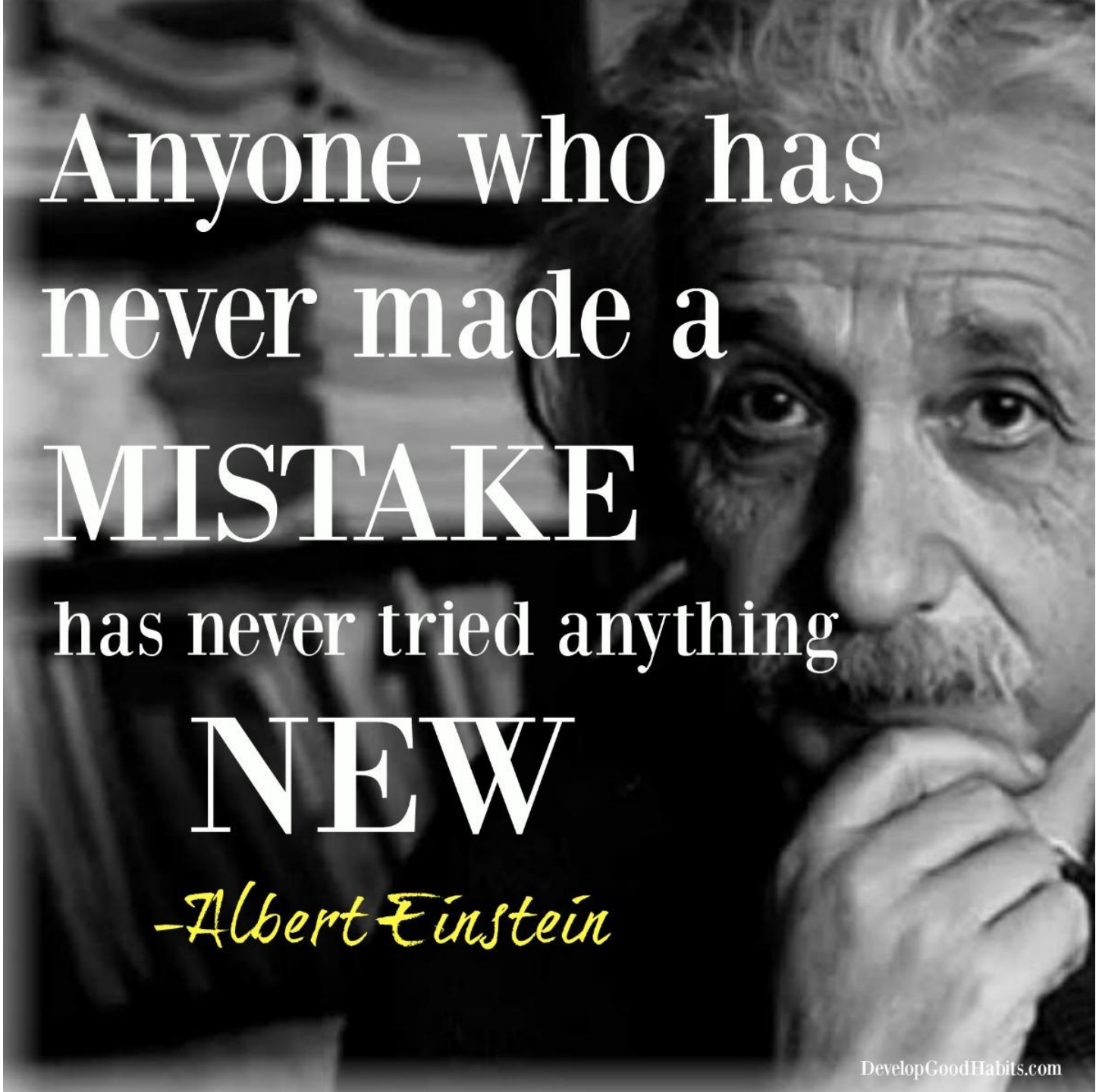
# "Орчин үеийн судалгааны шинэ арга зүйг эзэмших арга, техникүүд: Геоморфологийн Шинжлэх Ухааны жишээн дээр"

**МУИС-ийн ШУС-ийн БУС**

**А.Орхонсэлэнгэ (Ph.D)**

**МУИС-ийн Эрдмийн Танхим**

**2018.05.09**


Anyone who has never made a MISTAKE has never tried anything NEW
-Albert Einstein
DevelopGoodHabits.com

## The Sections of the Paper

Most journal-style scientific papers are subdivided into the following sections: Title, Authors and Affiliation, Abstract, Introduction, Methods, Results, Discussion, Acknowledgments, and Literature Cited, which parallel the experimental process. This is the system we will use. This website describes the style, content, and format associated with each section.

