when attempting to combine different types of records of landscape and population change. Another fundamental drawback is that this argument appears to be disproportionately environmentally deterministic. Unprecedented progress has surely been made in both scientific and social strands of socio-ecological studies since Hecker (1883) recorded his strong belief that "the powers of nature themselves produce plagues, and subjugate the human will" (Hecker, 1833, 3).

There is therefore a second argument recognising that, although human populations may have declined as a result of the Black Death, nature was not simply permitted to take over abandoned arable lands. Instead, human societies were, to some extent, able to adapt their subsistence practices in order to continue to prosper in the aftermath of the plague. This can be seen predominantly through the conversion of formerly arable lands to pasture and meadowlands for grazing livestock (Lagerås *et al.*, 2016). Indeed, the pollen records show that, despite a decline in the prevalence of cereal pollen in the aftermath of the plague, this was not exclusively replaced by arboreal pollen. Instead of the regeneration of woodland

vegetation, open ground crops and arable weeds became dominant, with *Plantago lanceolata*, for instance, spreading to cover 38% of Swedish land during the fourteenth century (Lagerås *et al.*, 2016). The presence of these grazing-resistant species suggests that rather than abandonment to nature, much of the land left 'vacant' as a result of the increased mortality rates following on from the Black Death was in fact put to use as pastoral land for grazing livestock.

However, this argument can be critiqued for its oversimplification of the relationship between populations and the environment. This is predominantly due to its excessive reliance upon the Black Death as a chronological milestone in the development of population-landscape interactions. As such, it implies an implausibly sudden change in agricultural and migratory practices. In reality, there is much historical evidence to suggest that shifts in landscape-population dynamics were already underway at the beginning of the fourteenth century, and potentially earlier still (Harvey, 1991). This therefore implies that the Black Death did not result in an overhauling of these relationships, but merely an exacerbation of underlying trends which had already been ongoing for decades.

The final argument places focus neither explicitly upon landscape dominance nor population adaptability in the aftermath of the Black Death, but problematises the use of the Black Death as such a strong chronological turning point in human-landscape interactions. It suggests that the trends observed were in fact the result of much longer-term interactions between populations and the environment. Figure 2 shows a significantly more nuanced conceptual model illustrating the complexity of the socio-ecological interactions implicated in this argument.

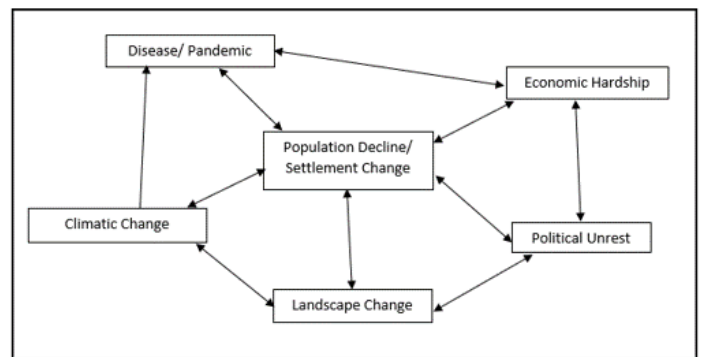


Figure 2: A basic conceptual model showing a more nuanced approach to population-landscape interactions leading up to, and in the aftermath of, the Black Death. Source: (Banham, 2018).

In terms of extraneous environmental drivers, there is abundant evidence from a wide variety of sources to suggest environmental instability during the Middle Ages. The Medieval Warm Period heralded favourable climatic conditions for agriculture, but was superseded by a sharp rise in precipitation totals and a succession of persistently long, wet summers in many parts of North Western Europe. This resulted in an increasing instability of agricultural practices, and has been cited as a likely cause of the Great Famine in 1315, resulting from an inability of populations to cope with declining crop yields as a result of seasonal climatic variability (Campbell and Bartley, 2006). Moreover, studies such as those conducted by Bailey (1991) have noted an increasing number of extreme climatic events during the earlier part of the fourteenth century, including an increase in coastal flooding and storminess in the North Sea (Bailey, 1991; Lamb, 1982). These climatic factors may have combined to reduce the resilience of populations during the fourteenth century to deal with events such as pandemics, meaning that the arrival of the Black Death by 1348 marked a tipping point which resulted in exacerbated impacts upon populations and landscapes.

Economic and political unrest, as linked to climatic disturbances, have also been cited as potential causes of instability in the run-up to the Black Death. The economic recession of the 1330s combined with a reduction in yields as a result of the Little Ice Age to produce what has been referred to as 'land hunger' – a desire to cultivate as much land as possible in the hope of producing more crops at a time of environmental and economic hardship (Harvey, 1991). Postan (1975) has argued that this resulted in the cultivation of increasingly marginal lands in the run up to the Black Death, which were the first to be abandoned in the aftermath of the plague as a result of their relatively unproductive nature. There is a deep paradox exposed by such an argument, which implies that even prior to the Black Death, the landscape enforced a natural 'check' on population and economic expansion. Indeed, there was a limited extent to which the land could be cultivated as a result of natural factors, such as soil quality. However, despite being closer to the environmentally deterministic than the possibilist end of the spectrum, it must be acknowledged that this argument also takes into account an element of poor resource management on the part of medieval populations, treating land as a finite resource.

It can therefore be concluded that, while there is well-supported evidence to suggest that the Black Death resulted in significant declines in European populations, a

combination of a scarcity of data and sharp regional disparities in the existing data mean that sweeping generalisations about the pan-European impacts of the Black Death upon societies and assumptions equating population decline to vegetation regeneration are unwise. When dealing with past human-landscape interactions, an inter-disciplinary approach is vital, and palaeoecological and historical datasets can be correlated in order to enforce some arguments and broaden understandings of past environmental changes. However, there are fundamental methodological problems only just beginning to be addressed, such as mismatching timescales and temporal resolutions between human and ecological processes and records. Greater collaboration between the historical, geographical and ecological academic communities is therefore imperative; only at such a confluence of expertise can a more comprehensive picture of past, present and future socio-ecological interactions be painted.

#### REFERENCES

- Bailey, Mark. 1991. *Per impetum maris*: natural disaster and economic decline in eastern England, 1275-1350. In: Campbell, Bruce M. S. (ed). *Before the Black Death, Studies in the 'crisis' of the early fourteenth century*. Manchester University Press, Manchester. pp. 184-208.
- Campbell, Bruce M. S. and Bartley, Ken. 2006. *England on the Eve of the Black Death, An Atlas of lay lordship, land and wealth, 1300-49*. Manchester University Press, Manchester. pp. 382.
- Harvey, Barbara F. 1991. Introduction: the 'crisis' of the fourteenth century. In: Campbell, Bruce M. S. (ed). *Before the Black Death, Studies in the 'crisis' of the early fourteenth century*. Manchester University Press, Manchester. pp. 1-24.
- Hecker, J. F. C. 1833. *The Black Death in the fourteenth century*. A. Schloss, London. pp. 205.
- Lagerås, Per, Broström, Anna, Fredh, Daniel, Linderson, Hans, Berg, Anna, Björkman, Leif, Hultberg, Tove, Karlsson, Sven, Lindblad, Matts, Mazier, Florence, Ulf Segerström, Ulf and Sköld, Eva. 2016. Abandonment, agricultural change and ecology. In: Lagerås, Per (ed.), *Environment, Society and the Black Death, An interdisciplinary approach to the late-medieval crisis in Sweden*. Oxbow Books, Oxford. pp. 30-68.
- Lamb, H. H. 1982. *Climate, history and the modern world*. Methuen, London. pp. 387.
- Langer, William L. 1964. The Black Death. *Scientific American* 210 (2). pp. 114-121.
- Postan, M. M. 1975. *The Medieval Economy and Society: An economic history of Britain in the Middle Ages*. Penguin, Harmondsworth. pp. 296.
- Ruddiman, William F. 2003. The Anthropogenic Greenhouse Era Began Thousands of Years Ago. *Climate Change* 61. pp. 261-293.
- Stebich, Martina, Brüchmann, Cathrin, Kulbe, Thomas, Negendank, Jörg, F. W. 2014. Vegetation history, human impact and climate change during



the last 700 years recorded in annually laminated sediments of Lac Pavin, France. *Review of Palaeobotany and Palynology* 133. pp. 115-133.

Van Hoof, Thomas B., Bunnik, Frans P. M., Waucomont, Jean G. M., Kürschner, Wolfram M. and Visscher, Henk. 2006. Forest re-growth on medieval farmland after the Black Death pandemic- Implications for atmospheric CO<sub>2</sub> levels. *Palaeogeography, Palaeoclimatology, Palaeoecology* 237. pp. 396-411.

