



GEOGRAPHY MATTERS

Post 16 and HE Phase Committee

Spring 2014

This edition of our newsletter, *Geography Matters*, provides ideas, thoughts and updates which will be useful for teachers and students of A-level. Professor Nick Clifford follows up his conference lecture, urging geographers to cross discipline boundaries to address current major global challenges. Dan Cowling offers case studies of health inequalities in the US and France, and Emma Rawlings-Smith updates our knowledge of energy innovation in Iceland. The benefits of Eco Schools are outlined by Kieran Ellement and geographers from Bancroft's School share candid views of their A-level course. Finally, Helen Hore uses the winter of 2014 in the US as a tool for teaching about extreme weather. Very many thanks to all our contributors for sharing their views and expertise.

Geography Matters can also be access on the GA website

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Join our sessions at Conference!

Lecture 4: Tuesday 15 April 11.45 – 12.35

Crossing Boundaries and divides: human-physical and school–university. Professor Nick Clifford. King's College London

Workshop 36: Wednesday 16 April 09.00 – 09.50

Mind the Gap: supporting transitions in information literacy between school and university

Dr Richard Waller, University of Keele

Chair's Notes

Iain Palôt

We all know now that the revision to A level Geography, which had seemed “done and dusted” last November, has been referred to the A-level Content Advisory Board (ALCAB). This committee, representatives of Russell group university Geography departments, will deliberate on what they believe should constitute the content of A level geography courses for the 21st century. Some of us are a little concerned that this group includes at least one person who had to ask, “*What exactly is an A2?*”. I have learned that whatever I write about specification reform goes out of date so fast that there seems no point in saying anything further. It is to be hoped that common sense prevails and that self-appointed vested interests produce a sensible working document which will attract the next generation of geographers. The timetable is tight, with an expectation that ALCAB will report in August and Awarding Organisations have new, approved specifications in centres by September 2015. To that end there is a “**teacher forum**” here at conference where you can have your say and to hear from a member of ALCAB as to what progress has been made. Details on the Post 16-HE conference stand.

The Post 16 committee has had its usual busy year supporting the branches, being involved in a range of examining tasks for a range of AOs (Awarding Organisations) as well as contributing to consultations on thereforms at A level and GCSE. We are proposing a Post 16 conference in November in London and Sheffield and would welcome your views on which topics to explore. Do you need specific materials or teaching techniques, or are you just in need of an update from a specialist? We have recently covered World Cities, Hazards and Water but wish to find topics that cross all the current specs. The intention would be to invite specialists, perhaps from local universities, to update on a topic, to offer some teaching ideas and materials, or demonstrate the application of some software.

We would also be interested to hear what format of CPD you would prefer. There are two possible options to date:

- A day course with perhaps three or four presentations covering the topics;
- A late afternoon/early evening session again with three or four sessions.

There are forms on the P16 stand to share your views so do let us know. This is your committee working for you, so tell us what you would like!

The conference this year is really exciting and we are delighted that we have two excellent geographers from higher education to support our sponsored sessions. Professor Nick Clifford from King's College London will be speaking about crossing the boundary from A level to university, with reference to the boundaries between physical and human geography. Dr Richard Waller from Keele University will be discussing Information Literacy, another issue at A level and crucial to the successful transition into HE. Richard will share some ideas and strategies about how to encourage students to read, what should they read, and how they should become more critical of literature. You are warmly invited to come along and join these sessions.

As always I must thank the members of the P16-HE committee for their support, advice and time; everything they do contributes to the work of the committee and the GA. Thank you all! Some of our activities are reflected in this issue of Geography Matters which contains some excellent articles including that by Professor Clifford in support of his lecture.

Finally do visit the P16 stand and come to our reception on Tuesday 13.15 – 13.45. I look forward to meeting you at conference.

Geography: crossing boundaries is no problem for the *incredible* subject

Nick Clifford

Professor of Physical Geography and Head of Department
King's College London

At a time when the GA has thrown down the challenge of reconsidering 'Crossing Boundaries', it is tempting to re-visit the numerous and recurrent debates regarding the coherence of Geography, its status, fragmentation and divisions, and its uncertain future. Certainly, the subject has a historical tendency towards such soul-searching, and 'Crossing Boundaries' could easily be deployed to frame divisions and antitheses between the 'human' and the 'physical', the place-based and the systematic, or the quantitative and the qualitative. As ever, there remains some problematic boundary-crossing for us as professional geographers to achieve in all of these respects. Aspects of the current lively debate regarding the boundaries between GCSE and A level in the proposed revisions to the National Curriculum, and the blend of facts, concepts, rigour, and skills which might accompany the school-university transition are certainly topical and appropriate to the boundary-crossing theme.

The new National Curriculum proposals have, for many, placed a welcome emphasis on 'knowledge' as well as 'skills' (although the vocabulary is more reminiscent of the pre-1970s and suggests something of a political, rather than simply intellectual agenda). However, it is underwhelming in its progression (and dare we say excitement?) from GCSE to A-level. The A-level part, thankfully, is now to be reconsidered. There is a welcome 'return' for Physical Geography as an integral and essential part of the subject – environment has been recaptured from an uncertain and minor place in the science curriculum - and the school curriculum is thus consistent with Geography's university profile where roughly half the research output (as returned in the 2008 RAE is 'physical'). But there are other boundaries to cross: there is at least a generation of Geography teaching professionals with little or no Physical Geography background, and recurrent cohorts of student who find the inclusion of science in an otherwise 'humanities' portfolio both baffling, and lacking in support and contextualisation. Such issues are exacerbated where some schools continue to treat a humanities 'choice' as a single offering, dividing History from Geography let alone Geography from Chemistry, Biology or Physics. Some of the 'boundary crossing' we need to address is, therefore, not from within but involves wider curriculum structure, and the nature of disciplinary configurations in and beyond the school. There are also worries about how to teach basic scientific content for the applied environmental sciences: for example, exactly what *do* you need to know to explain how a pebble moves along the bed of a river, and how do you scale this up to questions of river management?