The sections appear in a journal style paper in the following prescribed order:

| Experimental process | Section of Paper |
|---|---|
| What did I do in a nutshell? | Abstract |
| What is the problem? | Introduction |
| How did I solve the problem? | Materials and Methods |
| What did I find out? | Results |
| What does it mean? | Discussion |
| Who helped me out? | Acknowledgments (optional) |
| Whose work did I refer to? | Literature Cited |
| Extra Information | Appendices (optional) |

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# "*Орчин үеийн судалгааны шинэ арга зүйг эзэмших арга, техникүүд*"

## Агуулга

- **Орчин үеийн судалгаа**
- **Судалгааны шинэ аргууд**
- **Эзэмших арга, техник**
- **Хэлэлцүүлэг: асуулт, хариулт**

# Орчин үеийн судалгаа

- **Түвшин:** **Ахисан, дэвшилтэт, нарийвчлал өндөртэй, туршлагаар баталсан, шинэ санаа дэвшүүлсэн, инновацийн чадавхитай**
- **Хэлбэр:** **Суралцагч:Сургагч 90:10**

# Судалгааны шинэ аргууд

- **Арга:** **- Онолын (theoretical or logical)**
  **- Аналитик (empirical)**
- **Технологи:** **Компьютер, NASA, Програм, ...**

# Эзэмших арга, техник

- **Мэргэжлийн ном, сурах бичиг бие даан судлах**
- **Сургалтад хамрагдах**
- **Онлайн хичээл судлах**
- **Олон Улсын мэргэжлийн хуралд оролцох**
- **Олон Улсын мэргэжлийн экспедицэд оролцох**