Van Hoof, Thomas B., Kaspers, Karsten A., Wagner, Friederike, Van De Wal, Roderik S. W., Kürschner, Wolfram M., Visscher, Henk. 2005. Atmospheric CO<sub>2</sub> during the 13<sup>th</sup> century AD: reconciliation of data from ice core measurements and stomatal frequency analysis. *Tellus* 57 (4). pp.

351-355.

Yeloff, Dan, and van Geel, Bas. 2007. Abandonment of farmland and vegetation succession following the Eurasian plague pandemic of AD 1347-52. *Journal of Biogeography* 34. pp. 575-582.

# Critical Review: Ikea's FY17 Sustainability Report

Meggie Beattie, First Year Sustainable Development

**Abstract** – Ikea is a world-renowned Swedish corporation producing affordable furniture and home accessories. This multinational company with a turnover of 11 billion euros a year tries to be perceived as an ecologically friendly, concerned about the state of the environment and aware of the concept of sustainable development. It issues annual sustainable reports, aiming to show company's endeavours towards sustainable practices. This critical review will look at the IKEA FY17 sustainability report by relating it to and analysing it against the UN's 17 sustainability goals (17 SDGs) and Hopwood's sustainability mapping (UN 2015; Hopwood *et al.*, 2005). Although Ikea's business model favours plastic products used with ease over sustainable products with longevity, it has put decent sustainable practices into action. As a brand, Ikea has made progress regarding SDGs, however the remaining challenge and a great concern still relates to the consumption.

## Introduction

Ikea was founded in 1942 by the Swedish 17-year-old Ingvar Kamprad, who had started his career as a parcel delivery boy (Bartlett *et al.*, 1990). Now a multinational company with a turnover of at least 11 billion euros a year, Ikea is one of many companies to issue an annual sustainability report. The sustainability report works as a way of showing, celebrating and critiquing how the company approaches sustainable development (SD) but is often only a document that serves to tick industry CSR norms. This critical review will look at the IKEA FY17 sustainability report by relating it to and analysing it against the UN's 17 sustainability goals (17 SDGs) and Hopwood's sustainability mapping (UN 2015; Hopwood *et al.*, 2005). The use of both criteria will hopefully allow this critical review to extend further by looking at Hopwood's sense of interconnectedness, while still addressing the baseline statements of 17 SDGs (UN 2015). Hopwood's sustainability mapping (2005) offers critiques on many schools of sustainable thought and by doing so will inform this critique in a more rounded way. As the 17 SDGs are quoted and mentioned in the report many times, it is important to include them in the evaluation of this report (UN 2015).

The IKEA FY17 deals with sustainability (figure 1) with crossovers of sections representing actual interlinkages of factors between their main ideas and separation where the policies failed to interlink. The report has details of many of IKEA's partnerships with charities and organisations

hence its presence in the centre around IKEA's 2012 Sustainability policy which creates the framework for the report.



Figure 1: A diagram constructed to display the FY17 sustainability report visually. Source: (Beattie, 2018).

## The UN's 17 Sustainability Goals (SDGs)

The IKEA FY17 report uses consumer-friendly SD terminology from the start, the second page touting their 2012 sustainability policy of "planet and people positive" (Ikea, 2017, 2) with page 6 awash with statements about inequality, climate change and future: key aspects of SD present in almost all sustainable development documents. There is even a reference to the sustainability goals in a letter from the CEO of IKEA at that time Jesper Brodin.

"That's why we – like other forward-thinking businesses – are committed to science-based targets. And it's why we fully support the UN's Sustainable Development Goals (SDGs)" this is a strong suggestion of commitment to the goals. The report was found to mention 12 of the 17 sustainability goals (pages 7, 8 & 43) and deals with, in some form, 10 of those in a program. That being said, there is a distinct lack of any form of policy for hunger or poverty, which was a major part of the SDGs (UN 2015). While page 43 suggests that they have dealt with each goal by listing measures under each category; some present tenuous links to the SDGs themselves. An example of

which is the one for hunger and poverty that states IKEA addresses it by "offering healthier and more sustainable food products" which while being a good initiative doesn't exactly tackle hunger and poverty in an active way. As such a large business it is increasingly necessary for the SDGs to be dealt with as best as possible by such a far-reaching company.

### **Inequality and People**

The report says, "We are a member of the Workplace Pride Foundation – an organization that strives for greater acceptance of LGBT+ people in the workplace and in society" (Ikea, 2017, 29). This suggests on paper IKEA supports LGBT+ rights with this display of support being furthered on the same page by detailing how they were a part of discussions to develop the Standards of Conduct for Business on Tackling Discrimination Against LBGT+ people. These actions show tangibly that the company has taken direct action to combat discrimination and demonstrate a proper step in addressing inequality both in the workplace of IKEA but also globally. (Hopwood *et al.* 2005).

Another aspect of Ikea's campaign that looks to address inequality is their programs for refugees: the first of which is an employability scheme in Spain where 16 refugees were offered five-week training programs to enhance their employability. Other initiatives include IKEA Austria taking on 20 and Switzerland committing to create 110 internship opportunities for refugees in the next 3 years. While these are initiatives which uphold the 17 UN SDGs; they are very small scale for such a large company making them feel more for show than a proper push for people and equality. Though one laudable achievement by Ikea is a charity project they have called "brighter lives for refugees", which has raised over 30 million euros for the UNs refugee agency. (IKEA 2017, 36) Inequality in relation to women is a well addressed topic as the report cites good gender equality, with women holding 49% of managerial roles. This aligns well with the SDGs (2015) in relation to gender equality and female empowerment such as in goals 5 and 10 (UN, 2012) as 49% of managerial roles within the company are held by women (IKEA, 2017, 29).

### **Environment**

The report contains a great deal of green environmental policy, such as plans to "create as much renewable energy as the company uses by 2020", a statistic that displays an economic plan for green development. Though this statistic drops down to an 84% goal when IKEAs Sub-

metered tenant consumption was not included (IKEA, 2017). IKEA also includes a solar power installation plan, which further evidences the company's intention towards more sustainable environmental practice.

There are also details in the report about projects to encourage personal sustainability which have been running since 2014 which cites an involvement of around 3,184 customers and 3,697 co-workers. That is only about 0.0062% of its 110 million IKEA family club card holders and 1.5 million co-workers (IKEA, 2017). As of 2002 considering it was the world's biggest furniture retailer (Bartlett, 1990) these figures suggest that it is still more of a pilot project than an active piece of policy with no specific details of plans to expand despite having been running for over 3 years.

Out with the report IKEA itself has plans to phase out single use plastic straws by 1<sup>st</sup> October 2018 and all single use plastic by 2020, this shows initiative within the idea of super wicked problems (SWPs) (Levin *et al.*, 2012; Waddock, 2013) in addressing climate change. The fact that these initiatives were planned with goals set in short time scales means that they are being addressed as problems that time is running out for, like a super wicked problem. Levin *et al.* (2012) detailed this: that super wicked problems are ones that time is running out for and also detailed that "those who cause the problem also seek to provide a solution". This applies to how IKEA's business plan may appear fundamentally unsustainable. This could be perceived by the fact that IKEA currently relies on its cheap prices and items not necessarily built to last, with plastic playing a large role in their past and ongoing commercial success. In line with this the report contains a great deal of waste review, recycling and waste incineration for energy: something integral in their approach that may be classified as 'weak' within sustainable development academia (King *et al.*, 2006). Where weak may be classified as when natural capital is looked at interchangeably with other forms of capital (Hopwood *et al.*, 2005).

### **Interconnectivity and Economy**

The way IKEA addresses sustainability in this report is one that is synonymous with business, an often argued 'weak form of sustainability' and as analysed in (Hopwood *et al.*, 2005) is one that is in relation to "Global orchestration: A globally connected society that focuses on economic growth, global trade and economic liberalization, and takes a reactive approach" (MEA, 2005). Acting towards sustainability while still

maintaining a culture that consumes is often central to company sustainability policy, while IKEA attempts to promote a circular economy in the report it can be argued that green consumption is not enough (Maniates, 2001). A rare example of inter-connectedness within the report though is its emphasis on the items that they sell that are sustainable and/or fair trade. This example works to connect environment, inequality and business. By ensuring products are fair trade, Ikea can properly support business in developing countries by avoiding exploitation and working under fair trade regulations and sustainability regulations. This displays an interconnectedness to their SD policy, something that is often thought to be integral to the future of sustainable development. It addresses goal 12 (UN 2015) and is also an idea that aligns well with the part of the definition of sustainability in (Hopwood *et al.* 2005, 39) “[i]t strongly links environmental and socio-economic issues.”