Geography in the UK has wrestled for more than a century with itself as well as with other disciplines for its unique identity, and its place in the educational and intellectual hierarchy. In some respects, it is, literally, an *incredible* subject, seeking connections between radically disparate knowledge sets, and over so many time – and space – scales. As a subject, it can be just too much to comprehend in conventional terms when viewed against the clearer, narrower, reductionist and specialist disciplines. Because of this, geography seems necessarily, and more easily, considered as more elementary than advanced; more for the generalist than the specialist, and as an entertainingly topical, if not deeply engaged, subject for the wider academy to apprehend from behind their clearer boundaries and narrower territory. But times may be changing, as the nature and

scale of human–environmental issues demand some revisiting, reinterpretation and reinvention of our incredible project. We should look with more confidence at our own strengths and potentials, 21st century societal and environmental challenges – those really big questions of food, water and energy security and the fundamental revaluing of place and person in the face of multiple waves of globalisation – which pose boundaries for other subjects to cross with difficulty, but which our subject may cross with relative ease. There is, then, an altogether more positive, and potentially more enabling exploration of boundary crossing than the more traditional ones focused on concerns of fragmentation and divides. Here, just three examples might provide a start for a more entertaining, enriching and enabling series of debates and conversations focused on such reframing of boundary crossing ambitions and activities.

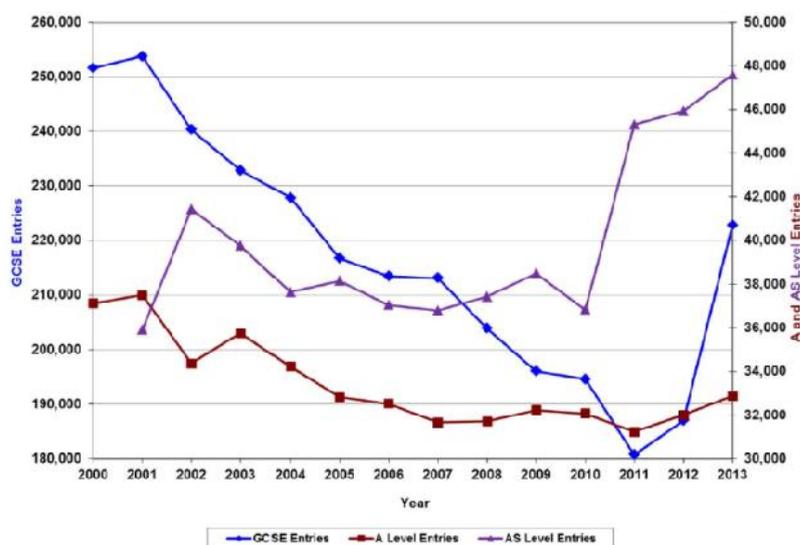
First, crossing boundaries implies a forward trajectory – a continuing ambition of exploration and discovery - affected by heroic pioneers and visionary leaders. We might congratulate ourselves on the individual heroism front, which is played-out day-to-day with the challenging student, the difficult classroom, or the failing school. A degree of heroism might, too, be felt by those rapidly responding to a really dynamic HE sector which is so quickly (and so uncertainly) changing from a public to a private good where the student market increasingly pervades university policy and identity. But what about the visionary leadership? As someone educated in the UKHE of the 1980s, I benefitted from the visionary passion for geography of those such as Dick Chorley, Peter Haggett and Rex Walford, and the deep theory but strong engagement of Doreen Massey. But where is that vision and scale of ambition today? Who is at the helm and looking to the new horizons? Have times and circumstances changed? A recurrent quip at national strategy meetings for the subject, is that, despite the best efforts of the GA and RGS, we never have the constituency/lobby group of History, and it seems this is most often associated with the lack of ‘public intellectuals’ who exert influence in high places and look outward and beyond the subject. A little like the Olympic figure skating, we have been waiting for over 30 years for a recurrence of gold medal front runners. Perhaps we should try harder, have more confidence, and set ourselves a tougher, more productive training regime – and then success should not be far away?

Second, as the scale of human–environmental challenges increases, boundaries between subjects *should* be crossed, and Geography is innately well-positioned to lead. We commonly emphasise the multi-dimensionality and complexity of the global grand challenges. All have been considered (and taught) in multi-disciplinary fashion, where experts offer their own perspective on particular aspects of the matter at hand; and through interdisciplinary study, where those from varied backgrounds unite to work in teams or in programmes to address such questions of increased scope and scale. But what is really needed is a new paradigm of transdisciplinary study. This is, in essence, a new way of thinking about new kinds of problems, where a holistic viewpoint is enabled using and merging concepts from multiple disciplines and not simply juxtaposing, but crossing multiple disciplinary boundaries. From this perspective, the global grand challenges are no longer easily reduced into their component parts; their properties emerge from complex interactions over many timescales. Most importantly, with this scale, complexity and emergence comes uncertainty – ‘true’ scientific uncertainty, where problems of measuring, modelling and representation are inherent, but also uncertainty arising from unstable public valuations, experiences and expectations. These are hybrid problems lying between and across the physical, environmental, social and economic boundaries, manifesting at scales relevant from personal experiences, through national to transnational politics and legislative frameworks.

In the late 1980s, looking ahead to the new Millennium, David Stoddart made an impassioned plea for Geography to scale-up its ambition – to address really big, important questions of the time – and now, perhaps, some of the institutional, disciplinary barriers to doing just that are at least removed in the increasing recognition of a new socio-environmental epistemology. The recent Presidential Address to the RGS by Dame Judith Rees has a welcome resonance with this older call (and provides a welcome example of disciplinary leadership) for the post-Millennium generation, identifying Geography’s potential role in ‘nexus’ thinking regarding food, water and energy sustainability. Boundaries between aspects of the earth-environmental systems are crossed all the time, for example, in the still new transdisciplinary field of Earth System Sciences, often with a focus on the Anthropocene (itself an example of mixed nomenclature and boundaries crossed). While threatening when seen as a reworking and appropriating of traditional Physical Geography, ESS could be a reimagining of that older project for a new, technically able and ambitious subject. For those worried about an implicit trend to excessive instrumentalism in the ESS or even ‘nexus’ agenda, Kates’ identification of sustainability science is another beautiful exemplar of an integrating, holistic and ambitious project without boundaries, where individual, place-based and indigenous knowledge are essentially complementary to hitherto top-down broad scale science and sustainable development policy.

Third, and finally (and much less loftily!) the boundary from school to university is in most respects looking strong. Recent indicators (see Figure 1) on the performance of the subject at GCSE and AS/A2 for the 2013 entry are promising: at GCSE, the number of pupils studying Geography has risen for the second year running to 222,852 (up 19.2%); at advanced levels the number of pupils studying Geography increased for the second year running to 32,872 pupils at A Level (up 2.7%) and 47,586 at AS Level (up 3.6%). The longer-term strength will, of course, depend on the response to the new national curriculum, and numbers are well down on the Millennium high apart from AS. The conversion to A2 may yet be a challenge as the status of AS itself diminishes, and we need to plan for this, as a significant and perhaps the most immediate internal boundary to be crossed!

