



The Brighton & Lewes Downs Biosphere Partnership brings together more than forty local bodies, united in our work to connect people and nature to inspire a positive future - today.



Brighton & Lewes Downs UNESCO Biosphere - "[The Living Coast](#)"

Priority Themes in the [Biosphere Research and Monitoring Strategy 2017-19](#)

and Potential Student Projects – 2018

Our strategy aims to identify, support and disseminate research in themes that are priorities to our own Biosphere and which can also have an impact on the global biosphere network. We have identified 6 broad **priority themes** for the period 2017-19, as follows:

1. **Evolution of human-ecosystem relationships**
2. **Freshwater and marine environments**
3. **Society and environment in the biosphere**
4. **Built environment and sustainable development**
5. **Ecosystem services and green infrastructure**
6. **Climate change and resilience**

Further information on each of these themes is contained within our [Strategy](#). Our Research Working Group also encourages interdisciplinary projects that address multiple priorities.

Potential student projects that various Biosphere partner organisations have identified for 2018 are set out below by theme, and include a contact email for follow up if of interest.

If you do carry out research on one of these suggested topics, or other local research that relates to one of our priority themes, then please ensure you tell us you are doing it and then share its outcome by emailing us at info@thelivingcoast.org.uk. Thank you and good luck!

1. [Evolution of human-ecosystem relationships](#)

Research Project Proposal	Organisation	Email
Recreating palaeo-environments from key periods to understand human interaction with them. Whitehawk Hill - Neolithic - advent of farming. Adur and Ouse river systems and other capture points - Bronze Age - advent of widespread forest clearance, climate change	Archaeology South-East, UCL	<u>j.sygrave@ucl.ac.uk</u>

2. [Freshwater and marine environments](#)

Research Project Proposal	Organisation	Email
Beachy Head West Marine Conservation Zone & its Education Conservation Areas – <ul style="list-style-type: none"> • comparison between ECAs and non-ECA • comparison between the two ECAs • habitat/biotope mapping • seasonal variation • spatial variation • intertidal zonation • identification/monitoring of non-native invasive, native or rare species • ecological community studies • development of educational/engagement material • assessing natural resource value • marine litter • social attitudes to MCZs, coastal areas, the marine environment and conservation • number of visitors, use of site • use of drones for monitoring intertidal areas • comparison with SWT Shore Search intertidal surveys? 	Sussex IFCA	<u>s.ashworth@sussex-ifca.gov.uk</u>

<p>Seahorses – We know very little about the presence of this iconic species in Sussex, although they are a feature of Beachy Head West MCZ and also thought to be present in other places. Surveys can be difficult as they are elusive but snorkelling or diving surveys are options, or work with fishermen to encourage them to report seahorse bycatch.</p>	Sussex IFCA	s.ashworth@sussex-ifca.gov.uk
<p>Shellfish fishery - In the autumn of 2016, Sussex IFCA introduced a shellfish permit byelaw to manage lobster, crab, whelk and cuttlefish fisheries. There are a number of questions around these fisheries that would be useful to answer to support the adaptive management approach:</p> <ul style="list-style-type: none"> • Stock distribution? Where are the lobsters/crabs/whelks? Size/age distribution? Are there separate populations/ cross border stocks? • Do they move around at different times of year? Where do they go? Adults/juveniles? Habitat preferences? • What time of year are they most vulnerable/do they need protection? Adults/juveniles? • What is the fishing effort? How has it changed over the past 5-10 years? Where are the 'hotspots'? Where is there conflict with other fishing methods? • Is there any bycatch? What is the impact on/interaction with the wider ecosystem? • What are the threats to the continuation of the fishery? Disease/ invasive species/ climate change/ ocean acidification? Market drivers? • What are the opportunities? Sustainability certification/ marketing opportunities? • What is the value of the fishery? How has this changed? 	Sussex IFCA	s.ashworth@sussex-ifca.gov.uk
<p>Small fish survey data – Sussex IFCA conducts fish surveys at several locations on the Sussex coast, including Chichester Harbour (since 2010), Medmerry (since 2014) and Rye (since 2013). In the summer, there may be the opportunity to take part in surveys. Projects to use this data include:</p> <ul style="list-style-type: none"> • The lengths of various species (flat fish, bass, etc.) could be linked to age classes, population dynamics, health indicators, commercial fisheries or prey preference by other species such as terns • Feeding and functional guild or ecological community composition • The Transitional Fish Classification Index (as used by the Environment Agency for monitoring under the Water Framework Directive) or other ecological indices could be used to assess the health of the fish population • The location and role of nursery grounds, identifying essential fish habitat • The assessment of a range of biodiversity models and indices • Seasonal and spatial trends • Inter-annual variation • Options for increasing public involvement/citizen science • Links between fish populations and abiotic factors including habitat • Using fish as indicators of water quality, including presence of microplastic and heavy metals 	Sussex IFCA	s.ashworth@sussex-ifca.gov.uk
<p>Pilot Rain Gardens (SuDS) evaluation – Assess the hydrological functioning of two pilot Sustainable Drainage Schemes (SuDS) or 'rain gardens' established a year ago in public parks in Portslade, in terms of their effectiveness in helping to mitigate local flood risk and impacts upon groundwater quality from urban surface water runoff. Evaluation of water storage capacity, throughflow and infiltration rates during heavy rainfall episodes is needed, together with the chemical quality of water and soil relative to control and baseline samples. Scope may also exist to assess other potential benefits upon local biodiversity, public amenity and attitudes.</p>	Brighton & Hove City Council	rich.howorth@brighton-hove.gov.uk