Though when looking at the document in its entirety it has many short falls: the exaggeration of minor projects, a lack of interconnectivity and no plan for goal 1 of the SDGs (poverty and hunger). The addressing of the last point is one that is integral to proper sustainable development, something that is just as important as economic growth and should be prioritised as such. The emphasis of the place business should play in this development is put well by Blewitt (2014) “In this regard, we consider green economy.... should contribute to eradicating poverty as well as sustained economic growth”.

## Conclusion

The document as a whole relates to a segment of Hopwood *et al.* (2005) where it talks about how Brundtland's ambiguity “allows businesses and governments to be in favour of sustainability without having any fundamental challenge to their present course”. This relates well to IKEA as its business plan hasn't changed, it is a household shop that favours mass produced and plastic using with ease prioritised over longevity. Yet it has put good sustainable practices into action with these efforts bringing about solid change within the company emphasized by their initiatives for a circular economy (WCED, 1987).

As a brand IKEA appears to have made reasonable progress in most SDG goals (2015) though when looked at

from a deeper academic perspective such as with Hopwood's sustainability mapping the progress appears less significant especially in relation to consumption. That being said, with IKEA already planning to update policy in 2018 they are demonstrating the company's commitment to adapting and planning better sustainability goals for their future, which is key especially in how Futurity (continuing existence) (Haughton, 1999) plays its part in Sustainable development.

## REFERENCES

- Bartlett C A, Ashish N. 1990, “Ingvar Kamprad and IKEA”, Harvard Business School Case, pp. 390-132.
- Blewitt J. 2014 “The road to sustainable development”, Understanding Sustainable Development, Routledge, pp. 7.
- Haughton G. 1999. “Environmental justice and the sustainable city”. *JPER* 18: pp. 233-243.
- Hopwood B, Mellor M, O'Brien G, 2005. “Sustainable Development: Mapping Different approaches”. *Sust. Dev.* 13: pp. 38-52.
- IKEA. 2012. “People and Planet Positive: Ikea group sustainability strategy for 2020”. Ikea Group.
- IKEA. 2017. FY17: “Sustainability summary report”, Ingka holding B.V and its controlled entities.
- Kenis A. 2016. “Ecological citizenship and democracy: Communitarian versus agonistic perspectives”. *Envi. Politics.* 25: pp. 949-970.
- King A M, Burgess SC, Ijomah W, McMahon CA. 2006. “Reducing waste: repair, recondition, remanufacture or recycle?” *Sus. Dev.* 14, 4: pp.257-267.
- Levin.K, Cashore.B, Bernstein.S, Auld.G. 2012. “Overcoming the tragedy of super wicked problems: constraining our future selves to ameliorate global climate change” *policy sci.* 45,2: pp. 123-152.
- Maniates M. 2001. “Individualisation: plant a tree, buy a bike, save the world?” *Global Envi. Politics.*1: pp. 31-52.
- UN, general assembly. 2012. “The future we want”. Rio,61/295.
- UN, general assembly. 2015. “Transforming our world: the 2030 Agenda for Sustainable Development”, A/RES/70/1, pp. 2-10.
- Waddock S. 2013. “The wicked problems of global sustainability need wicked (good) leaders and wicked (good) collaborative solutions”. *The journal of management for global sustainability*,1: pp. 91-111.
- World commission on environment and development WCED. 1987. “Our common future-Brundtland report”, Oxford University Press.

# Current Trends in Global Economic Inequality

Elisabeth Makio, Second Year Geography

*Abstract* – Constant economic growth in the past decades has led to successive rise in disparities. From a geographer's perspective, economic inequality has several implications. Study show that countries, which have more equal income, tend to be happier. Such societies perceive themselves as just and fair (Oishi, Kesebir and Diener, 2011). Moreover, inequalities tend to, at some point, undermine political institutions and lead to instability, or even violence and wars (Sambanis, 2004). Understanding global economic inequality is thus crucial for studying global human geography as it plays a vital role in shaping regions, communities and conflicts. This essay focuses on economic inequality as a global phenomenon and argues that whilst the growth in global economic inequality is connected to global neoliberalism and technological advancements, its origins date back to the colonial era.

## Introduction and Background Information

Global economic inequality is a topic that has lately received attention in both academic literature and mass media outlets (Neckerman and Torche, 2007), despite the overall growth in world economy, global inequalities have been on the rise since the 1970s (WID, 2018). From a geographer's perspective, economic inequality has several implications. People are, on average, happier when there is less economic inequality and are more likely to perceive their society as fair and just (Oishi, Kesebir and Diener, 2011). Inequality can also undermine political institutions and lead to instability, or even violence (Sambanis, 2004). Understanding global economic inequality is thus crucial for studying global human geography as it plays a vital role in shaping regions, communities and conflicts. This essay focuses on economic inequality as a global phenomenon and argues that whilst the growth in global economic inequality is connected to global neoliberalism and technological advancements, its origins date back to the colonial era.

As shown in figure 1, inequalities have been rising since the 1980s. Exceptions to this trend include the Middle East, Sub-Saharan Africa and Brazil. These regions have maintained high levels of economic inequality for a longer period. Unlike Europe and North America, they did not experience the 'post-war egalitarian phase' of social welfare reforms and relatively low economic inequality

(WID, 2018). This poses a vital question: what are the causes behind this new, global rise in income inequality?

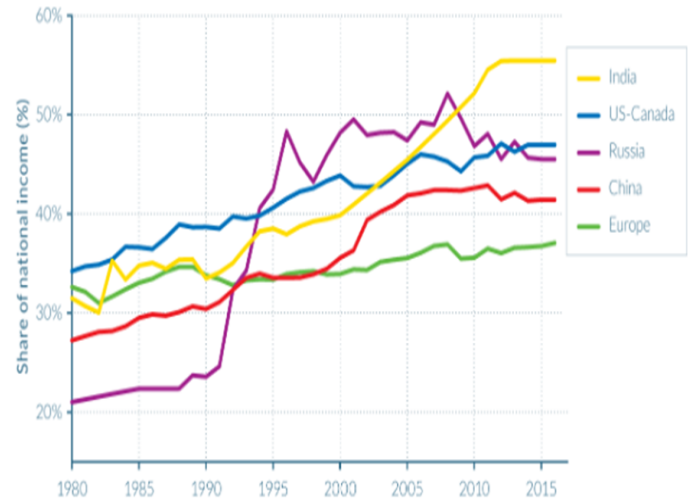


Figure 1: Top 10% income shares across the world, 1980-2016, rising inequality in most places but at different rates. Source: (WID, 2018).

## SBTC and Polarisation Thesis

Greenspan's Skill Biased Technological Change hypothesis (SBTC) suggests that the computerisation of workplaces led to higher demand for highly educated workers who could better harness the possibilities of new technologies. This in turn resulted in demand exceeding the supply of workers, and thus, higher wages for more highly skilled workers (Greenspan, 1998).

The SBTC has numerous criticisms, of which two are discussed here. Firstly, there is a misfit of timings; inequality was already rising before computers became widespread in workplaces. Secondly, there were regional differences in the growth of inequality during the computerisation of the 1990s. Both Americans and Europeans computerised their workplaces around the same time, yet inequality grew more rapidly in the US (Mishel and Bernstein, 2003).

A modified version of SBTC, suggests that technological advancement in workplaces increased the productivity of high-skilled workers and eliminated the need for 'routine cognitive workers' (Greenspan, 1998). Meanwhile, computerisation had little to no impact on manual

labourers and service industry workers, leaving their productivity unaltered (Neckerman and Torché, 2007).

### **World Systems Theory**

Immanuel Wallerstein's 'World Systems Theory' seeks to explain why global economic inequalities mimic former colonial power structures (Eades, 2012). Wallerstein's theory recognises that we currently live in a capitalist world economy, consisting of core, semi-peripheral and periphery countries. The core countries (former colonial powers, also including the US) extract resources and cheap labour from the peripheries (primarily less economically developed countries) for their own economic development. This, in turn, maintains the peripheral countries at the same, or even a degraded level of development. The semi-peripheries, such as Mexico and Brazil, act as 'buffer zones', deflecting the anger and revolutionary activities of the peripheries and providing the core countries' capitalists with investment opportunities (Chirot and Hall, 1982).

According to Wallerstein's framework, growing inequality is neither a recent phenomenon, nor a current trend. Instead it is seen as an inevitable part of capitalism. The exploitation of peripheral countries is seen as vital for the economic development of core countries. Globalisation, where all countries are connected via a single world economy, means that economic inequality must therefore be studied holistically (Eades, 2012).

The World Systems theory has been criticised as being Eurocentric, portraying European countries as history's 'winners' (Eades, 2012). Furthermore, some countries do not fit into such categories. For instance, the hindered development of eastern European economies, such as Poland, has less to do with colonisation and more to do with inefficiencies in agriculture and economic policies (Chirot and Hall, 1982). Wallerstein's World Systems Theory must therefore be approached with caution.

