



Field Seminars Brochure

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Field Seminar Listing

Our field seminars cover a range of fundamental subsurface topics and datatypes aligned with our classroom curriculum. All topics are covered across BOTH Europe and US-based field sites to allow most cost-effective delivery of training based on your team's location. Our courses typically run across a work-week but can be customized for duration and content.



Field seminars (typically 5 days in length)

Play, Prospect and Field evaluation, assessment and risking:
Moray Firth Basin, NE Scotland

Play, Prospect and Field evaluation, assessment and risking:
Permian Basin, Texas and New Mexico

Updip-to-downdip play element prediction and linkage:
Western Interior Seaway, Southern Utah

Updip-to-downdip play element prediction and linkage:
Tremp-Ainsa-Jaca basins, Northern Spain

Deep-water depositional systems: reservoir and retention styles:
San Diego, California

Deep-water depositional systems: reservoir and retention styles:
Clare Basin, County Clare, Ireland

Meet the Team!

ACT-Geo and Geology Field School provide the perfect combination of expertise to deliver field-based seminars applied to subsurface teams in a safe, happy, healthy, educational and business-applied environment.

We bring subsurface data and examples to the outcrops, and all our field locations have abundant *drone-acquired photogrammetry models* at reservoir and seismic scale available that clients can access before, during and after the course. We include reservoir and seismic modeling applications of our outcrop models to apply useful subsurface analogies.



Dr. Rene Jonk: Rene has more than 25 years of experience in geoscience characterization for exploration, development and research. He held technical advisor and leadership roles with ExxonMobil and Apache. Rene holds a PhD in Petroleum Geology from the University of Aberdeen where he studied remobilized deep-water depositional systems. He is an honorary professor at the University of Aberdeen and an active member of SEPM, EAGE and the Geological Society of London.



Dr Brandon Harper: Brandon has more than 15 years of experience in industry and academic geoscience exploration, development, and research. He has been an explorationist, project supervisor, and instructor for ACT-Geo and ConocoPhillips. Brandon holds a PhD from Rice University where he studied the interactions of barrier reef systems with siliciclastic shelf margins in response to cyclical changes in sea level at the shelf to basin level. Brandon is a member of SEPM and AAPG.

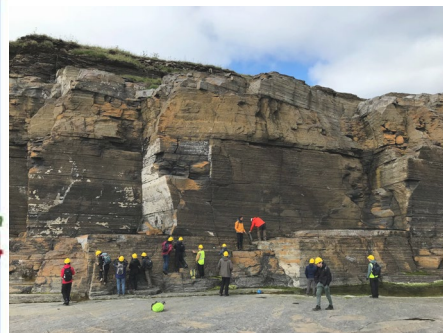
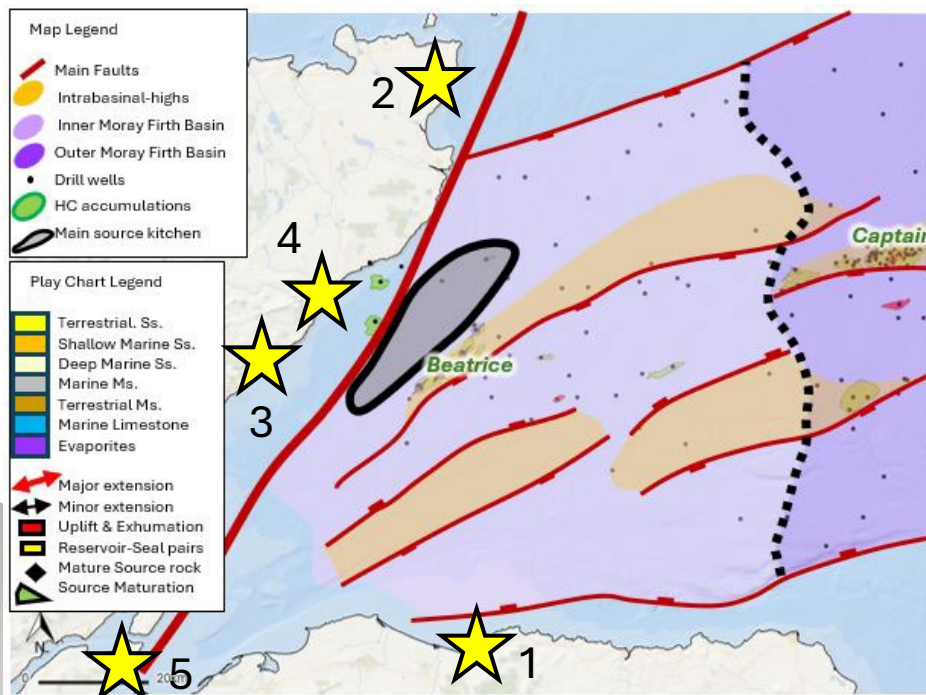