<p>Brighton CHAMP for Water –</p> <ol style="list-style-type: none"> 1. Monitoring a nitrate precision farming trial for effectiveness in groundwater protection 2. Monitoring remediation of road run-off pollutants in rain gardens using multi-level samplers 3. Monitoring slug abundance during cover crop trials 4. Investigating effect on nitrate infiltration and mobilisation in soil during cover crop trials 5. A feasibility study of the use of horse manure on farms as a sustainable business 6. Analysis of the impact of manure piles on nitrate leaching to the aquifer in particular within safeguard zones 7. Nutrient management consideration of residual nitrogen in organic manures over time 8. Investigating public awareness of and behaviours associated with the aquifer and its use as a source for water supply 9. The impact of the 1980's Environmentally Sensitive Areas (ESA) scheme on groundwater nitrate concentrations in the Brighton Chalk block 10. Opportunity mapping for arable conversion to grassland/woodland/biomass cropping to protect groundwater 11. In-soil sampling for specific interventions undertaken by ChaMP 12. Effectiveness of rural landowner engagement methods and barriers to engagement/uptake of interventions 13. Monitoring leaching rates of slow release nitrogen compared with liquid fertiliser on chalk 14. Review of worldwide best practice for groundwater protection in chalk aquifers comparable to Brighton chalk block 15. Investigation of nitrate leaching in undersowing/companion cropping trial 16. Mapping of drainage ditches and assessment of impact of water movement pathways on groundwater vulnerability 17. BGS/university collaboration – new geomorphological/hydrological mapping of the Brighton chalk block, tracer testing and integration into conceptual models 18. Planning of Sustainable Drainage Systems for groundwater protection and multiple benefits (feasibility studies) 19. Analysis of bacterial action for pollutant remediation in Sustainable Drainage Systems 20. An investigation of nitrates in groundwater due to deposition from NOx originating from traffic emissions 	<p>Brighton CHAMP for Water project</p>	<p>aimee.felus@southdowns.gov.uk</p>
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3. Society and environment in the biosphere

Research Project Proposal	Organisation	Email
<p>Community attitudes to wildlife in the Biosphere –</p> <ul style="list-style-type: none"> o Investigate community awareness of common urban wildlife species (such as house sparrow, common frog, hedgehog, swift, starling, herring gull, fox, badger) among different communities representative of the Biosphere – including comparison of urban and sub-urban/semi-rural, wealthy and deprived wards. Can people even identify these species? o Investigate attitudes towards this wildlife and towards environmental issues in general – are they actively concerned or indifferent? Does urban wildlife matter? Or just the rainforests or Africa? o How do they find out about wildlife/environmental issues - is it all from Blue Planet? The Daily Mail? The Guardian? Social Media? Which are the trusted sources of information for which community? o Investigate these communities' levels of access to greenspace. o Do attitudes change depending on where people live? How much access to greenspace they get? Their age? Their level of education? o How do they feel they could help to look after wildlife and the environment? 	<p>RSPB – possible projects (tbc)</p>	<p>Chloe.Rose@rspb.org.uk</p>

<p>The importance of Environmental Education at Secondary School Level - Environmental education is often delivered effectively at junior school level only to be side-lined at secondary level as curriculum demands and constraints focus minds on different priorities. Yet the teenage years are the ones often most important in developing ideas and visions about the world as the mind matures enough to consider the complexities of the society we live in. Dorothy Stringer has a strong environmental education ethos, with a discrete Environmental Science course given to Year 7 and through engagement with other subjects many environmental themes are explored in other subjects throughout the school. We would be keen to know if these experiences shape our students views and aspirations compared to other secondary schools and whether they become more engaged in caring for the environment they live in (our Biosphere).</p>	Dorothy Stringer School	SDK@dorothy-stringer.co.uk
<p>Visitor surveys on urban nature reserves, assessment of sense of wellbeing when entering and leaving to see if it's improved. Assessment of wellbeing following long exposure to a wild space vs short exposure. Long term assessment of improvements of mental health. Perception of green and wild spaces in advantaged areas vs disadvantaged. Railway Land, Lewes and Castle Hill, Newhaven</p>	Lewes District Council	Rangers@lewes-eastbourne.gov.uk
<p>Recreation grounds vs nature reserves. Which provides the most benefit / well-being? Build upon / continue existing research including University of Exeter 'Green spaces may boost wellbeing for city 'dwellers' and joint research from the universities of Surrey, Exeter, Plymouth and Plymouth Marine Laboratory working with Natural England to examine the experiences of over 4,500 people regarding countryside benefits to health.</p>	Lewes District Council	Rangers@lewes-eastbourne.gov.uk