### **Globalization and Economic Inequality**

In his book, *Globalization: The Key Concepts* (2014), the renowned anthropologist Eriksen argues that despite globalisation having roots in ancient civilisations, there is something unique about the present, post-Cold War world. The increase in economic inequalities after the Cold War in Western countries appears not to have been coincidental, but instead linked to rise of neoliberalism.

Generally, global markets reward those with assets to participate in them. In this way, global trading schemes

help support Wallerstein's argument of maintaining the wealth of former colonial powers, through buying cheap raw materials from developing countries and selling Western products back to them (Eriksen, 2014). Financial markets are fast-paced and require economic flexibility, qualities which less economically developed countries often lack (Birdsall, 2004). The authorities of global finances (namely, the World Bank and IMF) are often led by Western countries. Thus, they are the ones who get to write the rules of global economy, rules which are designed to maintain the power balance in their favour (Birdsall, 2004). This, in turn, leads to inequality, as development is only happening in already more economically developed countries.

On the other hand, globalisation has enabled the rise of previously less developed economies, such as China and India (Eriksen, 2014). Despite some countries experiencing more national economic inequality as a result of globalisation, left-wing policies (such as income redistribution and progressive taxation) have helped to lessen and moderate these income inequalities. This would suggest that national governance is the key to minimising national economic inequality, and that globalisation could play a role in improving the lives of citizens in these countries (Ha, 2012). As less economically developed countries often lack the strong institutions vital for national economic equality, it becomes more difficult to create more egalitarian societies on a global scale (Birdsall, 2004).

### **Neoliberalism and Global Inequality**

Neoliberalism is defined by geographer David Harvey as a theory suggesting that 'human well-being can be best advanced by liberating individual entrepreneurial freedoms and skills ... by free markets and free trade.' (Harvey, 2005, 2). Neoliberalism took root around 1980, under the rule of Ronald Reagan and Margaret Thatcher (Eriksen, 2014). Despite its original aim of increasing prosperity, some critics have pointed out that instead of doing so, neoliberalism has exacerbated global inequalities (Harvey, 2005). Since neoliberalism, as an ideology, believes that all barriers to the market are inherently undesirable, global neoliberalism therefore seeks an economically unregulated world. This has led to capital '[roaming] the globe' for the lowest costs and the highest profits (Litonjua, 2008, 264).

This can be seen, for example, in the geography of Apple, one of the most economically valuable companies in the world (Forbes, 2018). Apple has hundreds of suppliers

either providing them with raw materials or working to assemble their phones across the globe, the distribution of which can be seen in figure 2. Despite this, however, the three biggest shareholders of Apple are US-based (Hunnicuttt & Stempel, 2018). This leads to global economic inequality, as the low-paying manual labour is situated in less economically developed countries, whilst the high-paying labour is supplied and investments are made in more economically developed countries. Apple is an example supporting the World System theory, as a core country-based company that exploits peripheral/semi-peripheral countries for its own profit.

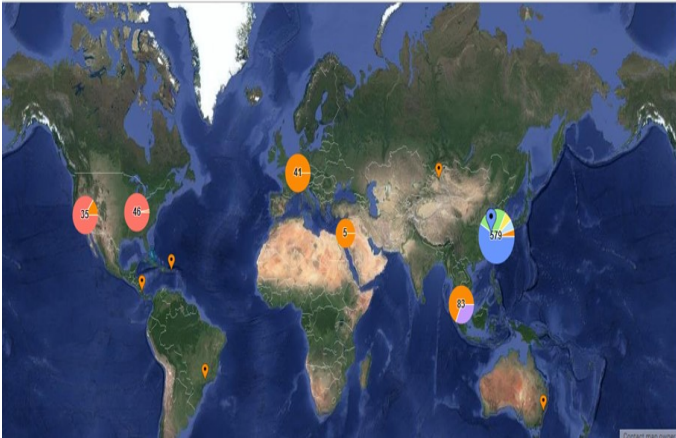


Figure 2: Map of supplies for Apple in 2013. Source: (Batchgeo, 2013).

Dispersal of this nature would have been unheard of without the help of economic deregulation from neoliberalism and improved global connectedness in the form of quicker transportation, faster communications and a shared mode of economics – neoliberal capitalism – that has resulted from globalisation (Eriksen, 2014).

## Conclusion

In conclusion, it can be argued that Wallerstein's World System Theory remains relevant in explaining global economic inequality, mainly because neoliberalism has been enforced by the global political leadership. The polarisation thesis is also still relevant and is likely to have more effects as automation of workplaces looks set to continue in the future (Mishel and Bernstein, 2003). From a geographer's perspective, this is extremely relevant, as it provides us with context for current economic inequalities and a reason to study regions and their place within the capitalist world system. Global inequality is no coincidence and it should be studied as a system with regional impacts, rather than as isolated cases.

Since more of the same polarisation can be expected globally, it would also be interesting to monitor countries

with low levels of automation in order to see if their inequalities begin to grow with increased technological advancement. A profound change in global politics is needed if the current upwards trajectory in economic inequality is to be stopped. Considering all of the issues which inequality brings, combined with other challenges linked to global neoliberalism (including a lack of democracy and climate change), geographers should be extremely concerned with the global impacts of these current trends.

## REFERENCES

- Barreda, D. (2013). Suppliers List 2013.
- Birdsall, N. (2004). Why Global Inequality Matters. *Brookings Trade Forum*, pp. 297-303.
- Chirot, D. and Hall, T. (1982). World-System Theory. *Annual Review of Sociology* 8, pp. 81-106.
- Eades, J. (2012). Anthropology, political economy and world-system theory. In J. Carrier, *Handbook of Economic Anthropology*, 26-41.
- Eriksen, T. (2014). *Globalization: The Key Concepts*. (2nd Edition). London: Bloomsbury Academic, pp. 1-19.
- Greenspan, A. (1998). *Income Inequality: Issues and Policy Options*. The Federal Reserve Board.
- Ha, E. (2012). Globalization, Government Ideology, and Income Inequality in Developing Countries. *The Journal of Politics*, 74(2), pp. 541-557.
- Harvey, D. (2005). *A Short History of Neoliberalism*. Oxford: Oxford University Press.
- Hunnicuttt, T. and Stempel, J. (2018). Warren Buffett is now Apple's third biggest shareholder – and he wants to own more. *Financial Post* [Accessed: 12.10.2018].
- Litonjua, M. (2008). THE SOCIO-POLITICAL CONSTRUCTION OF GLOBALIZATION. *International Review of Modern Sociology*, 34(2), pp. 253-278.
- Mishel, L., & Bernstein, J. (2003). Wage Inequality and the New Economy in the US: Does IT-Led Growth Generate Wage Inequality. *Canadian Public Policy / Analyse De Politiques* p. 29
- Neckerman, K., & Torche, F. (2007). Inequality: Causes and Consequences. *Annual Review of Sociology* 33, pp.335-357.
- OECD (2017). *Country Fact Sheet: Iceland*. Government at a glance. [Accessed: 13.10.2018].
- Oishi, S., Kesebir, S., & Diener, E. (2011). Income Inequality and Happiness. *Psychological Science*, 22(9), pp. 1095-1100.
- Sambanis, N. (2004). Poverty and the Organization of Political Violence. *Brookings Trade Forum*, pp. 165-211.
- Touryalai, H. and Stoller, K. (2018). GLOBAL 2000: THE WORLD'S LARGEST PUBLIC COMPANIES. *Forbes*. [Accessed: 12.10.2018].

# Interview with Professor Colin Ballantyne

Interviewed by Conner Morison, Fourth Year

Section editor of physical geography Conner Morison sits down with Professor Colin Ballantyne, professor emeritus whose lifelong work studying periglacial landforms and processes; glacial reconstruction and their palaeoclimatic implications; and the exposure age of high-level erratics has shaped the discipline of geography forever.

**Conner:** *When you started teaching geography, what was the main research interest of the department (as it was then)?*

**Professor Ballantyne:** The main ones in physical geography were geomorphology and palaeoecology, and in human geography probably demography was the main interest. So things don't appear to have changed very much from what we've got now, except that at one stage palaeoecology more or less got completely wiped out, but has since reappeared. These would have been the two main pillars of physical geography research at St Andrews. What you have to remember, though, is the total staff number was only eight, so there wasn't so much research being done, simply because there weren't as many people doing it.

**Conner:** *At the moment, geomorphology seems to have taken a back seat and there's more in the way of reconstructing past environments...*

**Professor Ballantyne:** The emphasis that comes in the degree programme very much depends on the research interests of the people who get employed and we've only ever had one or two geomorphologists (me and one other, when I've been lucky). It's taken a back seat, I think, simply because of the decision to focus research groups in palaeoecology and in glaciology.

