Limnology:
The Science of Lakes
Tuesday 25\textsuperscript{th} – Thursday 27\textsuperscript{th} August 2015
a course led by Allan Pentecost
at Malham Tarn Field Centre

Overview of the course

Limnology was originally defined as the science of lakes although it has now been extended to cover all open non-marine waters. In this introductory course we shall concentrate on lakes and use nearby Malham Tarn for practical work.

An understanding of lakes is only possible with reference to physics, chemistry and biology. We explore, in simple terms, the important physical processes in lakes, namely their stratification, the formation of waves and the penetration of light. One of the most important chemical factors, having a large impact on organisms, is the concentration of dissolved oxygen. We shall conduct oxygen measurements on the Tarn waters, plus some other chemical tests and see how these relate to lake organisms. Most limnological research is related to biology.

This course will concentrate on the organisms that live within the water column and will involve sampling phytoplankton and zooplankton from a boat. The organisms will be examined microscopically and the results discussed in the light of the chemical analyses. Finally, consideration will be given to the origins of lakes and their evolution with reference to the historic evidence obtained from lake sediments.

This course is suitable for all ages and aims to provide an introduction to the fascinating science of lakes and the means by which they can be studied with the minimum of equipment. No previous knowledge of lakes is required. Some boat work will be necessary but is not obligatory.

About the Tutor

Allan Pentecost has been interested in limnology for many years, having published several studies of their chemistry, history and biology, including Malham Tarn. He is currently an Honorary Research Fellow of the Freshwater Biological Association situated on Windermere and Emeritus Reader at King’s College London.

Course Level: Open to everyone
Course fees
• Resident – sole occupancy £270.00
• Resident – shared accommodation £250.00
• Non-Resident £190.00

What is included within the fee?
• Up to 9 hours of tuition a day
• Full board accommodation including a cooked breakfast, picnic lunch, home-made cakes and an evening meal. Vegetarian and other dietary options are available
• Tea and coffee making facilities available throughout the day
• Use of resources including library, workrooms, studios and the Centre grounds
• Centre organised transport during the course and most admission fees

Non-resident course fees include all of the above except breakfast and accommodation.

Booking procedure
Provisional bookings can be made by telephoning the centre on 01729-830331 or by completing the online form on the FSC website: www.field-studies-council.org

You will then be asked to complete a booking form, located within the brochure or available to print off from the FSC website. Return this to the Centre with your deposit to confirm your place (or pay deposit on-line).

Please note the booking conditions on the booking form, in the FSC Courses Brochure or on the FSC website.

Start and finish times
Please aim to arrive between 4.00pm and 5.30pm on Tuesday afternoon, allowing time to settle into your accommodation before the evening meal at 6.00pm. The course will begin formally after dinner with an introduction to the Centre.

Non-resident guests – please arrive by 5.45pm.

The course will end at 3pm on Thursday afternoon, with departure after tea. Rooms should be vacated by 9.30am.

Other Courses This Week
• Fly Fishing week (Fri - Fri)
• A visual exploration of the Yorkshire Dales
• Archaeology – The Yorkshire Dales. Landscape and History (Mon – Fri)
• Lichens in the Dales (Fri – Mon)

Your partner, family or friend could join you for your stay to do their own thing or to fish the Tarn during the fishing season. Please ask for details.

Excursions
Excursions will be by Centre minibuses. On occasion it may be necessary to use private cars, in which case anyone who kindly uses their car will be refunded the petrol costs.

Travelling here:
The Centre is located 4 miles North of Malham Village and 7 miles East of Settle.
Grid ref: SD 895673. Post code BD24 9PU.
• By Train The nearest stations are Settle and Giggleswick. We can arrange to collect you from and return you to the station by Centre minibus depending upon demand. Please call & let us know of your arrival time in advance.
• By Car Please follow the directions attached.
• Car Sharing If you would like to be put in touch with other participants who are coming from your area, please let us know.

What to Bring
• Warm clothes and a torch for evening studies.
• Waterproof Jacket and Trousers *
• Walking boots, Wellington boots *
• Warm clothing, hat, scarf, gloves; thick socks
• Small rucksack, flask / water bottle,
• Sandwich box *
• Sun cream, insect repellent
* These items can be borrowed at the Centre

Malham Tarn experiences an upland climate - at any season it can be bright and fine, but can also be cold, windy and wet. Please be prepared by bringing warm and waterproof clothing, and strong waterproof footwear.