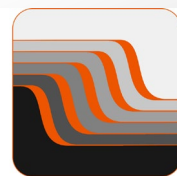
Mr Christopher Oswalt: Chris has over two decades of experience in outdoor education and wilderness risk management. For six years, he served as the Global Field Safety Director for Nautilus where he trained field staff, audited courses in the field, and oversaw complex safety protocols and operations for a portfolio of field courses worldwide. In 2019, he left Nautilus to launch his own company, Geology Field School, dedicating himself to running the highest quality field courses possible.



Play, Prospect and Field evaluation, assessment and risking: Moray Firth Basin, NE Scotland

This field seminar is designed for geoscientists involved in stewarding and upgrading a portfolio of assessed and risked opportunities across plays, prospects and fields. The course can be tailored to discuss any type of portfolio that requires subsurface assessment and risking of parameters, being oil & gas, CCS or hydrogen storage. The focus is on developing a genetic tie from play to prospect to field and to integrate outcrop observations with subsurface data (cores, logs, seismic) of the Moray Firth Basin, Scotland. We will cover aspects of basin evolution, tectonic domains, structural styles and reservoir, seal and source aspects of all clastic depositional systems. We will make comparisons to global basin and petroleum systems and prolific plays, prospects and fields.





Play, Prospect and Field evaluation, assessment and risking: **Moray Firth Basin, NE Scotland**

COURSE CONTENT

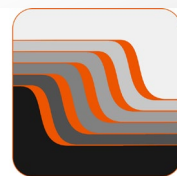
- Play evaluation workflows
- Sedimentology and Stratigraphy of all clastic depositional environments, and implications for source, seal and reservoir aspects.
- Integrating outcrop information with core, well logs and seismic data.
- Impact of faulting and fracturing on fluid flow and seal
- Seal risking workflows for structural traps, stratigraphic traps and CCS.
- Workflows for seismic mapping and reservoir characterization
- Applications to Prospect risking and maturation processes.

LEARNING OUTCOMES

- Define key tectonic domains and events of a basin and describe the key genetic tectonostratigraphic units and boundaries.
- Perform well analyses to evaluate aspects of past exploration, identify well success and failure mechanisms and use this to base rate risk factors.
- Define source, seal and reservoirs of Terrestrial depositional systems.
- Define source, seal and reservoirs of Paralic clastic depositional systems.
- Define source, seal and reservoirs of Deepwater clastic depositional systems.
- Integrate outcrop, core, well log and seismic data to develop risking workflows for charge, retention and reservoir.
- Analog comparison to similar play and basin types across the globe.

Module 1: Basin Setting and Architecture	Module 2: Terrestrial Depositional Settings	Module 3: Paralic clastic depositional settings	Module 4: Deep-water clastic depositional settings	Module 5: Sediment mobilization and injection
Structural styles and basin architecture using Permo-Triassic exposures along the Moray Coast	Basin setting and facies types of terrestrial settings using Devonian outcrops in the far North of Scotland.	Reservoir, source and seal aspects of paralic clastic settings using outcrops around the Brora-Helmsdale area.	Reservoir, source and seal aspects of deep-water clastic settings using outcrops around the Brora-Helmsdale area.	Specific focus on sand mobilization and injection process relevant to N Sea and global play types using classic outcrops on the Black Isle.