**Conner:** *Much has changed in terms of the sub-disciplines – where do you think geography as an overarching discipline is heading, particularly as we're now integrated with sustainable development?*

**Professor Ballantyne:** In general, we see a much greater integration of physical and social geography particularly within the medium of sustainable development. They're no longer existing in separate camps; there's now considerable overlap in terms of their interests, and having sustainable development sitting in the middle has certainly aided that. So physical geographers are now considering matters which are of societal importance, and similarly the sustainable development people are involving themselves not only with the social side of sustainable development but also, of course, with the environmental side. So I think that we're seeing, in certain areas of geography, a convergence towards greater integration of human and physical geography under the umbrella of sustainable development. It has certainly been very useful in generating research funding from outside. Research councils are particularly interested in research which is investigating societal or environmental problems, rather than simply blue-sky research which is not necessarily of any societal or environmental importance.

**Conner:** *What was your inspiration as a student?*

**Professor Ballantyne:** When I was an undergraduate at Glasgow University, I had two great loves in geography: one was geomorphology (naturally enough), and that was probably stimulated by the fact I was really interested in landscapes and landform processes. But I was also hugely interested in historical geography, and the reason for that is, at that time at Glasgow University there were two very inspired teachers in historical geography, particularly that of Scotland. Their teaching stimulated numerous people to attend their Honours module courses. Why did I choose geomorphology to take further? At that time, a lot of historical geography involved archival work (reading old maps and documents etc.) trying to find what the landscape looked like a hundred years ago – and that wasn't really what interested me for a research topic.

**Conner:** *With the benefit of hindsight, what advice would you give your younger self for using a geography degree in life after graduation?*

**Professor Ballantyne:** If I had to revisit myself at the time I graduated from Glasgow University (which is a very long time ago), I probably wouldn't have done anything terribly different. I did a Masters degree in Canada, which hugely expanded my horizons. I carried out research in the Canadian Arctic. The only change I might have made is, instead of coming back to Edinburgh to do a PhD, I would have taken up an offer to go to the Institute of Arctic & Alpine Research in Boulder, Colorado. I decided, probably wrongly, not to do that, but to come back to Scotland. That would have made everything change in the pattern of my subsequent life. Otherwise, I think I was incredibly fortunate to be able to get into the positions I got into in the time that I did.



**Conner:** *What has been the highlight of your academic career?*

**Professor Ballantyne:** As long as we don't speak about the low-lights!

**Conner:** *You mentioned in class that there have been many serendipitous moments?*

**Professor Ballantyne:** There was one particular lucky break that I had in my career, and that was in 1993. I met with a gentleman called John Stone who was then at the Australian National University, and is now at the University of Washington in Seattle. John was just developing the technique of cosmogenic nuclide dating and I was able to get in right at the very beginning of the development of this technique. It gave me a five year start over the competition. Almost all of the early cosmogenic work done in Scotland, and indeed in Ireland and northern England was done by John and I. This was entirely good luck. If I hadn't met up with John and interested him with the sort of work I was doing, then that would never have happened. But to identify another, it would have been taking a fieldtrip to Norway in 1988, and suddenly appreciating the sheer scope of paraglacial landscape modification from the site that we chose to investigate. Along with Doug Benn I was able to carry out what has now become a classic study of slope adjustment to deglaciation that triggered an interest in paraglacial landscape response that's yielded a great deal of useful findings – it's wholly expanded the field. Those two particular turning points were immensely influential. It was a bit like investing in companies whose shares go massively up in price; I managed to invest in cosmogenic radionuclides and paraglacial landscape change at a very early stage in their development, and was able to take both forward quite considerably by myself.

**Conner:** *Fieldwork is a big part of both physical and human geography. Where is your favourite location to undertake fieldwork?*

**Professor Ballantyne:** Ahh! Well, the problem with answering that question is that there are far too many places. If I had to identify my favourite place for doing fieldwork in Scotland, it would definitely be either the Isle of Skye or An Teallach in the NW Highlands, both of which I've worked on extensively. My favourite places abroad would be the Lyngen peninsula of northern Norway and the Jostedalbreen area of southern Norway. If I had my time again, the place I'd go to do fieldwork would be definitely the Southern Alps of New Zealand, which has huge potential for answering all kinds of interesting geomorphological questions.

Thank-you to Prof. Colin Ballantyne for taking the time to be interviewed and contributing to our inaugural issue of *The Irvine Atlas!*

# Interview with Professor Elspeth Graham

Interviewed by Gabrielle Wolf, Fourth Year

Editor-in-chief Gabrielle Wolf sits down with Professor Emerita Elspeth Graham, the first female professor of geography in St Andrews' 600+ year history.

**Gabrielle:** *Thank you for chatting with me! Could you please tell me a bit about yourself?*

**Professor Graham:** I'm professor Elspeth Graham of the School of Geography and Sustainable Development. My specialism within geography is population and health geography. I'm particularly interested in fertility change in Europe. I have another large project in Southeast Asia, an area that I've done a lot of work in, which is on parental migration and the health of children who are left behind in four countries in Southeast Asia – namely Indonesia, Philippines, Thailand, and Vietnam. I retired officially at the end of December.

**Gabrielle:** *Is this work that you're currently undertaking?*

**Professor Graham:** Yes, we did a big survey in 2008 which collected quantitative data followed up by a sub-sample survey of qualitative in-depth interviews in 2009. Then we followed up with the same families again in 2016 and did a follow-up survey in 2017 which was qualitative. Mixed methods, big project tracing people over time!

**Gabrielle:** *Are you continuing that work after you depart this office?*

**Professor Graham:** Yes, hopefully! We followed up the samples in the Philippines and Indonesia and will go this year 2019 to Thailand again. Slightly different because they have two samples, those whose parents travel inside Thailand – internal migrants – and those whose parents migrated abroad. I'll look at both groups in Thailand. Then looking for finance for follow-up in 2020, another in-depth sub-sample. It's called the Child Health and Migrant Parents in Southeast Asia, the CHAMPSEA project.

**Gabrielle:** *What do you think you're going to miss most about officially being at St Andrews?*

**Professor Graham:** Probably contact with students really. Although I will still have contact with post-grads and post-doc researchers, I'll miss the undergraduate students funnily enough. (laughs)

**Gabrielle:** *Really? Because I see us [undergraduates] as a bit of a pain sometimes.*

**Professor Graham:** No, no! I think, particularly honour modules, because that's your specialism. First and second year, not so much probably. Although I used to teach History of Geographic Thought which was a nice challenge because people didn't – it wasn't their favourite course, shall we say. Which was always challenging for the staff member. It was also second year and at 9 o'clock in the morning so that wasn't very popular either!

**Gabrielle:** *You did your undergraduate here didn't you? Joint honours with Economics?*

**Professor Graham:** I did, yes. I did a Joint Honours degree with geography and economics. But we had a very different system then to now, which may be quite interesting for undergraduates now. We had what we called the "Big Bang" finals where everything depended on your final exams, but that meant that your last semester in fourth year was all revision and then you sat all of these papers. I did a dissertation in geography and a dissertation in economics because I was doing a joint degree. Because of the structure of the course I was able to do, which personally benefitted me, 3 years of philosophy. It was compulsory to take a philosophy of some kind and so I did moral philosophy – not that I knew what that was – but I found out soon enough! And then I did logic and metaphysics for the next 2 years. And that really started, I suppose, my interest in the philosophy of social science and therefore the philosophy of geography. So that was good, but we didn't sit nearly as many exams as you sit. We had a system whereby, if you got a ranked certificate for your coursework, you didn't have to sit an exam. I think there were some exceptions. But I didn't sit that many exams until the finals, with the result that my favourite year was third year because there were no exams at the end of the term.

**Gabrielle:** *Are you still interested in moral philosophy?*

**Professor Graham:** Very much so, yes. And logic and metaphysics I have to say, in the sense that – Well, I have a chapter that I wrote for a book called *Methods in Human Geography* which is about the philosophy of geography.

**Gabrielle:** *Yeah, I'm familiar! (laughs)*

**Professor Graham:** (laughs) But I have a belief that you can explain these things using fairly straightforward language! Indeed, I've had emails from students, lots of students from other universities, saying, "We actually understood the chapter!" Which is nice, it's very nice.

**Gabrielle:** *Is that out of your personal writing style or the idea that academia should be made more accessible? Or both?*

**Professor Graham:** I think it was my training in philosophy here, actually. Because I think there were quite a number of the philosophers that believed in what's called "ordinary language philosophy". The idea that you can actually explain complex ideas in ordinary, or straightforward, language. It is probably my writing style too, but yes part of my training.