Figure 1: numbers of public examination entries for Geography, 2000 – 2013. Source: <http://www.jcq.org.uk/> and RGS/IBG



Averaged and aggregated statistics of course, mask a more complex picture: some institutions and HE departments are struggling to maintain intake at reasonable quality; others are seeing increases well into double figures over the past two years. The university recruitment trend is thus an evolving one, where differentiation in the new market is clearly underway but not yet fixed. Whether this leads to new boundaries (a return to the older tri-sector model by a new name?) or whether it leads to a more imaginative solution than ‘one size fits all’, lies, at least in part, in our hands as those with key roles in the various stages of the

school-university continuum. Let us, then, recognise, use and conquer all sorts of boundaries old, new and emergent: for an incredible subject such as ours, crossing them should be a joy!

Iceland – innovations in green energy production

Emma Rawlings Smith
British School – Al Khubairat, Abu Dhabi

Domestic energy security, renewable energy and the importance of economic growth after the global financial crisis are all important concepts to understand at A level. This article outlines recent developments in renewable energy taking place in Iceland, a country at the forefront of geothermal research.

The long, cold and dark Icelandic winters experienced close to the Arctic Circle might not be attractive to most Europeans, but while the climate is harsh, there are many geographical benefits of living in the middle of the Atlantic Ocean. Iceland is a supramarine section of the Mid-Atlantic Ridge, lying above a vast and active magma hotspot and it is composed entirely of igneous rocks extruded over the last 24 million years. Landsvirkjun, the national energy company, has taken advantage of these natural resources by utilising heat from the earth, the force of the wind and falling water. Landsvirkjun is very innovative with their methods of space heating and electricity generation, making energy prices some of the lowest in the European Union. Around 90 per cent of buildings across the island are now geothermally heated through district heating systems. The steam from Svartsengi geothermal field also being used to generate electricity, lighting the runway at Keflavík International Airport and welcoming over two million visitors to the island every year. Landsvirkjun is proud to advertise their energy as competitive on price, 100 per cent renewable, with security of supply. For any energy-intensive industries these credentials are incredibly appealing. Landsvirkjun is hoping that Nesjavellir geothermal power station will sign long-term agreements for fixed-price energy supply. The island has also attracted several aluminium smelters and data centres to relocate to Reykjavík. Photo: Gretarvarsson



(public domain [WikiMedia international](#)).

Industrial energy demand

Energy consumption per capita in Iceland is the highest in Europe at around 5.9 kW per person. The Independence Party who led the country until the financial crash in 2008 encouraged power intensive industries which consume two thirds of all electricity generated in the country. The long-term agreements, favourable energy prices, and an unparalleled security of energy supply attracted three multi-national aluminium smelters to the island. Each of the smelters has access to its own associated power station. The Canadian company Rio Tinto Alcan set up business in Reykjavík in 1969 and now produces 190,000 metric tonnes of aluminum every year. Century Aluminum located their production in Grundartangi in 1998 and was joined by another American firm Alcoa in 2008. Iceland's energy production doubled between 2002 and 2008, when the huge 650MW Kárahnjúkar power plant, built in the eastern part of the highlands, went online to serve the needs of the Alcoa smelting plant. The energy used by the Alcoa smelter is enough to power a city of over one million people. Over a thousand tons of aluminum is now produced every day in Iceland, with annual production in the range of 800,000 metric tonnes.

Fuel transitions in Iceland

The first geothermal heating station opened in Reykjavik in 1928 and enabled pipes fed from the nearby hot springs to run hot water under the floors of homes. Today, geothermal energy from the nearby Reykjanesgeothermal power station heats all the homes in the capital, as well as the Blue Lagoon, Iceland's premier tourist attraction. The first commercial hydropower station was opened in 1937 at Ljósafoss, with the installation of two 4.4 MW turbines, turned with water from the river Sog. This marked the start of a new government campaign to replace coal with renewable energy. It took the 1973 global fuel crisis for Icelanders to make a complete fuel transition away from expensive imported fossil fuels and to further innovate using local natural energy sources. Today, Landsvirkjun operates 13 hydroelectric and two geothermal power stations across Iceland in five areas of operation. In 2011, a total of 17,210GWh of renewable electricity was produced in Iceland (Orkustofnun, 2012) and yet, the country has only harnessed around a fifth of the potential resources available, although the ecological fragility and aesthetic beauty of potential sites may prevent further developments.

Landsvirkjun also have plans to build a £4.3bn billion sub-sea electricity cable that could see the export of enough geothermal and volcanic energy to the European market to power 1.25 million homes. The project could meet 1.5 per cent of UK electricity demand and would undercut current offshore wind costs by 15 per cent. The project would need to be underwritten by the British government, but this seems unlikely after the election of the nationalist Prime Minister, Sigmundur David Gunnlaugsson, who blocked financial settlements after the financial collapse of the Icelandic bank Icesave (Bowers, 2013).

Air pollution and over-abstraction from geothermal sources

Renewable energy sources including hydroelectric and geothermal are preferable to fossil fuels. Geothermal fields produce only about one-sixth of the carbon dioxide that a modern natural-gas-fueled power plant produces. However, their use still impacts on the environment.

- Geothermal fluids contain the dissolved gases carbon dioxide, hydrogen sulphide (a gas that smells like rotten eggs) and perfluorocarbons, which are released into the atmosphere at the site of abstraction. These gases are denser than air and can collect in valleys or confined spaces. Hydrogen sulphide has been known to trigger eye irritation, tiredness and headaches and in rare cases serious neurologic damage or death. Studies by the University of Reykjavík indicate that the use of medicines for asthma and heart disease have significantly increased in communities living close to geothermal power station. However little research has been carried out on the long-term impacts of low sulphurvalency on people's health. This is a concern when Iceland's Public Health Authority has measured rises in sulphur levels of 140 percent at Hvaleyrarholt, close to Hafnarfjörður, since production of geothermal energy at Hellisheiði began eight years ago.
- It is a misconception that geothermal areas can provide heat for many decades. These are quite fragile features and excessive rates of water abstraction can cool the field and other associated geothermal features (such as mud pools, sinter terraces, geysers, and fumaroles). Extracting geothermal fluids can also reduce the pressure in underground reservoirs and can cause the surrounding land to sink, damaging power station infrastructure such as bores, pipes and roads.

