

## CLAD Annual Report (2009-2010)

### Year 1

#### Introduction

CLAD, Carbon Landscapes and Drainage, is a NERC-funded knowledge exchange (KE) network initiated and maintained by the Universities of Glasgow (School of Geographical & Earth Sciences) and Stirling (School of Biological & Environmental Sciences). The Principle Investigators are Prof. Susan Waldron (Glasgow), Prof. Dave Gilvear (Stirling) and Dr Ian Grieve (Stirling). Dr Simon Drew is the Network Coordinator and manages the day-to-day activities of CLAD.

CLAD promotes improved understanding and management of carbon losses from terrestrial environments via catchment drainage systems. Stakeholders include regulators, developers, consultants and equipment suppliers.

There is currently a significant gap in scoping and environmental impact assessments on the effect of disturbance of organic-rich soils e.g. peatlands. This knowledge exchange project aims to:

- Improve dialogue between groups interested in peatland functioning and management.
- Disseminate understanding for monitoring carbon export and water quality in fluvial systems.
- Develop best practise carbon loss mitigation measures for peatland environments.

#### A) CLAD Outputs.

The CLAD KE project was initiated on the 1<sup>st</sup> of June 2009. Outputs thus far have been as follows:

- 1) **Establishment of the membership of CLAD.** Members (listed in Appendix 1) are drawn from five main groups
  - Developers (mainly drawn from the Onshore Renewables sector)
  - Regulators
  - Environmental Consultants
  - Conservation Groups
  - The research community with an interest in the peatland carbon cycle and hydrology
- 2) **CLAD Inaugural annual Meeting.** Following the establishment of the CLAD membership, the first annual meeting was organised in Oct 2009. This three-day meeting provided a stimulating forum for individuals and organisations with an interest in the carbon cycle and drainage in uplands to meet and review the latest research and knowledge in this area. The meeting also provided a networking forum for people from relatively different fields.

Presentations from the meeting, an extensive set of minutes and contact details of the attending network members have been made available on the CLAD website (see below). The meeting received a lot of positive feedback and provided opportunities for stakeholders to meet and discuss shared points of interest.

3) **CLAD Website.**

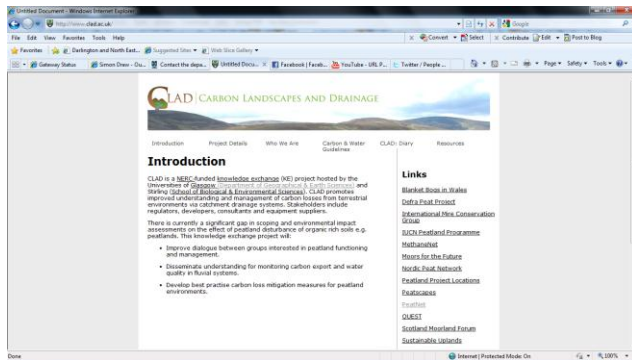


Fig 1: The CLAD website frontpage.

Following the establishment of the CLAD membership and first meeting, the CLAD website ([www.clad.ac.uk](http://www.clad.ac.uk)) was established. This was created by Simon Drew following in-house training in the use of Dreamweaver web authoring software. This site is hosted on a Stirling University server and has an 'ac.uk' domain name licensed by the JANET, the UK research and education network. This

was considered important to allow CLAD to exist without a link to one University, therefore supporting longevity past the initial funding period.

The website provides a hub for some of the communication work of CLAD. Different web pages provide a description of the work of CLAD and identify project PIs and staff, a map of individual members and member organisations, and a number of resources, including an image bank presented in photographic albums. Links to related video material (generally on Youtube) include general clips related to CLAD interest issues, and films created for CLAD, including CLAD fieldwork, and meetings (see 7 below) that have occurred over the past year. A number of new features will be added to the website this year including a literature resource with key references from relevant subfields and links to papers and grey literature available online.