**Gabrielle:** *How has geography as a discipline changed since you were an undergraduate?*

**Professor Graham:** A lot. I came in, I think, probably just at the point where quantitative methods were coming to the floor in geography. There was a lot of measurement and a very abstract look at geography which was useful in the sense that I reacted against it and criticised it as an undergraduate. So it kind of gave me a mission and a mission as a postgraduate, as well. But since then it's changed a huge amount. There's a much more cultural turn that happened at the end of last century. In a philosophical sense – relativism. The idea that where you are, who you're with actually influences what you write and what you research has come very much to the floor. And there still is right now somewhat of a divide. Geography has become much more specialised in general. We started this interview by me saying, "My specialism in geography is population and health". And other people might say, "My specialism is cultural geography" or "historical geography" or whatever. But also, there's a divide in terms of methods. I like to do mixed methods because I like to understand more than one method. I suppose I like bridging divides. But I see geography as getting more specialised. Not just geography, it's happening in all sorts of sciences, for example. I imagine, although I don't know, that this is happening in many of the arts subjects as well. So you get people now saying, "Oh I can't teach that because I don't know any physical geography." When I started teaching, I had to teach across a very broad range which would probably alarm current staff members if they were required to do that. But the number of staff members was much smaller.

**Gabrielle:** *And you made some great leaps and bounds on behalf of women in your professorship. Can you talk with me a little bit about that?*

**Professor Graham:** (laughs) Well, I started lecturing here in 1980 having had a year at the University of Minnesota, which was interesting. Very interesting to me.

**Gabrielle:** *Football games! And very cold.*

**Professor Graham:** Extraordinarily cold! (laughs) And that was a shock to me, even coming from Scotland, it was a shock. But also, state university with forty-odd thousand students. I come from St Andrews undergraduate and Durham postgraduate, both small universities, so it was a real shock for me to be on a huge campus. Big classes and much more variety in terms of people's backgrounds and achievements and potential than there was in undergraduates at either St Andrews or Durham, who tend to have very good qualifications. The real challenge there was teaching the post-grads, who were fantastic. By the time they came through to post-graduate work, to PhDs, they were very hard working and very determined! So that was really interesting, teaching the post-grads. But anyway, coming back here I was the only woman in the department but there had been a previous – in fact, Kay McIver who is the McIver prize in geography? She was in the department when I was an undergraduate and taught me, in fact. But she had become Master of the University at that point I think so wasn't teaching in the department anymore. And I replaced her. So one woman for one woman. But everybody else was male. And I guess that, until relatively recently, was the case. So when I did get promoted to professorship, that was the first female professor of geography in the 600-year history of St Andrews, so yes.

**Gabrielle:** *Well, thank you! I'm happy that some more have joined your ranks.*

**Professor Graham:** Indeed. So am I. It's nice to see more females being appointed. But when I started in September 1980, the university was very male dominated. Now it's become much more split between males and females at the lower levels, but it's

still relatively rare at the senior levels. I mean, as you know, we have another female professor in the department. But the number of female professors in the university as a whole is quite small, still.

**Gabrielle:** *Do you think maybe that's time? Waiting for percolation?*

**Professor Graham:** Yes, yeah, I think so. Although I think St Andrews has been slower than some other institutions in actually promoting women. I think it's made a difference that we have a female principal.

**Gabrielle:** *So being a geographer means, for better or for worse, rain or shine, we have to do fieldwork at some point. Perhaps this is the only thing that sets us apart from things like anthropology, or history, or economics, is that we do fieldwork\*. Do you have any fieldwork memories from your time that stand out?*

**Professor Graham:** Oh dear! (laughs) As an undergraduate for second year we had a residential field course in Yorkshire, and I think we stayed in Leeds. I don't remember much about the content of the fieldwork, I do remember having to walk over hill and dale though and doing a survey of business in York. The group I was with decided... (laughs) now this is a hint, don't copy this. Somebody had the bright idea that if we just went into a pub and got a telephone book, we could actually jot down all the businesses! So we got a map and sat down with our drinks rather than walking down the street. (laughs)

**Gabrielle:** *Oh goodness!*

**Professor Graham:** The other thing was that in third year, for junior honours, we went on a residential field course to France. And that was very interesting from lots of points of view. But my major memory there was I was put in charge of a group of students to report back. And it was assumed that we would do a survey in French. At the time, in order to qualify for this university, you had to have a foreign language of some kind and it so happened that French was the most common one. But even so, people weren't that fluent in French. So we stumbled through this survey in French and indeed I also had German and that ended up being useful. We were in an area of France, near Strasbourg, where some people spoke German. I remember that very clearly because it was quite the challenge to conduct surveys in a foreign language! We also went to talks by planners in French and it was just assumed that that's what you did. I think many of the students probably didn't understand very much of it.

**Gabrielle:** *So we've also done an interview with Colin Ballantyne, whom you share an office with. How has your experience been, sharing an office with Professor Ballantyne?*

**Professor Graham:** Although you see his things are here (gestures to rock), we haven't shared it at the same time which might be a bit challenging. We come in at different times, by arrangement. But Colin and I have a long history because he came here just before I did. So when we were young lecturers, basically we were given the first year – he did the physical geography and I did the human geography. But I also did things like air photographic interpretation. Which I have no particular expertise in and never had, but I just had to teach it because that was what was done. But other than that, he did most of the physical geography and I did most of human geography in first year. And yes, we've had parallel careers in that way, so it's been quite interesting. Don't agree on much, no. (laughs)

**Gabrielle:** *(laughs) Are you talking in a disciplinary sense?*

**Professor Graham:** Yes, yes. In a disciplinary sense. He has a very scientific view of what geography is and should be. I have perhaps a more human view of what geography is and should be. Perhaps as a result of that, all sorts of policies that come up for discussion, we found ourselves on both sides of the fence (laughs). But when we did agree we were a powerful team in that way because we tended to prevail if we did agree. But it wasn't that often.

**Gabrielle:** *You got to be in St Andrews for your undergraduate degree. Do you have any piece of advice for young geographers who might be looking at the next three years here at St Andrews with wide eyes or fourth years who are about to graduate and go into the work force or continue our education – do you have any words of advice for us?*

**Professor Graham:** The one piece of advice I would give, and not just for geographers, but geographers in particular perhaps because there are so many choices in geography of what you could study, I think study what really interests you. Because you never know what's going to be useful in the future. I think that some people take far too much of a practical view and think, "Well if I did that, I might get a job with that" or whatever. But actually, to do what interests you means you're going to do better. And getting a better degree is always going to be an advantage, I think. When I chose to do logic and metaphysics, it was with no

thought of what I might do in the future. I had no idea I was going to end up as an academic. In fact, there were only two things I wanted to do: one was to teach deaf children, funnily enough; and the other was to do a PhD. But again, with no particular thought because looking around, I couldn't see that many women in academia. So I just thought, probably I'll become a teacher eventually, so logic and metaphysics would be no use to me. But I did it and I enjoyed it and it has been of use to me, so you never know.

**Gabrielle:** *That's a great piece of advice, thank you! Thank you very much. I think this is going to be a nice interview for the journal.*

\* Following this interview, Professor Graham pointed out that geography is not the only discipline that partakes in fieldwork, and that field study does not necessarily set us apart from subjects such as anthropology. What followed was an exciting discussion on the place of fieldwork in geography's pedagogy and traditions.

# Report COP24: Changing together

Iga Józefiak, Fourth Year

At the beginning of December 2018, delegates from 196 countries visited the International Congress Centre in Katowice for the COP24 Climate Talks to the UNFCCC. The premise of this conference was to develop a roadmap for the implementation of the Paris Agreement, which was successfully created and noted in the Katowice Climate Package. The adopted package, dubbed the 'Katowice Rulebook', further aims to encourage ambition in the field of climate action and benefit people from various backgrounds, especially the vulnerable. The Rulebook obliges all countries to act together to stop climate change. Although the negotiations were prolonged, the conference was altogether successful in that the document was signed. However, the key will be the actions that will or will not be taken by individual governments in the next few years. Although the impact of COP24 can only be evaluated in hindsight, the next few years will prove decisive in preventing climate change. Notably, COP24 was sponsored by Polish coal and energy companies such as Jastrzębska Spółka Węglowa (JSW), Tauron, and Polish Energy Group. This irony did not go unnoticed by delegates. Daniel Ozon, CEO of JSW, stressed the desire to create the company's image as a pro-ecological leader in the mining industry. However, it is worth emphasizing, that currently proposed solutions to the climatic problem strongly suggest a complete move out from fossil fuels. Therefore, 'pro-ecological coal mining' is really an oxymoron.



Figure 1: COP24 International Congress Centre, Katowice  
Source: (Józefiak, 2018).