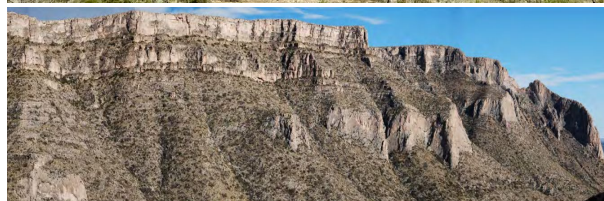
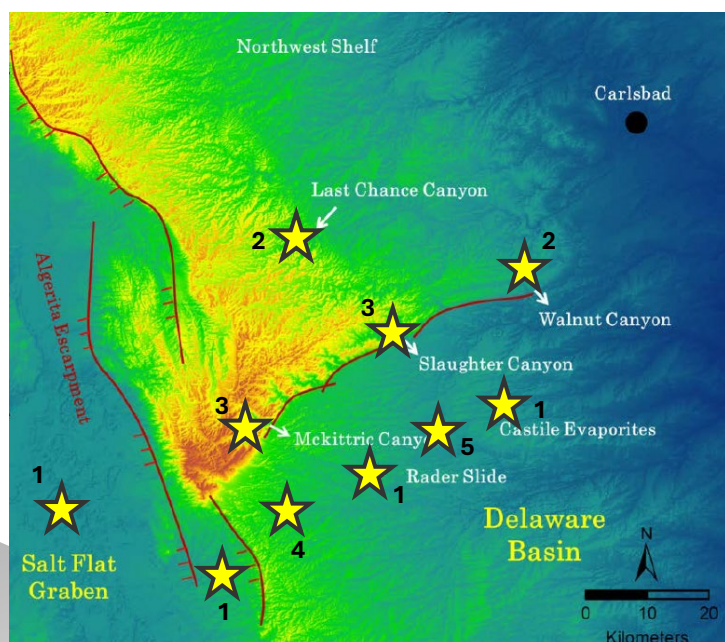




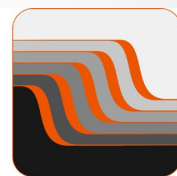
ACT GEO

Play, Prospect and Field evaluation, assessment and risking: **Permian Basin, W Texas & New Mexico**

This field seminar is designed for geoscientists and engineers exploring and developing plays in mixed carbonate-siliciclastic shallow-water and deep-water systems including conventional and unconventional plays. Participants will improve their abilities to distinguish depositional facies and play elements based on seismic features, stratal geometries, sequence stratigraphy, diagenetic changes impacting reservoir quality, and depositional models. Core, well logs, and seismic data from the Permian Basin is used to establish a sequence stratigraphic framework and to emphasize the prediction, presence, and quality of play elements for conventional and unconventional systems.



GEOLOGY FIELD SCHOOL



Play, Prospect and Field evaluation, assessment and risking: **Permian Basin, W Texas & New Mexico**

COURSE CONTENT

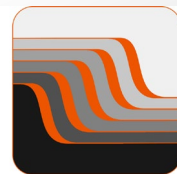
- Permian Basin geologic overview and the petroleum system
- Sedimentology of mixed carbonate-clastic depositional systems
- Fundamentals of diagenesis across reservoir types and how diagenetic changes impact reservoir quality
- Depositional facies and play elements in mixed systems
- Outcrop examples of seismic-scale geologic features, stratal geometries, and sequence stratigraphic frameworks
- Unconventional petroleum systems at play and well-bore scale

LEARNING OUTCOMES

- Analyze outcrops of carbonate shelf and siliciclastic basinal systems
- Relate depositional facies from outcrop to seismic-scale geometries within an overall sequence stratigraphy framework
- Establish similarities between world-class outcrop exposures to productive intervals in the Permian Basin
- Understand how diagenesis affects reservoir porosity and permeability
- Assess carbonate depositional and reservoir facies.
- Apply chronostratigraphic principles in core, log and seismic interpretation, and relate these to productive intervals for unconventional resources.

Module 1: Basin Setting and Architecture	Module 2: Shallow-water mixed systems	Module 3: Carbonate Platform and Slope settings	Module 4: Deep-water clastic depositional settings	Module 5: Unconventional petroleum systems
Basin architecture and broad overview of stratigraphy and facies encountered.	Detailed investigation of outcrops and drone models of the Last Chance Canyon area	Detailed investigation of outcrops and drone models of the McKittrich and Slaughter Canyon areas.	Detailed investigation of outcrops and drone models of the Guadalupe Canyon area.	Discussion of subsurface unconventional systems using distal outcrops.