New energy technologies

In the years after the financial crash, the newly elected social-democratic government encouraged long-term social and environmental sustainability, reducing the exploitation of natural resources for economic gain and encouraging a new green economy. When the NATO air base, located next to Keflavík International Airport was scheduled for closure in 2006, the opportunity arose for an innovative, green industry to be developed. The 45-acre site on the Reykjanes peninsula in southwestern Iceland is well-placed to access the national electricity grid, high-speed broadband and global air routes. Northern Europe, with a cool climate, was an ideal location for a green data centre. By 2008, a state of the art, \$700 million green global data centre was designed and constructed by Verne Global. The biggest attraction of the site, for the data centre industry, is fixed power prices at 4.5 cents per kilowatt-hour for up to 20 years. Heat wheels, designed as a cheaper alternative to air conditioning in cooler climates, funnel hot air out and cool air in, saving over 75 per cent of traditional cooling costs. Although some might see Iceland’s location as a tectonic risk to avoid, Verne’s designers have argued that the country’s position half-way between North America and Europe makes for an ideal location for centralizing data. The \$300 million Emerald Express Trans-Atlantic Cable System, linking Belmullet in Ireland with New York and Grindavik in Iceland, will begin operation in 2014 and provide a new super information highway across the Atlantic.

In April 2013, the right-wing coalition led by the Independent and Progressive Parties were voted back into power. This political swing of the pendulum could see rapid growth of new energy industries and spell trouble for the environment. Carbon Recycling International (CRI), a Reykjavik-based clean-tech company, have developed an emissions-to-liquids technology to fuse waste carbon dioxide from the Svartsengi geothermal plant with hydrogen, to create renewable methanol branded as Vulcanol. This product was first exported to Rotterdam in February 2013, where the Dutch oil company Argos blended it into biodiesel.

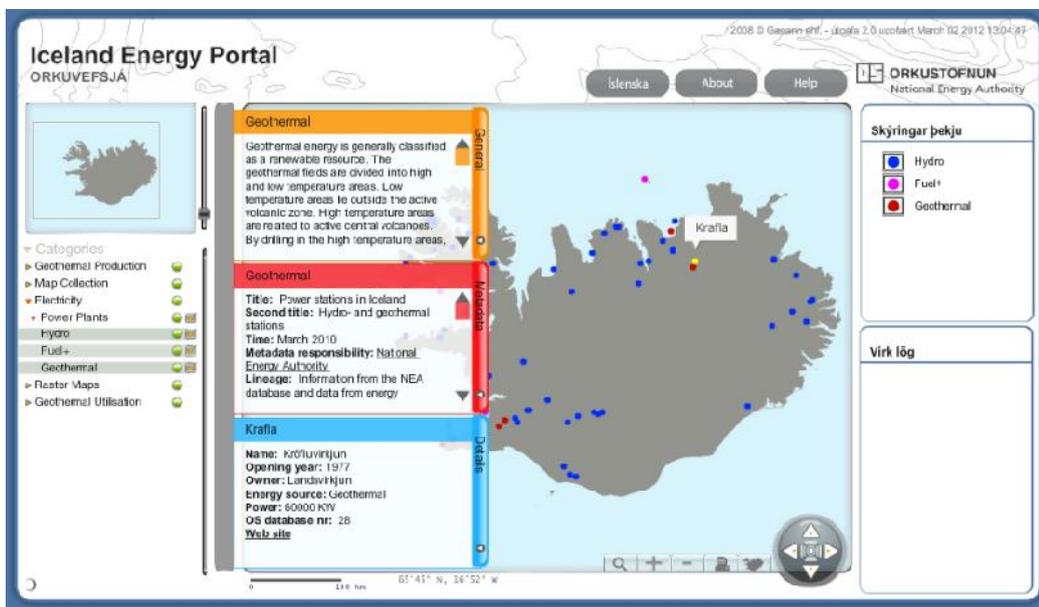


Figure 4 The Iceland Energy Portal with the location of Kefla

<http://www.nea.is/the-national-energy-authority/map-servers/iceland-energy-portal/>

The Icelandic Deep Drilling Project (IDDP) is a research and development project which has been drilling boreholes up to 4.5km deep into the crust in an attempt to harness geothermal heat. In 2009, at Krafla volcanic caldera in northeast Iceland, the project suddenly stopped as rhyolitic magma flowed into borehole IDDP-1 at a depth of 2.1km. Although dangerous, the situation was controlled and a valve added to the borehole. Over the

next two years a flow test took place and was only terminated when the well head master valves failed, under searing temperatures of over 450°C. A full edition of Geothermics Journal (Elders, 2014) is focused on this project. This project has shown the potential of coupling magmatic heat sources with hydrothermal systems, however the risks and potential environmental impacts of such operations have not fully been comprehended. In December 2013, two Enercon E-44 wind turbines were erected at Hafíð in the south of Iceland, on the site of the Búrfell Power Station. The 77 metre high wind turbines have a combined capacity of 1,800 kW, and although they are not currently a significant energy producer, they are part of a programme of energy diversification and research, testing whether winter ice may cause operational problems for this type of technology. The continual process of research and innovation is essential in Iceland, especially when the consequences of climate change are likely to see greater variability in precipitation, ice melt, river flows and therefore energy security. Rates of river flow are expected to become much greater, fed by Vatnajökull, the largest ice cap by volume in Europe, which is melting at a rate of one metre per year.

Strangely, the flow rates measured over the last two years do not support these expectations. Winter temperatures have in fact been colder than expected and reduced snowfall is having a significant impact on both the amount of water flowing in rivers and the hydroelectric potential. The reduction of water levels is not isolated to one or two rivers. March water levels at Blöndulón (Figure 2), Háslón and Þingvallavatn are the lowest they have been for several years. Low river measurements at Háslón have caused Landsvirkjun to issue energy supply warnings to major energy customers. The energy forecasts for the massive 690 MW Fljótsdalur Power Station, which powers Alcoa’s aluminium plant in Reydarfjörður, will be reduced by ten per cent this year, as water flow originating in the highlands north of the Vatnajökull Glacier has dropped dramatically.