## Organisation of COP24

Previous successful summits such as Poznań 2008 and Warsaw 2013 encouraged the UN to host COP24 in Poland. The event gathered nearly 30,000 delegates from around the world, including heads of government, environment ministers and scientists, non-governmental organizations and industry representatives. For the organization of COP24 Poland allocated PLN 250 million.

At COP24, parallel meetings and discussions were open to all participants every day. At the same time, behind the closed doors, negotiators discussed specific goals and constructed the Katowice Package. The less formal Action Hub held open meetings with selected guests, for example with former California governor Arnold Schwarzenegger and Greta Thunberg, the 15-year-old Swedish student who protested climate change in front of the parliament. Each of the pavilions at COP24 held internal discussions, meetings, presentations or events. The most interesting and the most beautifully decorated ones were the stands of India (Figure 2), that of Indonesia, and the stand proposed by Katowice (Figure 3), showing the exhibition and products made from coal, e.g. soap and jewellery. In the opinion of the majority of conference participants, the energy sector should completely divest from non-renewable resources, of which combustion poses a great threat to the environment, instead of promoting them during the event. The organization of climate conference in Silesia, the most polluted region of Poland, has been, by most, perceived as an expression of irony and, by others as a symbolic of supporting the worst performing areas.

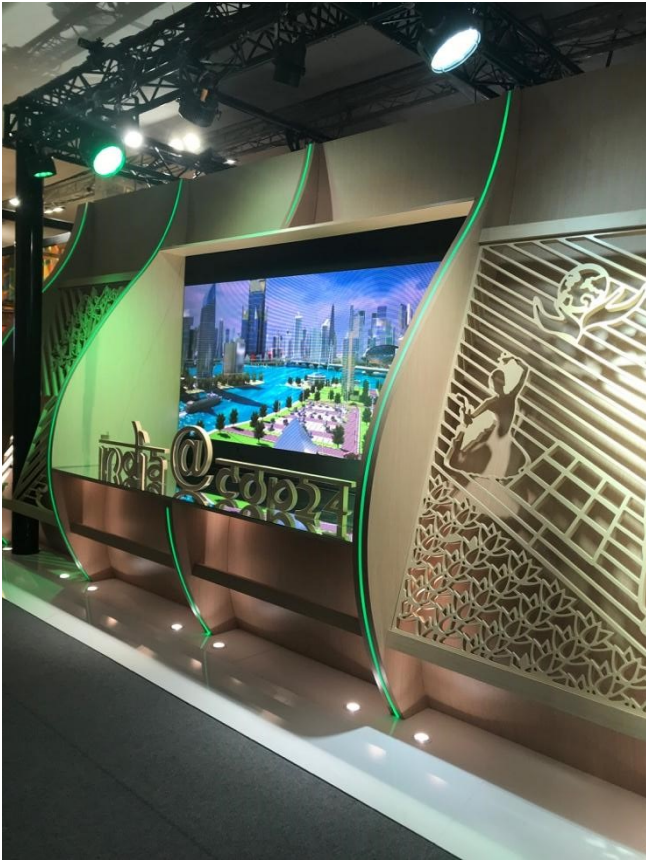


Figure 2: India stall, sector E of the International Congress Centre  
Source: (Józefiak, 2018).



Figure 3: Katowice stall, sector E of the International Congress Centre. Source: (Józefiak, 2018).

### Assumptions and goals

The UNFCCC was ratified at the 1992 Earth Summit in Rio. Its overarching goal is to prevent anthropogenic interference in earth's climate. Since then, annual conferences have been held, during which the delegates meet and discuss how to mitigate climate change. COP24 focused specifically on technological, humanitarian, and natural issues.

### Technology

During the first press conference, Andrzej Duda, Poland's President, announced the nation's goal of achieving 'climate neutrality.' This concept assumes offsetting greenhouse gas emissions through carbon sequestration to achieve carbon neutrality. President Duda announced that Poland's main goal will not be decarbonisation but planting forests and developing more efficient coal technology. He also emphasized that Poland does not intend to move away from coal energy due to economic (energy sovereignty) and social (mining jobs) benefits. Presently, the whole world is striving to divest from fossil fuels and base its economies instead on renewable sources. Poland, on the other hand, remains rigid and continues to extract coal in order to maintain jobs. Additionally, achieving climate neutrality does not necessarily solve other environmental problems such as smog or acid rain, the first of which particularly affects Poland. 33 out of the 50 most smog-ridden cities in Europe are located in Poland. The risks to human health posed by these environmental hazards are increasingly visible. The link between human health and renewable or fossil-fuel based energy systems is becoming more and more apparent. So far, 57 countries have pledged to become entirely reliant on renewable energy by 2050.

The development of modern technologies is considered to be indispensable to achieve the goals related to climate change. The hitherto impressive achievements include not only carbon sequestration methods or the development of renewable energy generation, but also the expansion of electromobility. Ambassador Janusz Reiter, the Member of the Solaris Supervisory Board, during one of the panels expressed his enthusiasm regarding Poland's potential in this sector, emphasizing the importance of the Polish product on the international market. He also pointed out that even in countries where more than 70% of electricity is produced from coal, the introduction of electric or hybrid vehicles is still beneficial because it promotes change towards cleaner technologies, makes the public more aware and educated, and thus is an incentive for changes in energy sector.

## **Human**

As people become more conscious and educated about the effects climate change has on their individual lives, they put more and more pressure on decision-making bodies to make the right legislative choices. Governments are beginning to treat climate change more seriously, but not all governments prioritise conservation and CO<sub>2</sub> reduction for the time being. President Duda emphasized that climate policy must be sustainable - from a governmental perspective, 'not harmful to society.' Miners losing their jobs due to coal plants shutting down, for instance, would harm both Poland's society and economy. A smooth transition in the energy sector is necessary if Poland is to move away from coal. WWF Poland also emphasized the necessity for a 'just transformation' consisting of slow, successive changes that would not shock society unnecessarily.

Education in the field of sustainable development is still at a very moderate level in many countries. Similarly, for the majority of the society in Poland, what matters the most is: safety, stable work, satisfying salary. When climate change starts to overwhelm the average Pole in everyday activity, whether it be due to health complications, changes in weather conditions, or an energy war, it will be too late to act at all.

## **International cooperation**

COP24 conference was extended by one day due to the opposition of Turkey and Brazil, which demanded some corrections in the Katowice Package. Turkey wanted to be moved from the developed countries group to the developing one, in order to be subject to less strict regulations. Brazil, in turn, did not want to approve the unfavourable provision regarding the trade of international greenhouse gas emissions after 2020. Finally, the paragraph concerning this case was completely deleted and its negotiations postponed to another date. As seen above, international cooperation is theoretically the most important, but in reality, many countries are demanding the most favourable regulations for themselves, caring only for their own interests, treating the problem of climate change as a side issue. Countries feel social pressure, but most of them are still not ready for radical changes and rapid actions. They still hope that the real effort will be made by others, and they will be able to benefit from the free-rider effect (a situation in which the entity uses goods (e.g. air quality) without participating in the costs of producing them (e.g. not reducing their own emissions)).

Almost every panel at COP24 emphasized the importance of international cooperation. Ambassador Reiter drew attention to the importance of European Union countries cooperation, making use of the strengths of each other to promote electric vehicles and create a sustainable European transport. Laurence Tubiana, chairwoman of the European Climate Foundation, on the last official day of the conference, stressed that building adequate confidence among states is the first step towards creating a fair, responsible and well-functioning international cooperation for climate change. Countries are not equal in the face of global warming – some have more funds, others have better geographical location and therefore are less affected by weather anomalies. But climate change will ultimately affect every inhabitant of the Earth (whether through deteriorating air quality, extinction of beautiful species, or economic crisis). Laurence Tubiana also raised the interesting question of the lack of participation of many world leaders (such as Donald Trump, Emmanuel Macron, or Angela Merkel) at COP24. In her opinion, the agenda of the summit in Katowice did not require the presence of leaders, but rather motivated, willing to implement real actions representatives of states. For this reason, the absence of the most important Presidents should not be perceived as a disrespectful signal, especially since the conference was eventually successful.

## **Conclusions**

The COP24 conference, despite the absence of world leaders, the controversial promotion of Polish coal energy and stubborn opposition from Turkey and Brazil, was successful as it led to the creation of Katowice Package.



# The Cost of Fast Fashion Factories: A Case Study of Sustainability Efforts in the Delhi Area

Sophie Isabelle Vonholm, Fourth Year Geography and Management

The following feature was written by Sophie Isabelle Vonholm, who together with Iga Józefiak travelled to India on a full scholarship in January 2019. Special thanks to the donor Anish Tandon, Professor William E. N. Austin and Erlend Draget, Second Secretary at the Royal Norwegian Embassy in New Delhi, who met with Sophie to discuss Indo-Norwegian activities in energy, climate change and environment.