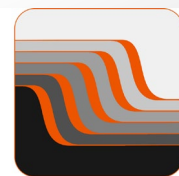
ACT GEO

Updip-to-downdip play element prediction and linkage: Western Interior Seaway, Southern Utah

This field course integrates outcrops over the Cenomanian-Turonian age range across the entire western interior seaway using outcrop and core information. Using the sequence stratigraphic method, integrated with biostratigraphic data, we will trace updip fluvial to mid-dip clastic marine sand and shale successions and ultimately into downdip organic and biogenic rich facies using research boreholes. This course teaches students how to make play element predictions and linkages across plays and prospects within shallow-water epeiric seaways, including conventional and unconventional petroleum systems.



GEOLOGY FIELD SCHOOL



Updip-to-downdip play element prediction and linkage: **Western Interior Seaway, Southern Utah**

COURSE CONTENT

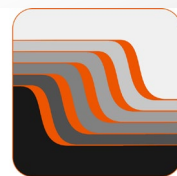
- overview of the western interior seaway in the cretaceous and application to multiple petroleum basins in Utah, Colorado and Wyoming.
- Review classic fluvial and shallow marine facies, strata, and parasequence architecture in outcrop and well log data.
- Understand how depositional environments from proximal to distal locations vary and make play element predictions at the basin-scale.
- Mudstone seal, source rock and unconventional reservoir attributes as a function of depositional setting.

LEARNING OUTCOMES

- Historical overview of geologic investigations conducted on the world-class rock exposures in the Grand Staircase of Utah.
- Review classic fluvial to shallow marine clastic depositional systems of the Cretaceous Western Interior Seaway
- Conduct a transect of rock exposures that broadly follow a regional depositional dip trend of proximal to distal depositional environments
- Understand controls on source rock and unconventional reservoir deposition and diagenesis across a classic time interval (Ceno-Turonian).

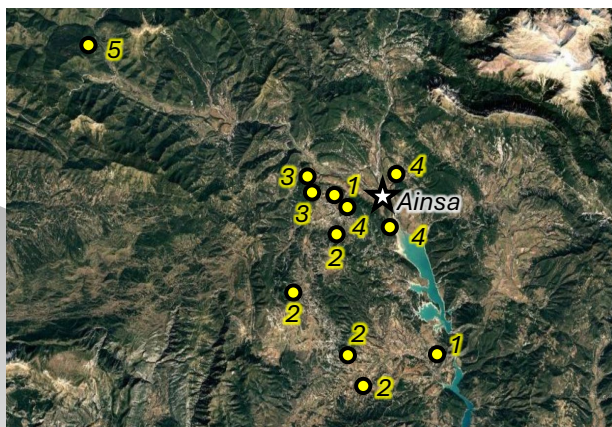
Module 1: Fluvial depositional setting	Module 2: Shallow-water depositional setting	Module 3: Detrital mud-prone depositional setting	Module 4: Organic and biogenic-rich depositional setting	Module 5: Basin Scale Architecture
Investigate outcrops around Cedar City and Big Hill and Maple Canyon.	Investigate outcrops around Cedar Canyon and North Fork.	Investigate outcrops around Paria River and Big Water.	Investigate outcrops around Sit Down Bench and Croton Canyon.	Using biostratigraphic data and research boreholes, integrate outcrops along an entire basin transect.





Updip-to-downdip play element prediction and linkage: Tresp-Ainsa-Jaca Basins, Spain

Well-exposed rock exposures of the Pyrenean Foreland Basins (PFB) in northern Spain offer unique opportunities to observe a fully linked updip fluvial to shallow marine, deep-water slope and basin floor system. This 5-day course combines field activities with in-class lectures and exercises. Field exercises focus on lithofacies descriptions, stratal geometries, and the practical applications for recognizing key stratigraphic surfaces. Participants learn to describe core and to integrate core and well-log information with seismic to generate high-resolution play maps. Engineering data is utilized to emphasize how this type of information can improve the prediction of reservoirs and their performance. All outcrops are accompanied by drone-acquired photogrammetry models to observe various scales.





Updip-to-downdip play element prediction and linkage: **Tremp-Ainsa-Jaca Basins, Spain**

COURSE CONTENT

- Interpret fluvial, shallow marine and deep-water depositional environments.
- Interpret sequence stratigraphic surfaces in outcrop, logs, and seismic and correlate them within a predictive framework across the basin.
- Use outcrop, core and well-logs to interpret reservoir facies.
- Evaluate reservoir geometry and connectivity in various DW settings.
- Interpretation and mapping techniques for core, well-logs, and seismic lines in DW settings from exploration to production scales.
- Play fairway identification and mapping.