Blöndulón Water Levels

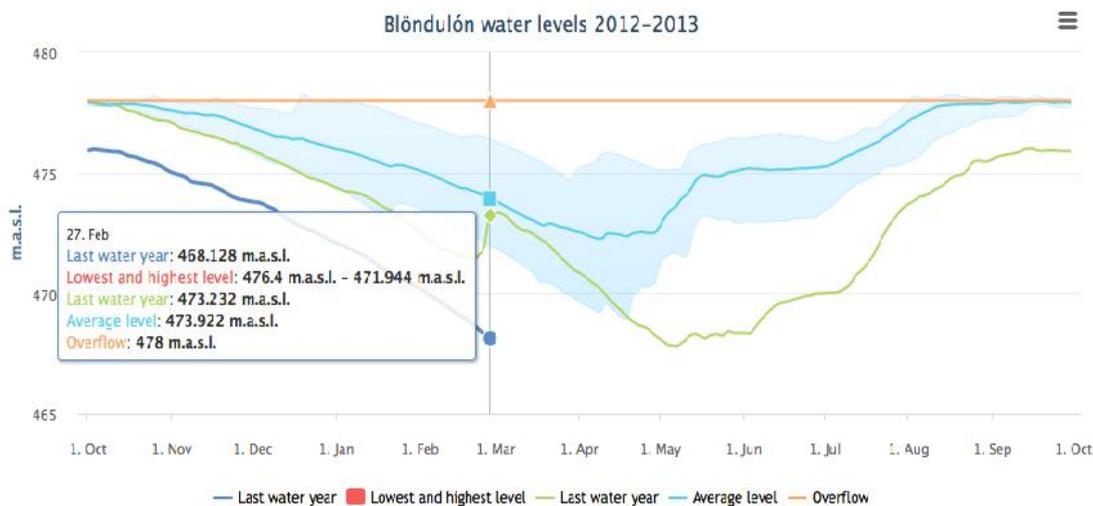


Figure 2 Falling water levels recorded over the last 17 months at Blöndulón source. (Landsvirkjun 2014)

Geothermal and hydroelectric power supplies around 80 per cent of the country’s energy, while the remaining 20 per cent is imported petrol and diesel for cars, buses and the local fishing fleet. If the government is serious about becoming a carbon-free and oil-free country they will need to find a viable alternative transportation fuel and shut down the only remaining oil power station. There are a number of potential replacements



for fuel. Electric cars that run on local renewables is one possibility, methane production

Figure 3 A hydrogen fuel station in Reykjavik.

Photo: JóhannHeiðarÁrnason

(Creative Commons) http://en.wikipedia.org/wiki/File:Hydrogen_filling_station.JPG

from local farm waste is another, and an older and perhaps more realistic solution is hydrogen. Hydrogen is not an energy source; rather it is an energy carrier. Since 1958, a state fertilizer plant near Reykjavik has used hydroelectricity to split water into hydrogen and oxygen in a process called electrolysis, producing more than 2,000 tons of liquid hydrogen annually in preparation for the manufacture of ammonia. Expansion of this process has great potential to switch away from the use of oil for transport. Hydrogen was first sold as a fuel for transportation in 2003 by Shell, from a hydrogen fuel station in Reykjavik (Figure 3).

This was part of the Ecological City Transport System project involving three hydrogen fuel cell buses. The trial was the first step towards a proposed hydrogen economy, planned for 2030. One of the key aims was to locate at least 15 hydrogen fuel stations along Route One, the national highway that runs 828 miles around Iceland (www.newenergy.is). However, the financial crash of 2008, which halved the value of the Krona, halted this transition in its tracks and the new hydrogen stations are yet to be built.

What is clear from these highly technical projects is that Iceland is pushing the boundaries of new innovation in their drive for energy and economic security. Only time will tell if they will be successful.

Further resources

Find out more about Vulcanol on the CRI website: <http://www.carbonrecycling.is>

Research how the weather in Iceland is changing at the Iceland Met Office: <http://en.vedur.is>

Explore Iceland's Energy Portal (Fig 4): http://gilslaug.orkugardur.is/vefsja/orkuvefsja_en.html

References

Bowers, S. (2013) 'Iceland seeks UK funding for subsea cable project', *The Guardian*, 27.10.2013. Available online at www.theguardian.com/world/2013/oct/27/iceland-seeks-uk-funding-cable-project [last accessed 4 March 2014].

Elders, W. (2014) Iceland Deep Drilling Project: IDDP-1, drilled into Magma *Geothermics*. 49, 1-128 (Jan 2014) Available at www.sciencedirect.com/science/journal/03756505/49/supp/C

Landsvirkjun (2014) *Blöndulón Water Levels 2013*. Available online at: www.landsvirkjun.com/researchdevelopment/environmentalmonitoring/blondulon-water-levels/ [last accessed 4 March 2014].

Orkutölur (2012) *Energy Statistics 2012 Iceland*. Available online at: http://www.os.is/gogn/os-onnur-rit/orkutolur_2012-enska.pdf [last accessed 4 March 2014].

Eco-Schools

Kieran Ellement
Barr Beacon School

Having trained in schools which were not a part of the Eco-Schools initiative, I was intrigued when starting my first term as a Newly Qualified Teacher in a school which holds the prestigious 'green flag' award. Within my first week at Barr Beacon School it was clear to see that there were some fantastic things going on in terms of environmental awareness and sustainability, a concept which, as a geographer, I feel should be embedded in the minds of all young people today.

Eco-Schools is an international award programme that guides schools on their sustainable journey, providing a framework to help embed key principles of environmental education into the heart of school life. It is founded by the Foundation for Environmental Education (FEE) and is a non-governmental, non profit organisation.

The idea is that schools will take an interest in the environment and sustainability of their establishment as well as the surrounding area. The initiative was set up in 1995 following the Rio Summit and has grown in popularity ever since.



Source-
<http://www2.keepbritaintidy.org/ecoschools/aboutecoschools/ecoschoolsstats/awardsbyregion>

Why Eco-Schools?

The Government is committed to sustainable development and the importance of preparing young people to consider the environment for the future. Schools are encouraged to make their own judgments on how sustainable development should be reflected in their ethos, day-to-day operations and through education, with a belief that schools perform better when they take responsibility for their own improvement.

The Government's white paper, *The Importance of Teaching* (2010), will free teachers from unnecessary statutory duties, creating increased opportunities for different routes to learning, including learning outside the classroom, which can support educational attainment across the curriculum. The Natural Environment white paper identifies that:

"The study of science and geography ignites pupils' curiosity about the world around them. They discover how scientific ideas contribute to technological change and improve quality of life. They recognise how human activity and natural processes can lead to changes in the environment, and engage with scientific debates, addressing important issues such as climate change."

With environmental awareness at the centre of the Government's attention, the popularity of Eco Schools has continued to grow and currently 17,325 schools have registered. A series of awards require a school to self-assess their establishment against a set of criteria.

- Bronze award: a school must have an eco committee, conduct an environmental review and have clear links to the curriculum.

- Silver award: a school must demonstrate all of the bronze criteria in addition to wider school and community work.
- The green flag award is not self-assessed and requires a desk assessment followed by a visit from a member of the eco team. Of the 17,325 currently registered, 1,745 presently hold the Green Flag, 5,522 schools have gained the silver award and the remaining 5,092 have received the bronze award.