Figure 1: A garment dyeing mill near Badarpur using traditional methods of tie-dyeing. Source: (Vonholm, 2019).

## Introduction

Economic development has created better living conditions allowing for massive population growth by extending life expectancy and lowering mortality rates. As a result of an increasing population and consumption per capita, there has been massive pressure exerted on natural resources. Concerns of the link between a growing economy and increase in pollution have been around for a long time. However, pollution has become so severe that it is now itself affecting economic growth. It is the largest environmental cause of disease and premature death; harming health, degrading human capital and severely damaging economies. The World Bank estimates that ambient air pollution in 2016 cost the global economy 5.7 trillion dollars, 4.4% of global GDP. Pollution is undoubtedly a global problem. However, to gain insight into this issue on a national scale, India is an ideal place to start as nine of the world's ten most polluted cities are found here. During our time in Delhi, the National Air Quality Index hovered around 300, categorised as very poor quality with 'respiratory illness on prolonged exposure'. In the words of former director of the United Nations Environment Programme Erik Solheim 'clean air is becoming a luxury'. The problem has increased as industrial activity increases and the question is how can this be changed?

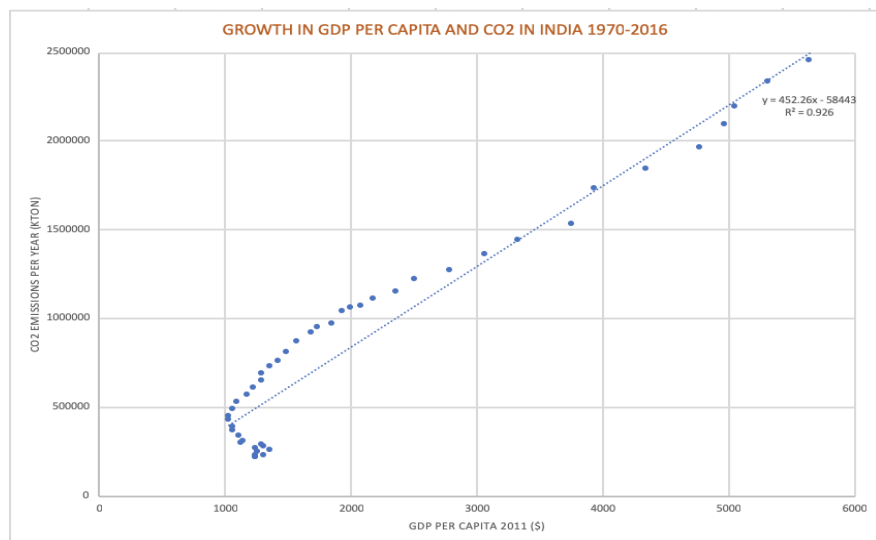


Figure 2: Using data from Maddison, 2018 and European Commission, 2016, this graph shows the correlation between gross domestic product per capita\* and the associated CO2 emissions in India 1970-2016. The R-squared value of 93% indicates a good fit of the regression model. Therefore, one can confidently assume that the mutual growth rate is a positive linear development. Source: (Vonholm, 2019).

In addition to poor air quality, the availability of fresh water is also greatly decreasing in India. The country currently sees over half of its rivers severely polluted mainly as a result of industrial activities. Fast fashion and mass production use vast amounts of resources. A pair of jeans traditionally takes 10,000 litres of water to produce and is the fourth largest water consuming product in the world after meat and dairy products. Therefore, minimising water usage in national industries would be immensely beneficial to both costs and environment. As a result of the severe pollution, all factories have been moved out of the Delhi centre. Furthermore, the Indian government has issued policies concerning the cleanliness of water that is drained from factories. However, there is not enough capacity within government to have this closely regulated. The same goes for legislation involving voluntary self-reporting of resource consumption at factories. Despite recent regulatory efforts, in reality most manufacturing processes remain unchanged.



Figure 3: A textile dyeing mill near Faridabad using high amounts of polluting chemicals and fresh water. Source: (Vonholm, 2019).

Yet there are some hints that the idea of a manufacturing transition is not completely lost. Our trip to India was sponsored by Anish India Exports, also known in the US as Instant Karma LLC. Over the past decade, this textile company, based in Gurgaon, has introduced efforts to reduce its impact on the climate. The two main areas of focus for Anish when it comes to sustainability are chemicals used in dyeing and water consumption. Recently, Anish started cooperating with a large natural dyeing factory in Goa and we visited their natural dye sampling unit in Chhatarpur. Instead of using toxic chemicals as in mass production, the founder of Bageeya Eco Clothing demonstrated how she uses plants to colour garments, made from organic cotton sourced from the south of India.



Figure 4: Dried pomegranate skin is used to make a light brown and marigold flowers to make mellow yellows. Source: (Vonholm, 2019).

Figure 5: Garments made by Bageeya Eco Clothing, Bageeya meaning garden, using the vegetable dyes pictured above. Source: (Vonholm, 2019).

In contrast to other fast fashion factories we visited, Anish's factory clearly had far less chemical waste and water use. He has invested in machines manufactured in Spain, namely E-flow and G2 machines which use electricity to add a faded and washed look to the garments. The traditional method would be using human labour and a lot of water to achieve the same effect. Furthermore, Anish Exports uses laser technology from Jeanologia to add patterns to denim fabrics. Naturally, given their technological innovations, these machines are very expensive. When visiting a textile dyeing factory in Faridabad, the owner was intrigued by the machines we mentioned and the subsequent lowered water use. However, when he learned the amount of substantial capital investment they required and the long-term profit window, he was dismayed.



Figure 6: The first image is a factory manager showing us a finished piece on Zara's web page, with his dyed garment in the background ready to be sewn. The journey to the ready fabric is high in resource consumption. Coloured dyes are added to screens or rolls. Source: (Vonholm, 2019).

The cheapest and naturally most common modes of production remain the traditional techniques using large amounts of natural resources and chemicals as well as human labour. The benefits of natural dyes and less chemical processing is obvious from the first step in to the factory. However, in addition to the elevated cost, a few other concerns arose. We noticed that the methods using electricity required much less human labour. At first, this may also seem like a benefit as it is cost cutting and the labour is physically strenuous for the worker. Yet a shift toward automated factories could increase the unemployment rate in the second most populous country in the world. A further problem is that despite development of off-shore wind power and other renewable energy sources in India, the machines are mainly powered by coal generated electricity. Governing these large-scale changes in employability and energy supply can to some degree be attributed to the list of government responsibilities. However, Shalu, head of design for Anish Exports, explains that the demand for sustainable garments must begin with the consumer. When a consumer is willing to pay more for a garment made with organic cotton, vegetable dyes and less water, a clothing company can charge more for the product and pay Anish Exports a higher price for their more expensive methods of production. The change has to come from outside the factories and mills.



Figure 7: The first image shows a dyeing machine using rolls, it dyes about 2,000 meters of textile per hour. After that the fabric has to go through several finishing processes to bind the dye and soften the textile. The last image shows a finished fabric, 80,000 meters of yellow prints for Mango. Source: (Vonholm, 2019).

## Conclusion

The problem of pollution is rising, and India is currently experiencing the damage to health capital most severely while the whole planet slowly faces the cost to natural capital. The inequity of its effects is showing and the insubstantial investments are apparent. Due to their climate, location and geography, many developing countries are going to bear the brunt of the impacts of

global warming. A change is needed, and such a change would be more sustainable if it came from economic development, that is an increase in productive capabilities, rather than simple growth. The increase in our capacity to produce is in effect our technological developments, as these are both the causes and possible solutions to environmental and health problems. Industrialisation of developed and developing countries is essentially the main cause of pollution. However, technological advancements can turn materials into new resources, widen the uses of a resource, generate more energy than before with the same material and enhance the positive feedback of renewable resources. In other words, a shift in financing can greatly abate the problems related to pollution. The right investment strategies can contribute to pushing developments in the right direction. The decreasing coal sector in parts of the US is, to some extent, attributed to solar and wind power being cheaper and more environmentally friendly options. In the same way, higher consumer demand for sustainably sourced garments could create a larger market share and increased sustainable production. Tackling pollution is thus threefold in its effect: it can benefit long-term climate goals and short-term health goals without necessarily having a negative impact on the economy. Handling consumer demand for production methods is one thing. Yet changing consumer need for speed is another issue entirely.

*\* Gross domestic product data says something about a country's economic output but not about advancement. The gross domestic product data used in the analysis in this report can therefore be inadequate in this respect.*

*Thank you for reading.*





**Thank you to all who make this  
journal possible.**