LEARNING OUTCOMES

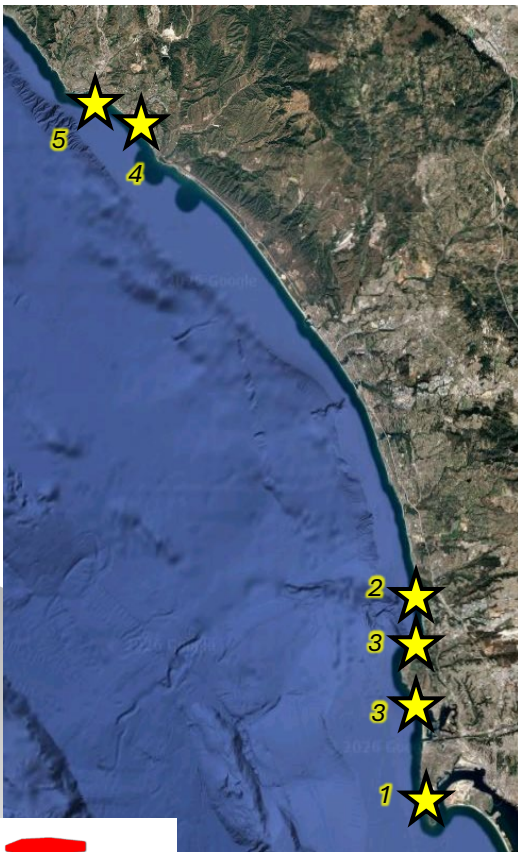
- Sedimentological processes and lithofacies in various depositional systems.
- Reservoir architecture, N/G and connectivity at various scales.
- Deep-water lithofacies nomenclature and definitions.
- Identify key stratigraphic surfaces based on changes in stacking patterns. Utilize outcrop analogues and depositional models to better understand 3-D distribution of reservoir facies.
- Correlate rock properties to facies and build geologic models.
- Understand quantitative rock physics responses of various reservoir types.

Module 1: Basin Setting	Module 2: Fluvial and Shallow Marine Setting	Module 3: Confined deep-water setting	Module 4: Distributive deep-water setting	Module 5: Distributive deep-water setting
Investigate viewpoints of the Mediano and Boltana anticlines.	Investigate outcrops around Mondot and Buil.	Investigate outcrops of the Morill Formation around Boltana.	Investigate outcrops at Ainsa Quarry, O'Grau riverwalk and Ainsa town viewpoint.	Investigate outcrops along the road to Bergua.



Deep-water depositional systems: reservoir and retention styles **San Diego, California**

This course combines field activities with in-class lectures and exercises. Six deep water systems will be examined in this field course. Exercises in the field will focus on description of DW lithofacies, stratal geometries and recognizing key stratigraphic surfaces, emphasizing practical applications. Participants will also learn to describe cores, integrate core and well-log information with seismic to generate high-resolution EoD maps of reservoirs in different settings. Engineering data is used to demonstrate how to improve prediction of reservoir performance. Photogrammetry models, cores, well-logs and seismic examples are compared to outcrops to help participants extrapolate 2D outcrop information to 3-D reservoir scale depositional systems.



Deep-water depositional systems: reservoir and retention styles **San Diego, California**

COURSE CONTENT

- Review deep water lithofacies nomenclature and definitions, common lithofacies associations, and interpret outcrops and cores
- Use core and well-logs to interpret EoDs
- Evaluate reservoir geometry and connectivity across different EoDs
- Use outcrop information as analog for reservoir model building
- Evaluate exploration to production scale interpretation and mapping techniques for core, well log, and seismic lines across DW settings
- Recognition criteria and mapping strategies for play elements in DW depositional settings