- 4) **CLAD TV.** CLAD TV (<http://www.youtube.com/user/n2242880>) is the CLAD YouTube channel which hosts videos created for CLAD. It was initiated following Simon's attendance at a residential 'Science in the Media' course (April 2010). Content includes a number of films taken from the recently organised 'Windfarm Carbon Calculator Meeting' (see 7 below). To date videos posted on CLAD TV have received more than 1000 views.
- 5) **CLAD Twitter Account** ([http://twitter.com/CLAD\\_ac\\_uk](http://twitter.com/CLAD_ac_uk)): To relay quickly information about CLAD activities and interests, and to attract a wider audience CLAD now has a twitter account (CLAD\_ac\_uk). This provides links to the CLAD website. This has been active since the 26<sup>th</sup> of March 2010. Followers include regulatory agencies, academics, carbon management professionals, and media and renewable energy organisations.
- 6) **CLAD Face book Account** (<http://www.facebook.com/#!/pages/The-CLAD-Facebook-Page/118451641529954?ref=ts>). CLAD has recently started a Facebook account which also provides links to the CLAD webpage, descriptions of CLAD work, and photographic resources. Links to video work and a twitter link will also be added shortly and an invitation

sent out to CLAD members and twitter followers. Facebook membership is more widespread than for twitter, and the use of video and photographic material together with more versatility in using text allows more detailed communication of CLAD messages.

- 7) **CLAD Carbon Payback Calculator Meeting.** During the annual general meeting organised in Oct 2009 (see 3 above) it became apparent that there was some confusion within the CLAD membership surrounding the use of the Carbon Payback Calculator. CLAD organised a meeting to allow the authors of the calculator (Jo Smith and Dali Nayak of Aberdeen University) to explain the design of the payback calculator and to answer questions. This took place in the School of Geographical & Earth Sciences at Glasgow University in May 2010.

To allow those who could not attend the meeting to also access this knowledge, the meeting was filmed and uploaded onto CLAD TV (see 4, above) and posted as series of videos on the CLAD webpage. Queries regarding the calculator are now routinely referred to this resource.

- 8) **CLAD collaboration with Scottish & Southern Energy Renewables (SSER) & Boreas Ecology.**



Fig. 2 Panoramic view of Loch Brora which is the subject of palaeoecological investigations as part of CLADs collaboration with SSER.

SSER involvement as a network member of CLAD has resulted in their 50% funding of a PhD studentship. The remainder of funding for this 3.5 year studentship (July 2010-December 2013) has been awarded from the EPSRC research council and the Energy Technology Partnership. The studentship is based at Glasgow University, but supervised jointly by CLAD PIs Waldron and Gilvear. The studentship research project will use a SSER site, Gordonbush windfarm in NE Scotland, to:

- i) examine the response of the landscape to hosting a windfarm as manifest by carbon export in catchment drainage systems. This data will feed directly in refining and testing the C-calculator.
- ii) use sedimentary records e.g. Loch Brora (Fig. 1) to estimate loss of sediment and carbon from the landscape from which to assess windfarm impact, if any.

- 9) **CLAD collaboration with international partners.** During the course of 2009-2010 an opportunity has arisen to collaborate with an international partner University Teknologi Malaysia (UTM). UTM have expressed interest in CLAD to learn more about the mechanism for knowledge exchange, but our network is particularly relevant due to their hydrological interest in on-going development of deep tropical peat deposits for palm oil plantations.

CLAD are currently investigating avenues to secure funding to enable discussion to evolve into exchange KE visits and collaborative fieldwork.

- 10) **Commissioning of S::CAN Spectrolyser.** CLAD has purchased a high resolution water quality monitor (called the S::CAN Spectrolyser) capable of gathering dissolved organic carbon (DOC) by measuring its absorption of light at wavelengths between 200 and 735nm. Absorption of light by DOC generally takes place between 250-350nm. CLAD has taken delivery of this device and will be testing its capability to measure DOC. Following this phase the spectrolyser will be deployed (at a site on the Whitelee Windfarm) as soon as a protective housing has been constructed for it. This device will be demonstrated during the CLAD workshops (11 below).
- 11) **CLAD representation at non-CLAD events** CLAD members have been present a number of meeting to either promote CLAD directly through presentations or network with relevant parties,
  - Carbon in the Uplands (April 20-21 2010). SD & SW
  - Opening of the IUCN peatlands program. SD
  - SAGES annual meeting (Nov 17-10 2009). SW
  - SNH/SEPA Annual Knowledge Exchange Symposium (Feb 2010). DG

## **Year 2 (2010-2011)**

In the following year CLAD work will concentrate on three key outputs:

- 1) **CLAD Workshops.** Organisation for the monitoring workshops will be completed by mid-year 2, to allow the workshops to be held in early 2011 (date to be decided). A program for this workshop has already been drafted and broadly agreed on. As soon as the Spectrolyser is deployed in the field and is profiling DOC effectively, the workshop dates will be set.
- 2) **2<sup>nd</sup> Annual CLAD Meeting.** A draft program for this event has also been drafted and following agreement of the PIs concerning this content, preparations will begin. The meeting will concentrate on artificial drainage and hydrology KE and will seek to develop closer working relationships between CLAD members through more formal working structures.
- 3) **Carbon & Water Guidelines (C&WG).** This is a major written output of CLAD. Work has begun on the production of these guidelines. The content of the guideline will be the main focus of the final CLAD annual meeting (in Year 3). As soon as a draft version of the C&WG have been agreed by the Core CLAD team these will be circulated for discussion prior to the final annual meeting (see 2 above).