Some surfaces around the buildings are uneven and may be slippery therefore visitors are advised to wear flat shoes.
About the centre

Malham Tarn Field Centre is one of 17 Centres in the UK run by the Field Studies Council, an independent educational charity that helps people discover, explore, understand and be inspired by the natural environment. It is located high up (altitude 381m) in the heart of the Yorkshire Dales National Park in a peaceful woodland setting beneath dramatic cliffs, overlooking Malham Tarn. The Tarn is the focus of an internationally important National Nature Reserve and the area is known for its magnificent limestone scenery, with the famous features of Malham Cove and Gordale Scar within walking distance.

Tarn House was built during the eighteenth century and extended by Walter Morrison, who inherited the property in 1857. Many eminent guests stayed at the house during his time, including John Ruskin, Charles Kingsley and Judge Hughes. The estate was given to The National Trust in 1946, who leased the House to the FSC for educational purposes in 1947. The Field Centre opened early the following year with Paul Foster Holmes as the Warden.

The Centre is an ideal place to study a variety of topics and we offer courses at all levels for schools, colleges and universities, for vocational training and a wide range of special interest courses for adults and families. At any time we may have a variety of groups at the Centre. The Head of Centre leads a well-qualified and experienced teaching team with a full complement of staff on the domestic and administrative side. Courses are also run by carefully chosen guest tutors.

Accommodation & Facilities The Centre comprises three buildings - Tarn House, North Wing and High Stables. North Wing is close to Tarn House separated by a cobbled courtyard. High Stables is a few minutes’ walk up a woodland track, where there is also a large parking area. Visitors to the Centre can expect to find a relaxed and friendly atmosphere.

Warm and comfortable sleeping accommodation is distributed across all three buildings. Many rooms have en-suite facilities, beds are prepared, towels provided and tea and coffee making facilities are available in your room.

There are four well equipped study rooms, a drying room, library, TV lounge, common room and tea room in Tarn House and North Wing. A second common room and bar are located at High Stables.

The tuck-shop sells a range of confectionery, drinks, toiletry items, stationery, postcards and souvenirs. The publications shop sells maps, books, FSC fold-out charts and keys. Note that the nearest shops and cash machines are 7 miles away in Settle.

Mobile reception is variable – public telephones are available if yours does not work! Computers have internet access, with wireless broadband accessible from your laptop, in some areas.

Malham Tarn, by Rod & Margaret Smith

Catering The dining room is located in Tarn House. In addition to a cooked breakfast and wholesome home-cooked evening meal, materials are provided for you to make a picnic lunch to enjoy wherever your course may take you. Special diets can be catered for by prior arrangement. Drink making facilities are available at all times in the tea room.

Important It is in your own interests to inform the Centre of any medical problems, disabilities, allergies or dietary requirements you may have. All information will be treated in confidence.

Malham Tarn, by Rod & Margaret Smith

High Stables
**How to find us**

1 **From Malham:** Bear left at the Buck Inn. Drive up a winding hill, and along the flat (2 cattle grids) for 3 miles to a crossroads. Go straight ahead here, past High Trenhouse (Centre for Management Creativity) and down to a junction. Turn right and drive with the wood to your right for ½ mile. Ignore the gated track and watch out for a sharp right hand turn down a slope at the far end of the woodland.

*NB Do not take the road from Malham that goes past the Listers Arms Hotel as this becomes a gated track.*

2 **From Settle/Hawes/Horton-in-Ribblesdale** Take the B6479 to Langcliffe (don’t follow signs to Malham from Settle town Centre) and turn into Langcliffe at the sign ‘Malham 7½’. Follow this road through the village, over a cattle grid, up a steep winding hill, over 2 cattle grids, down to an isolated farm and up another long hill. Bear right at the top of this hill. After just over a mile, the road forks at a small copse. Bear left here at the sign ‘Arncliffe 5¾’ (do not take the road to Malham). Continue for another mile, past a sharp right turn and a gated track. At the far end of the woodland watch for a sharp right turn.

The final turn is marked with a small sign to the Field Centre. Follow the track for ¼ mile past various cottages, through a rock cutting to the large buildings at the far end.