4. Built environment and sustainable development

Research Project Proposal	Organisation	Email
Study on the potential of our significant roof spaces at several locations to deliver alternative approaches. (energy/water)	Brighton & Hove Bus Co.	martin.harris@buses.co.uk
Working with local communities to explore benefits and opportunities for more housing , particularly the densification of suburban areas	Brighton & Hove FoE	ecochris.todd@gmail.com

5. Ecosystem services and green infrastructure

Research Project Proposal	Organisation	Email
<p>Collecting evidence to support the need for Green Infrastructure within an urban environment;</p> <ul style="list-style-type: none"> - Focus on Lewes Railway Land and possible Mark Release Recapture experiments of target species potentially birds, bumblebees or butterflies to better understand the need for corridors and stepping stones to allow dispersal and foraging success of such. - Great crested newt population at Eastside Recreation - understanding the impacts of the surrounding developments on the population including understanding genetic dispersal and species movements – photographing and DNA analysis of individuals within the site and other known populations in Newhaven along the Ouse Estuary. - Looking at local planning applications and where connectivity through planting and / or green space inclusion has / has not been included in developments adjacent to / surrounding the areas in question (nature reserve / recreation ground). 	Lewes District Council	Rangers@lewes-eastbourne.gov.uk
Data review using all robust and accepted data sets available, and subsequent cost estimate of the Ecosystem Services (provisioning, regulating, supporting, and cultural) provided by the Nature Reserves & Downland including calculating on a site by site and landscape scale case for Lewes Railway Land, Landport Bottom, Castle Hill, Meeching Down, Bollens Bush, Markstakes Common, Brickfields Seaford etc.	Lewes District Council	Rangers@lewes-eastbourne.gov.uk

Long term benefits of different habitat creation schemes such as “butterfly banks”	Brighton & Hove City Council	david.larkin@brighton-hove.gov.uk
Effect of grazing species on naturalness of habitats	Brighton & Hove City Council	david.larkin@brighton-hove.gov.uk
Effects of grazing timing on habitat recovery	Brighton & Hove City Council	david.larkin@brighton-hove.gov.uk
Hedgerow mapping	East Sussex County Council	kate.cole@eastsussex.gov.uk
Data collation and gap analysis of available taxa / species data sets for the Lewes Railway Land wet meadow ditches to inform pre and post survey monitoring of dredging (potentially proposed to be undertaken Autumn 2018).	Lewes District Council	Rangers@lewes-eastbourne.gov.uk
Meeching Down monitoring of sand banks in relation to habitat management regimes namely scrub and tree clearance with survey and correlations being made between species diversity notably for solitary flies / bees species?	Lewes District Council	Rangers@lewes-eastbourne.gov.uk
Studying the adder population at Marstake Common and Landport Bottom including radio tracking of animals to better inform and understand use of habitats, seasonal movements, locate hibernaculum etc, so as to inform management of such habitats targeted to better conservation of the species / populations on such sites. Potential to correlate information with studying of the local pheasant population – known predator of adders / attributed cause to adder population declines.	Lewes District Council	Rangers@lewes-eastbourne.gov.uk

6. Climate change and resilience

Research Project Proposal	Organisation	Email
Relating climate science to Kent and Sussex water availability .	South East Water	helen.chapman@southeastwater.co.uk

Note that there is also a range of research project opportunities available more widely through the South Downs National Park Authority, contact research@southdowns.gov.uk, with their 2017/18 topics in summary being:

- Catchment management ‘success’ monitoring
- Monitor the success of ‘on the ground schemes’ driven by the NIA nitrate modelling e.g. CHAMP
- Economic and tourism opportunities and challenges for the SDNP resulting from Brexit
- Effectiveness of new farm incentive schemes post-Brexit
- Extent of deer and/or squirrel damage to trees in the South Downs National Park
- Grayling Butterfly distribution on the South Downs
- Potential impacts of the expansion and creation of vineyards on the South Downs National Park, including water and soil quality
- Earth Observation as a tool to monitor landscape change
- Implications of grazing on chalk grassland
- Management techniques for the control of Tor Grass on chalk grassland sites
- Multi-user routes: investigation into surface types and user experiences in the South Downs.
- Review of Farm Diversification Schemes