**Эзэмших арга, техник**

**Мэргэжлийн ном, сурах бичиг бие даан судлах**

**Wiley, Oxford, Cambridge, Springer, …**

**Шинэ онол**

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**Шинэ арга**

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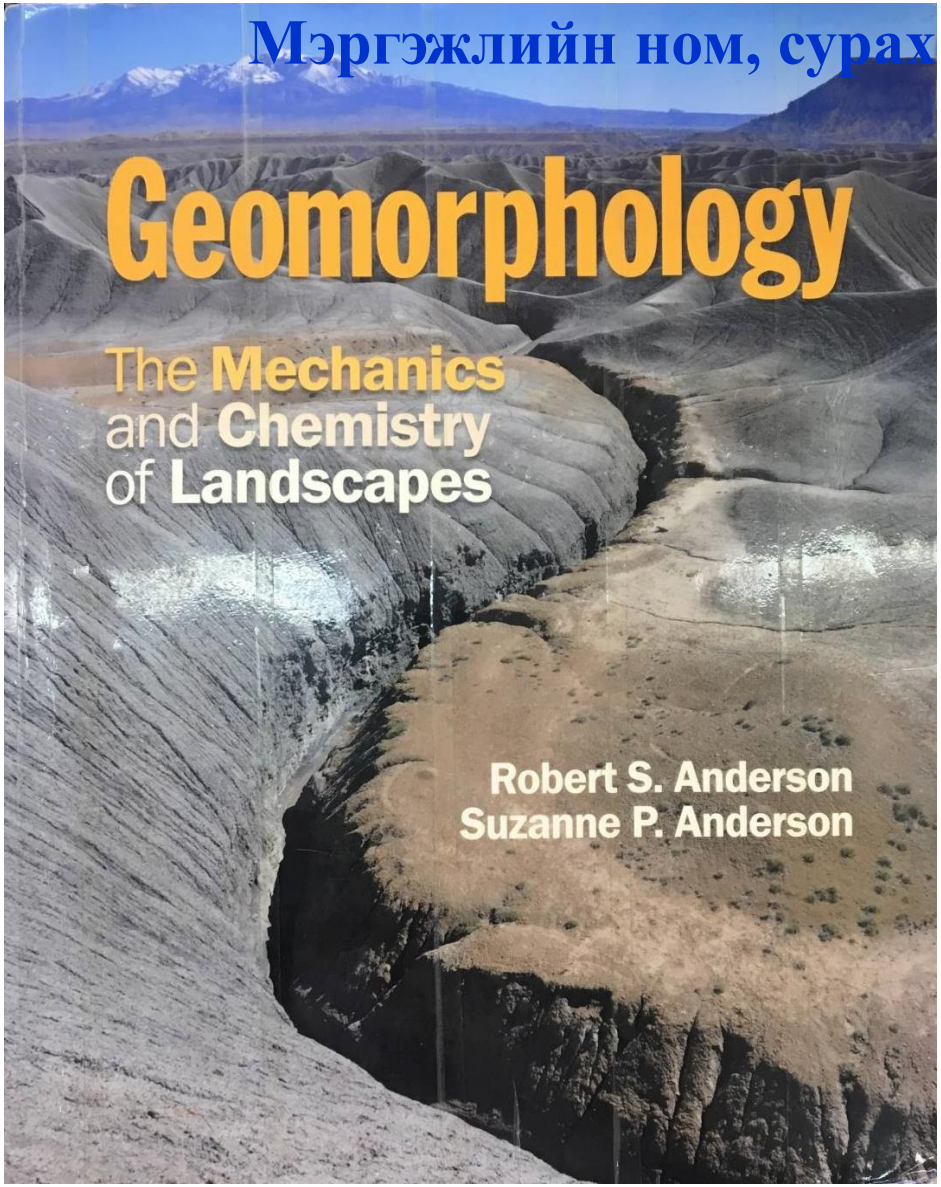