Additionally, CLAD will be engaging in a number of other projects which fall within its remit. These include:

- 1) The consultation component of the extensions to the Windfarm Carbon Payback Calculator. As a consequence of hosting the workshop on the calculator, CLAD has been asked to collaborate with the authors in a Scottish Government Funded

- revision, through both providing expert input on drainage and hosting specific consultations to build on discussions and debate initiated at the original meeting.
- 2) Collaborative work Year 3 with UTM (pending further negotiations re funding and remit for such work).

## **Appendix 1: CLAD Members**

Stakeholders		Academic	
Dr. Declan Barraclough	Environment Agency	Prof. Andy Baird	Uni. of Leeds
Mr Clifton Bain	IUCN UK Peatland Programme	Prof. Andy Baker	Uni. of Birmingham
Dr. Andy Burrows	Loch Lomond Fisheries Trust	Dr. Mike Billet	CEH Penicuik
Dr. Graham Burt-Smith	Entec consultancy	Prof. Kevin Bishop	Uni. of Uppsala, Sweden
Ms Janice Cassidy	Scottish Rural Property & Business Association	Dr. Ken Byrne	Uni. of Limerick
Dr Andrew Coupar	SNH	Dr. Pippa Chapman	Uni. of Leeds
Mr Alistair Crowle	Natural England	Dr. Joanna Clark	Uni. of Bangor
Dr Tom Dargie	Boreas Ecology	Dr. Sarah Crowe	Uni. of Highland and Islands
Ms Elene Dawkins	Wren & Bell consultants	Dr. Julian Dawson	Uni. Of Aberdeen
Dr. Catherine Farrell	Bord Na Mona (Eire)	Dr Simon Drew	U. of Stirling & U of Glasgow
Mr Miles Foulger	Yorkshire Water	Dr. Chris Evans	CEH Bangor
Ms Mandy Gloyer	Scottish Power Renewables	Dr. Dave Gilvear	Uni. of Stirling
Ms Lorna Harris	SEPA	Dr. Ian Grieve	Uni. of Stirling
Ms Jenny Hogan	Scottish Renewables Forum	Dr. Kate Heal	Uni. of Edinburgh
Mr Duncan Hutt	Northumberland Wildlife Trust	Prof. Joseph Holden	Uni. of Leeds
Dr. Pasqual Lardet	Halcrow Consultancy	Prof. Richard Lindsay	Uni. of East London
Mrs Jane MacDonald	Airtricity Developments	Prof. Adrian MacDonald	Uni. of Leeds
Mr Cameron MacIver	Cameron Ecology	Dr. Don Monteith	CEH Lancaster
Dr. Iain Malcolm	Marine Scotland	Dr. Paul Quinn	Uni. of Newcastle
Dr. Janet Moxley	SEPA	Prof. Pete Smith	Uni. of Aberdeen
Mr Allan Mowat	Atkins Global	Dr. Joanne Smith	Uni. of Aberdeen
Prof. Malcolm Newsome	Tyne Rivers Trust	Prof. Chris Spray	Uni. of Dundee
Dr. Roger Owen	SEPA	Dr. Marc Stutter	Macaulay Research Institute
Dr. Harriet Orr	Environment Agency	Dr. Adrian Yallop	Cranfield University
Mr George Ponton	Scottish Water	Dr. Jeff Warburton	Uni. of Durham
Ms Amanda Hutcheson	Scottish Water	Dr. Susan Waldron	Uni. of Glasgow
Mr Roger Powell	Process Measurement	Dr. Fred Worrall	Uni. of Durham
Dr. Geeta Puri	Scottish Government	Dr Martin Evans	Uni. of Manchester
Mr. Michael Rebane	Natural England		
Dr. Nadeem Shah	Forestry Commission		
Ms Judith Stuart	DEFRA		
Dr. Pat Thompson	RSPB		
Mr Steven Turnbull	John Muir Trust		
Ms Joanna Wright	Land Use Consultants		
Dr. Simon Zisman	RPS Consulting		