The Eco-Schools initiative focuses on allowing schools to assess how environmentally friendly they are and work on ways of improving to become more sustainable. The key to this success appears to be involving the pupils and allowing them to come up with their own ideas to improve their school.



Such successes have been implemented at Barr Beacon School, evidenced by its green Eco-Schools flag, supported by numerous certificates along the corridors. It didn't take me long to see why Barr Beacon School have been awarded the Green Flag status. To begin with, every classroom has a waste paper bin which is monitored by the schools eco committee, run by pupils. Along the corridors you will see stickers reminding pupils and staff to switch off lights to save energy (Figure 1). Step inside the classrooms and you will see lights which have red stickers on reminding users to be more energy efficient, reducing the school's running costs

and therefore carbon footprint.

Figure 1 Lighting awareness

Source-

<http://www.barrbeaconschool.co.uk/?p=7931>



Outside is an eco-greenhouse which was built by the pupils from recycled plastic bottles (Figure 2). Pupils and staff were asked to bring in recycled plastic bottles, totalling at 1,500 in order to construct the green house. With help from staff and pupils the eco-greenhouse was constructed to form a feature in the school's eco-garden and can be used as an educational tool for future classes.

In addition to work within the schools grounds the eco-committee has also extended their work into the local community, working alongside the council. Myfirst trip with the group out of school

Figure 2. The Eco-greenhouse

Source-<http://www.barrbeaconschool.co.uk/?p=7931>

was to accompany the eco- committee on a trip to the local park. The trip was organised to help litter pick emphasising the importance of Eco-Schools, not only to the pupils in school, but also to the local community. It was a positive experience to be part of a team of young and enthusiastic people with a genuine interest in the environment around them.

The Eco-Schools project is not just supported by the lower school but also by students in the sixth form. Enrichment activities provided by the school ensure that Eco-Schools is an option open to students with an interest in global issues on a local, national and global scale. The course follows a similar structure as the Eco-Schools lower down in the school and aims to give sixth formers a well rounded environmental education. Previous years have worked on conservation and studying the local habitats around the school.

Want to get involved?

There are many excellent projects to get involved such as the 'World Action Day' which assess energy consumption in school and currently have 36 countries across the globe with 1470 schools taking part. Furthermore, there are resources and activities provided by the Eco-Schools website which allow for whole school involvement in environmental awareness and sustainability. In my opinion, it is a great way of allowing pupils independence in making their school more sustainable and can be a fun way of learning about environmental protection which will hopefully continue to be important to pupils once they have left education.

Having graduated from my PGCE with very little knowledge of the Eco-Schools initiative, I have well and truly had my eyes opened to the fantastic work which is going on in Barr Beacon School, as well as many others schools across England. The work undertaken by the staff and pupils at Barr Beacon School is admirable and, with sustained work, will continue to inspire and educate future generations of young people to live and make positive changes in a world of uncertainty.

References

Barr Beacon School.(2012). *Eco-Greenhouse Project*. Available: <http://www.barrbeaconschool.co.uk/?p=7931>. Last accessed 11th March 2014.

Department for Education (2010). *The Importance of Teaching (White Paper)*. London: The Stationery Office.

Eco-Schools.(2014). *World Days of Action*. Available: <http://eco-schools.org/wda/country/?countryname=England>. Last accessed 11th March 2014.

Questionnaire on BTEC Level 3 Course on Environmental Sustainability

The Post 16 & HE Phase Committee is currently seeking feedback on the BTEC Level 3 Course on Environmental Sustainability, which was accredited on the Qualifications and Credit framework for first teaching from September 2011.

This course has substantial elements of geographical, environmental and earth science topics. The Post16-HE group is interested in obtaining teachers' views on its content, delivery and its appropriateness for students in preparation for FE, HE and the workplace. We will then be able to collate a response and comment on decisions associated with this course.

If you teach this course and would be willing to share your thoughts, please collect a questionnaire from the Post 16-HE stand, or contact Helen Horeat helen.hore@ntlworld.com

A-level Geography: the verdict

Geography students at Bancroft's School

Four Year 13 students at Bancroft's School look back on the highs and lows of their course (Edexcel). They compare notes on what they've learned, how this differs from their initial expectations and what they feel the legacy of the course will be, both in terms of (i) specialist knowledge and (ii) transferable capabilities.

Hannah, Aditi and Claudia all intend to take the subject further at university. Dan will be studying medicine which may make his comments especially interesting to practitioners of geography. All are high achievers.

Looking back what, if anything, has been different about the A-level course compared with your initial expectations?

Aditi Honestly, I thought the A-level course would mean memorising more textbook case studies but instead I found myself immersed in newspapers reading up on current affairs.

Dan On the whole, the course has not been different to my initial expectation. But it has been much more interesting and enjoyable than I first thought.

Claudia It involved a lot more independent research than expected, particularly Unit 4 [*the research report based on individual study*]. The course incorporates so many contemporary issues (superpowers), encouraging us to read more around our subject.

Hannah There hasn't been much different, the two things would be the increased independent studying that is required throughout both the units, but I don't think that is a negative aspect. Also, the jump from GCSE was larger than expected, but that was the same throughout my subjects and I think is inevitable.

*Which topics have you **enjoyed** most/least and why?*

Aditi My favourite topic is globalisation; I felt grounded realising how small I am within such a big busy world. Energy security also appealed to me greatly as I enjoy geopolitics and was fascinated to learn how countries can exploit their natural resources as a 'weapon'.

Dan I enjoyed the whole course but if I had to choose one topic then I would choose the cultural geography research topic.

Claudia The most: globalisation, tectonics, superpowers. The least: extreme weather.

Hannah I most enjoyed learning about culture and globalisation, whereas I didn't particularly like the topic of climate change at AS because it was a very broad topic, with a lot of detail in each section which made it difficult to fully grasp.

*Which topics do you think have been most/least **useful** to learn about and why?*

Aditi Gaining a preliminary understanding in extreme weather/climate change was extremely useful given the extreme weather that UK is facing today. Personally I found the key concepts encompassed in the development gap topic highly applicable to my economics Unit 4 paper on the global economy.

Dan The research topic has been useful especially with the style of the problem-based learning at medical school. Also learning about different cultures and how dynamic it is giving me an idea of some issues I may encounter as a medical student and doctor.

Claudia All the Edexcel Unit 3 topics are extremely relevant to global issues today, which are very useful to be aware of.