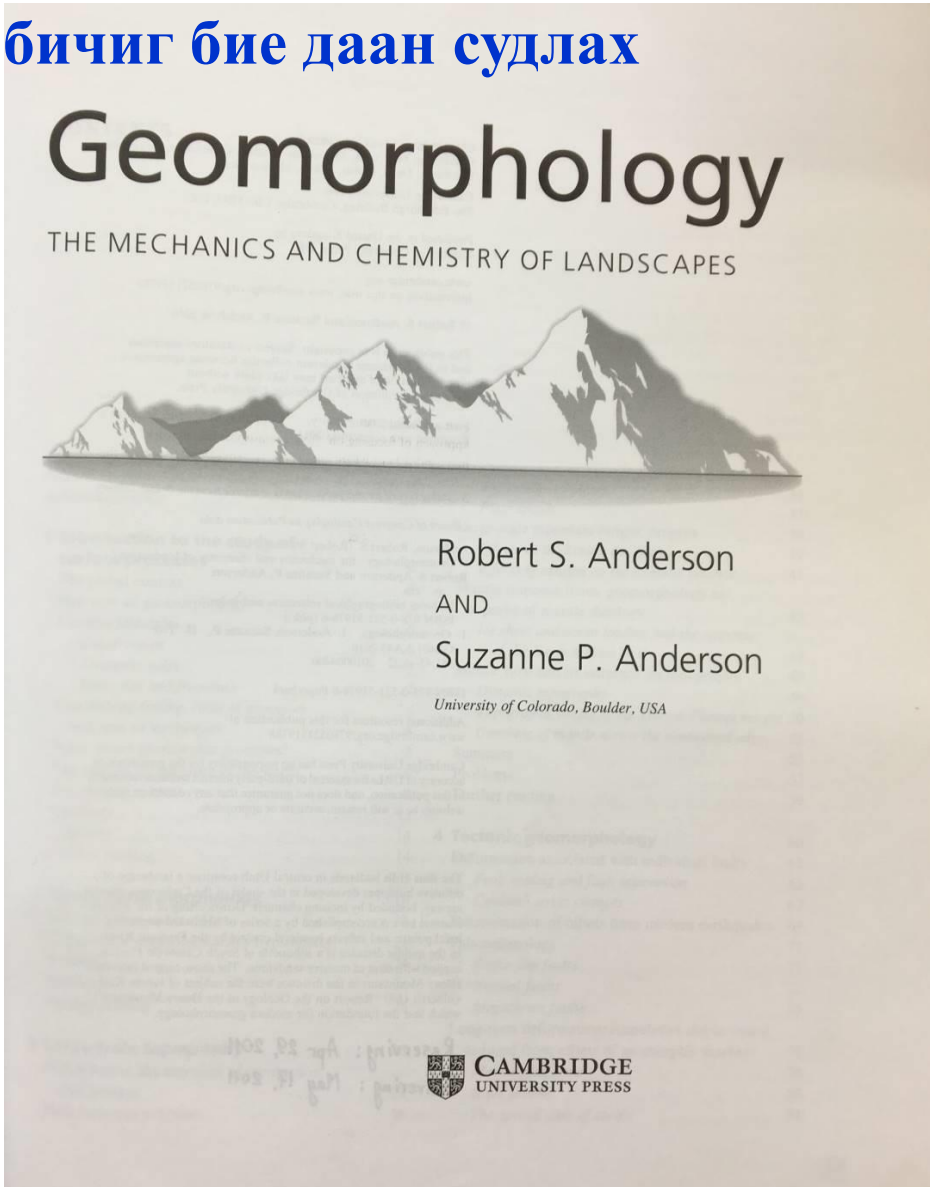

# Эзэмших арга, техник

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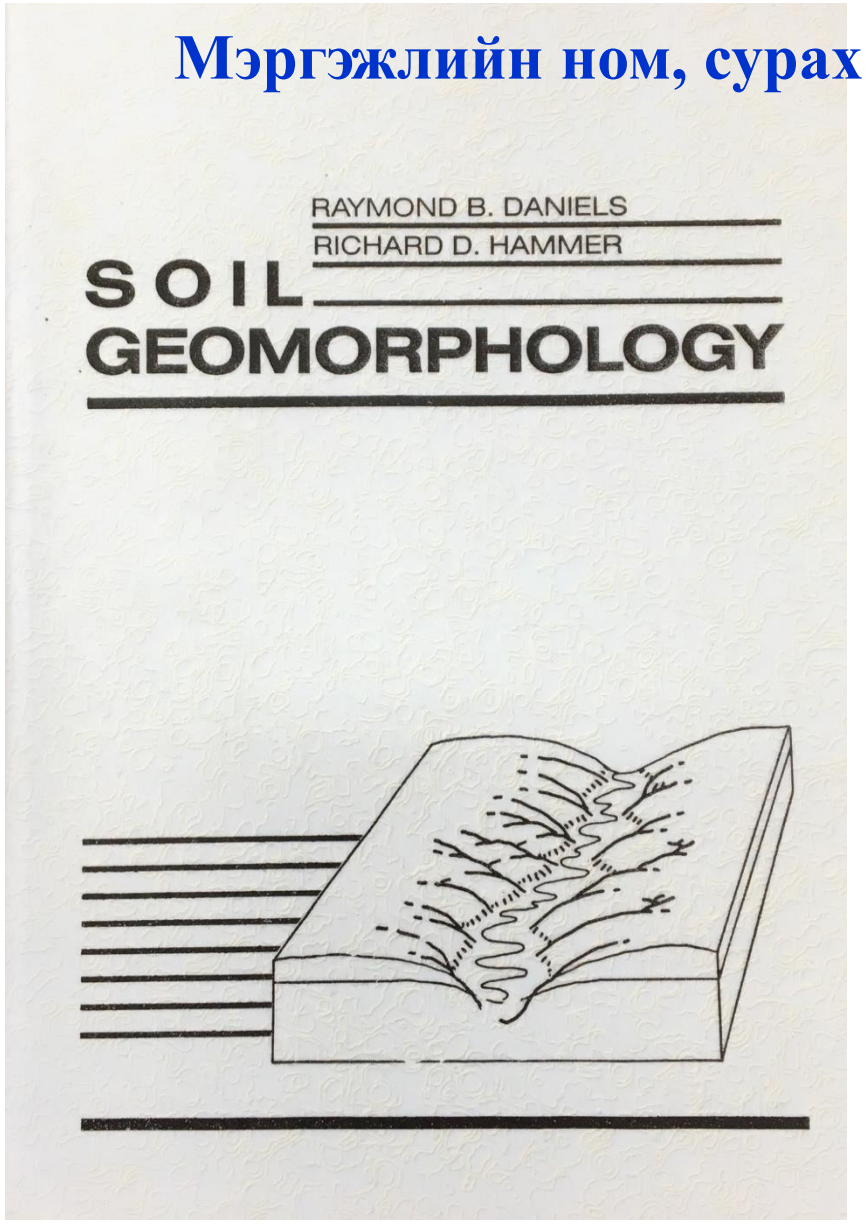