LEARNING OUTCOMES

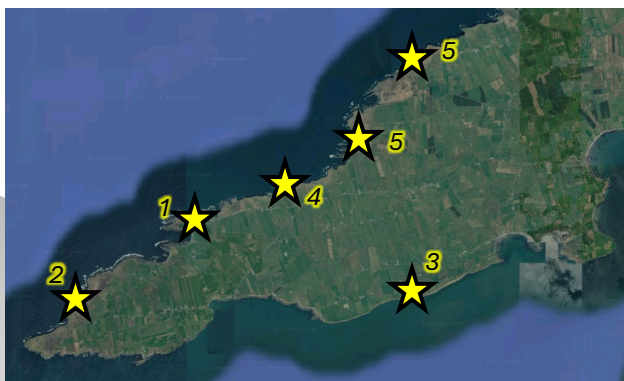
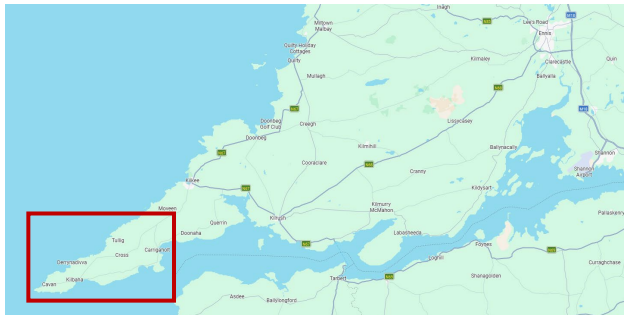
- Understand sedimentological processes associated with deep-water (DW) deposition and their impact to reservoir architectures
- Review and recall DW lithofacies nomenclature and definitions
- Describe DW lithofacies in core and relate them to stratal geometries.
- Interpret key stratigraphic surfaces based on changes in lithofacies stacking and associations
- Utilize outcrop analogues and depositional models to better understand 3-D distribution of reservoir facies
- Correlate rock properties to facies and build geologic models
- Use core, log and seismic data to describe 3D reservoir architecture

Module 1: DW Distributive Systems	Module 2: DW Confined Systems	Module 3: Lower N/G parts of DW systems	Module 4: Weakly Confined DW Systems	Module 5: Slope Environments and Synthesis
Investigate Cretaceous outcrops around Point Loma	Investigate Eocene outcrops around Blacks's Beach.	Investigate Cretaceous and Eocene outcrops around Tourmaline beach/La Jolla cove.	Investigate Miocene outcrops around San Clemente beach.	Investigate outcrops at Dana Point.



Deep-water depositional systems: reservoir and retention styles **County Clare, Ireland**

The Ross Formation (Fm) in Ireland offers a unique opportunity to observe seismic-scale outcrops of a deep-water system with characteristics like several producing basins (e.g., West Africa, offshore Brazil, Gulf of Mexico, North Sea). This course combines field activities with in-class lectures and exercises about deep-water fan systems. Applied field exercises focus on DW lithofacies descriptions and the recognition of key stratigraphic surfaces. Additionally, participants learn how to integrate engineering and production data to improve prediction of reservoir performance. Core, well-logs and seismic examples are compared and contrasted with outcrop data to help participants extrapolate 2-D outcrop information into 3-D views of depositional systems.



Deep-water depositional systems: reservoir and retention styles **County Clare, Ireland**

COURSE CONTENT

- Review deep water lithofacies nomenclature and definitions, common lithofacies associations, and interpret outcrops and cores
- Use core and well-logs to interpret EoDs
- Evaluate reservoir geometry and connectivity across different EoDs
- Use outcrop information as analog for reservoir model building
- Evaluate exploration to production scale interpretation and mapping techniques for core, well log, and seismic lines across DW settings
- Recognition criteria and mapping strategies for play elements in DW depositional settings

LEARNING OUTCOMES

- Understand sedimentological processes associated with deep-water (DW) deposition and their impact to reservoir architectures
- Review and recall DW lithofacies nomenclature and definitions
- Describe DW lithofacies in core and relate them to stratal geometries.
- Interpret key stratigraphic surfaces based on changes in lithofacies stacking and associations
- Utilize outcrop analogues and depositional models to better understand 3-D distribution of reservoir facies
- Correlate rock properties to facies and build geologic models
- Use core, log and seismic data to describe 3D reservoir architecture

Module 1: DW Lithofacies calibration	Module 2: Large-scale stacking patterns	Module 3: Continuity of distributive systems	Module 4: Fine-scale channel and lobe architecture	Module 5: Slope Environments
Investigate lithofacies and stacking around Ross Bay, Bridges of Ross,	Investigate outcrops around Loophead Lighthouse.	Investigate models and (from boat) observe Kilchoher, Kilcedraun Cliffs.	Investigate Torkealand Fisherman's point outcrops.	Investigate Gull Island slope facies and incised valley fill (Trusklieve)