Hannah I feel as if the energy topic was particularly useful, particularly in regards to the current Russia/Ukraine issue, and in this aspect superpowers as well, as they seem most current throughout everyday news stories. However, I feel as if some aspects of development and biodiversity were less useful as we had learnt about them to a large extent at GCSE level.

Has the course, and the assessments used, helped you develop skills and capabilities that you see as having lasting value, and what are they?

Aditi Unit 4 in particular has aided my preparations for higher education as it was the first time in any subject that I had to work independently, conduct research and acquire skills such as referencing. I am a waffle, so more than anything the examination has taught me how imperative it is to be concise and direct when conveying my opinions.

Dan I have been able to develop skills associated with getting relevant information from newspapers and different textbooks which will be relevant for university and continued learning in medicine.

Claudia Particularly, A2 has taught me to work far more independently. When reading around my subject, the course has taught me to effectively collate case study information and summarise that in my work. The skills gained from evaluation are also very useful.

Hannah I think it has helped me develop skills, particularly in terms of Unit 4 as I think the assessment style and the independent learning aspect be valuable for when I go onto further study at university.

What, if any, improvements in the course and assessments used, might future generations benefit from?

Aditi I think students would benefit from having to research elements of other units independently, purely in order to prepare them for the extensive research required for Unit 4.

Dan It was a good course and I cannot think of any improvements.

Claudia Particularly, A2 has taught me to work far more independently and when reading around my subject, the course has taught me to effectively collate case study information and summarise that in my work. The skills gained from evaluation are also very useful.

Hannah I think it has helped me develop skills, particularly in terms of Unit 4 as I think the assessment style and the independent learning aspect be valuable for when I go onto further study at university.

Well done! Many thanks to Aditi, Dan, Claudia and Hannah for sharing their views. Ed.

Teaching Extreme Weather - A Case Study: North America January 2014

Helen Hore

Introduction

Although we have had more than our fair share of extreme weather in the UK over the past year, many parts of the USA are frequently faced with all manner of extreme and severe weather occurrences. This winter, January in particular, brought a severe cold wave to many central and eastern states and beyond. Preparation is needed to help people cope with such events. If your students have heard enough about flooding this year, the following two lessons provide an introduction to extreme cold weather and a short case study based on recent weather in the USA which could be used for AS Edexcel Extreme Weather or WJEC A2 climatic hazards.

Case Study

During the winter of 2013-2014, in central and eastern areas of the USA and south-eastern Canada, weather conditions became extreme, in places which would normally experience wide seasonal variations. As an example, Chicago's monthly average temperatures for four months in the year have been recorded as follows:

Month	Average monthly minimum °C	Average monthly maximum °C
January	- 8	1
April	6	15
July	19	29
October	8	18

Figure 1 Climate data for Chicago. Source: The Weather Channel

However, between 5th and 7th January 2014, temperatures as low as -26C (-14F) were recorded in and around Chicago, well below the average monthly minimum. With similar temperatures experienced around Toronto, spectacular views of the frozen Niagara Falls were captured on the internet. New record lows were set in many areas of the continent and overall January showed mean temperatures considerably below average. The map on the BBC news page ⁽²⁾ shows the temperature anomalies recorded over the continent for January 2014.



Ohio Street Beach, Chicago in heat wave, Weather in

Michigan in January 2014- BBC news
September 2013 (Photo H. Hore)

The cause of this extreme weather was associated with the more meandering polar front jet stream (PFJS) which enabled Arctic air to escape further south than would normally be the case. The impacts of this cold snap were transport chaos, road and school closures, power failures and risks to health as wind chill reduced temperatures even further. North America suffered further severe weather in February with considerable snowfalls in the east, while the west coast is faced with abnormally warm weather for the season and a potential risk of drought this year. Better education and clearer procedures are needed to enable people to cope with the challenges of extreme weather.

Learning Objectives for 2 one-hour lessons with research task for homework.

- To define extreme weather and apply case study material in doing so
- To examine the factors that lead to extreme weather, including the role of the polar jet stream
- To assess how well people cope with the impacts of extreme weather and how this could be improved

Lesson 1

<p><u>What is 'extreme weather'?</u> There is no single definition of extreme weather but the most common definition is a weather event that occurs 5% of the time or less in a given area, which makes it rare. Therefore it has to be considered in relation to the normal range of weather in any area. The definition covers weather phenomena that are especially severe, unseasonal or at the extremes of weather records. Our determination of extreme weather events is thus dependent on the length and accuracy of the historical weather record. In January 2014, extremely low temperatures were recorded in Chicago and other areas of the USA. This BBC weather news page contains a video clip which could make a useful starter ⁽¹⁾ with the question 'In what ways is this weather extreme?'</p>	<p>Teacher-led introduction and discussion</p>
<p>Brainstorm what the different types of extreme weather could be – Students to discuss in pairs how the parameters of weather (rainfall, pressure, frost, wind etc.) can be considered extreme, in intensity or in duration and what these might be caused by.</p>	<p>Student activity followed by short recap</p>
<p><u>Case study of mid-USA January 2014</u></p> <ol style="list-style-type: none"> 1. Research the normal range of temperatures in one city in mid or north-eastern USA noting temperatures in two or four months eg. Chicago, Minneapolis, New York on a website such as The Weather Channel ⁽¹⁾ or news channels ⁽³⁾. Discuss how monthly temperatures are calculated, calculate the annual range of temperature and discuss what factors affect these values. Continental, marine and lake influences can be discussed depending on the cities selected. 2. Use the links to BBC news to find out about the cold wave affecting the north-central and north-eastern parts of the USA in January 2014. Find out: <ol style="list-style-type: none"> a) the extremes of temperature and other aspects of the weather experienced in specific places b) the reasons for this (Could be left until second lesson depending on time and ability) c) impacts on people and how well they were able to manage the extreme conditions. 	<p>Student research activities and short plenary</p>
<p>For each city summarise the normal 'climatic' monthly averages, the temperatures experienced in early January 2014 and the impacts on people in order to bring out the concept of severe weather and its problems. The map on the BBC news page ⁽²⁾ showing differences or anomalies from the usual temperature can be used to illustrate the ideas of weather variation and anomalies. Homework to research the impacts more fully.</p>	<p>Teacher-led plenary</p>

Lesson 2

<p><u>Causes of extreme weather January 2014.</u></p> <p>The cause of the weather in the USA will have been established as a result of the position and meanderings of the polar front jet stream weakening the polar vortex, so a starting point could be defining the PFJS and discussing related air masses. A further resource is the Met Office page with a video clip ⁽⁴⁾. From the video, questions can be used to draw out the different weather occurring (over the British Isles in this case) if below a northward and a southward moving jet stream; the impacts of a highly sinuous jet stream compared with one of low sinuosity; the impacts of a stationary jet stream. Some teachers like to stick string on globes and with an A2 class, it may be worth discussing divergence and convergence in relation to the PFJS.</p>	Teacher-led discussion with video
<p><u>Impacts of the extreme weather in USA</u></p> <p>With notes from the BBC video clip ⁽²⁾ and other sources on the US in January, impacts of the extreme events can be categorised into health, transport, other (eg reduced crime).</p>	Student activity to categorise impacts and how managed
<p>Lastly, it is worth discussing how the impacts could be better managed and why it is worth doing this. The video clip on the BBC page ⁽²⁾ entitled Southern Discomfort advises on correct dressing for extreme cold. Other initiatives in the US include the Weather-ready Nation scheme ⁽⁶⁾, SKYWARN ⁽⁵⁾, smartphone alerts ⁽⁷⁾ as well as government attempts to legislate for better short-term forecasting ⁽⁸⁾. An evaluation could be made of each scheme in terms of its effectiveness, cost and practicality and other ideas suggested.</p>	Student activity to research strategies for managing severe weather
<p>Groups could make recommendations about which schemes to employ first. Finally, if time, links to the wider economy can be made and the need for continued responses to our challenging weather.</p>	Teacher-led plenary

Sources

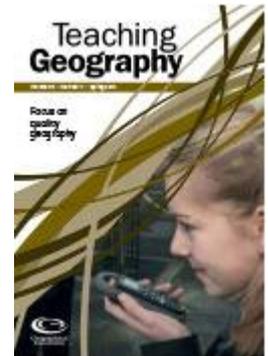
1. USA monthly climatic variations for Chicago
<http://www.weather.com/weather/wxclimatology/monthly/graph/USIL0225>
2. BBC weather news January 2014 – www.bbc.co.uk/news/world-us-canada-25647963 and <http://www.bbc.co.uk/news/world-us-canada-25632586>
3. Chicago TV January 2014 - <http://wgntv.com/2014/01/31/january-3rd-snowiest-month-ever-in-chicago-more-expected/>
4. How the jet stream affects weather - <http://www.metoffice.gov.uk/learning/wind/what-is-the-jet-stream>
5. Forecasting - <http://skywarn.org/about/>
6. Weather Ready nation – http://www.noaa.gov/factsheets/new%20version/WeatherReady_Nation_final.pdf
7. Smartphone alerts - http://news.cnet.com/8301-17938_105-57463358-1/national-weather-service-alerts-headed-to-smartphones/
8. US Bill to focus on extreme weather forecasting <http://www.climatecentral.org/news/bill-to-shift-noaa-resources-to-weather-marches-on-16256>

Inequalities in Health Care Provision

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These two case studies support the article on Inequalities in Health Care Provision in the April 2014 issue of *Teaching Geography*, which focuses on how studying health care systems can introduce students to the issues of *inequality*.



Voluntary Health Insurance: The USA

The USA has a predominantly private health care system, based on free market principles, which is in contrast to the national health care systems of Britain and France. The majority of individuals (around 63% in 2004) are covered for medical services through independent medical insurance plans which are often paid for by employers as part of an employee's total remuneration package. The value of health insurance coverage through an employer for a family of four is about \$10,000 per year (equivalent to the minimum wage in the US, or half the salary of an average Wal-Mart employee). Insurance is provided by third party profit-making organisations that factor increased costs into the American health care system. These health insurance companies are in a very powerful position and have so far resisted any changes to the US health care system with intense lobbying of the Clinton Administration. It will be interesting to see how they react to changes proposed by Barak Obama.

Despite offering a supposed free market system in which an individual can choose the provider of their health care, a system of Managed Care Organisations (MCOs) has developed in the US as a way of providing health care. An MCO manages health provision for a number of insured patients, and individuals will normally use the physician or specialists to which the plan gives them access. Insurance companies and MCOs are often selective over which individuals they will accept and the types of medical services that are covered. A system called *Medicare* exists for Americans over the age of 65 and provides insurance paid for by the state. In 2004 it provided cover for 39.7 million people. Individuals still have some level of choice of health service provision. This therefore ensures that elderly Americans have access to health care irrespective of income.

The problem with the American model is the 45.7 million people (15.3% of the population) who are without health insurance. A state 'safety net' *Medicaid* provides basic health insurance for about 31 million Americans, which still leaves around 14 million Americans with no access to health care. Those without any form of insurance have the choice of paying the full cost of treatment (which is often prohibitive), forced to 'beg' for health care from charity hospitals, or to go without.

Medicaid.gov
Keeping America Healthy

<http://www.medicaid.gov/>

President Obama came to power in the US in January 2009 promising change for the American people. One of his key domestic pledges was to reform the US health care system to provide some form of universal health coverage for all, as well as improving the quality of health care and lowering the costs.

Compulsory Health Insurance: France

In 2000, the World Health Organisation said that France provided the best overall health care in the world. France operates a health care system that is mainly funded by the government but provided through a number of social insurance schemes which provide cover for almost all of the population. In 2004, over 80% of the population were covered by the dominant state regulated insurer. Individuals must pay a compulsory health insurance of 0.75% of earnings which is deducted from their salary. The employer then makes a contribution of 12.8%. About 85% of the population also pay a voluntary premium of 2.5% of their income on top of this, to ensure that health costs are fully reimbursed. Recent health reforms have introduced a system of universal <http://www.cmu.fr/index.php>



health coverage (*couverture maladie universelle*, CMU) and those earning less than €6,600 do not make health insurance payments and are covered by the state.

Medical services are provided by generalist physicians and there are no restrictions on where doctors may set up their practices. Individuals have the choice of using more than one general physician. Access to hospitals and specialist services does not depend on referral by a general physician. Indeed some specialist services (such as gynaecology) often have community based specialist units.

Who are the Post 16 – HE Phase Committee?

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Geography Matters is the newsletter of the Geographical Association (GA) Post-16 and Higher Education Phase Committee and the University & College Union (UCU) Geography Section. The views expressed are those of the authors and do not necessarily represent those of the GA, the Committee or UCU.

The Post-16 and HE Committee promotes and safeguards the study and teaching of post-compulsory sector Geography. If you work in a school sixth-form, college or university and would like to join the Committee, please contact us. NQTs and student teachers are especially welcome. To find out more about the work and activities of the Committee, see the Post-16 and HE area of the GA's website, www.geography.org.uk.

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