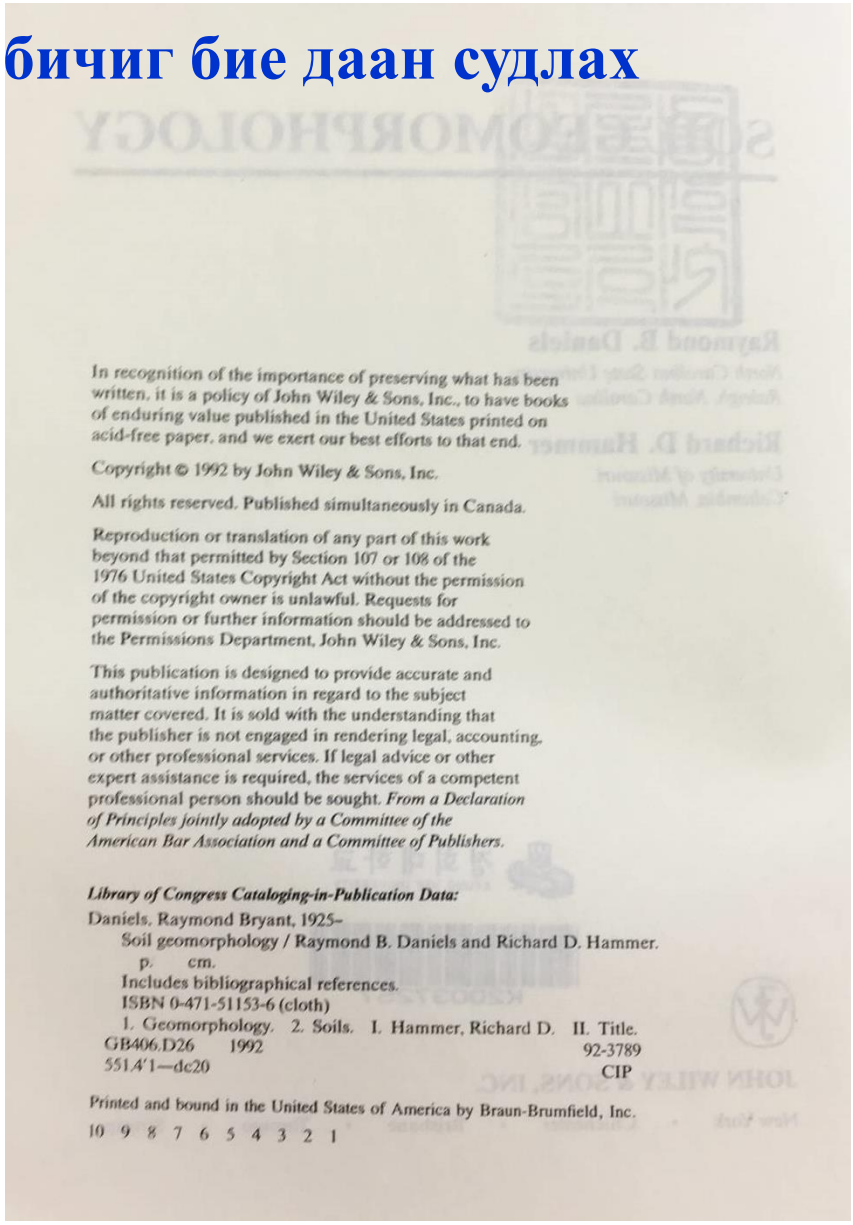

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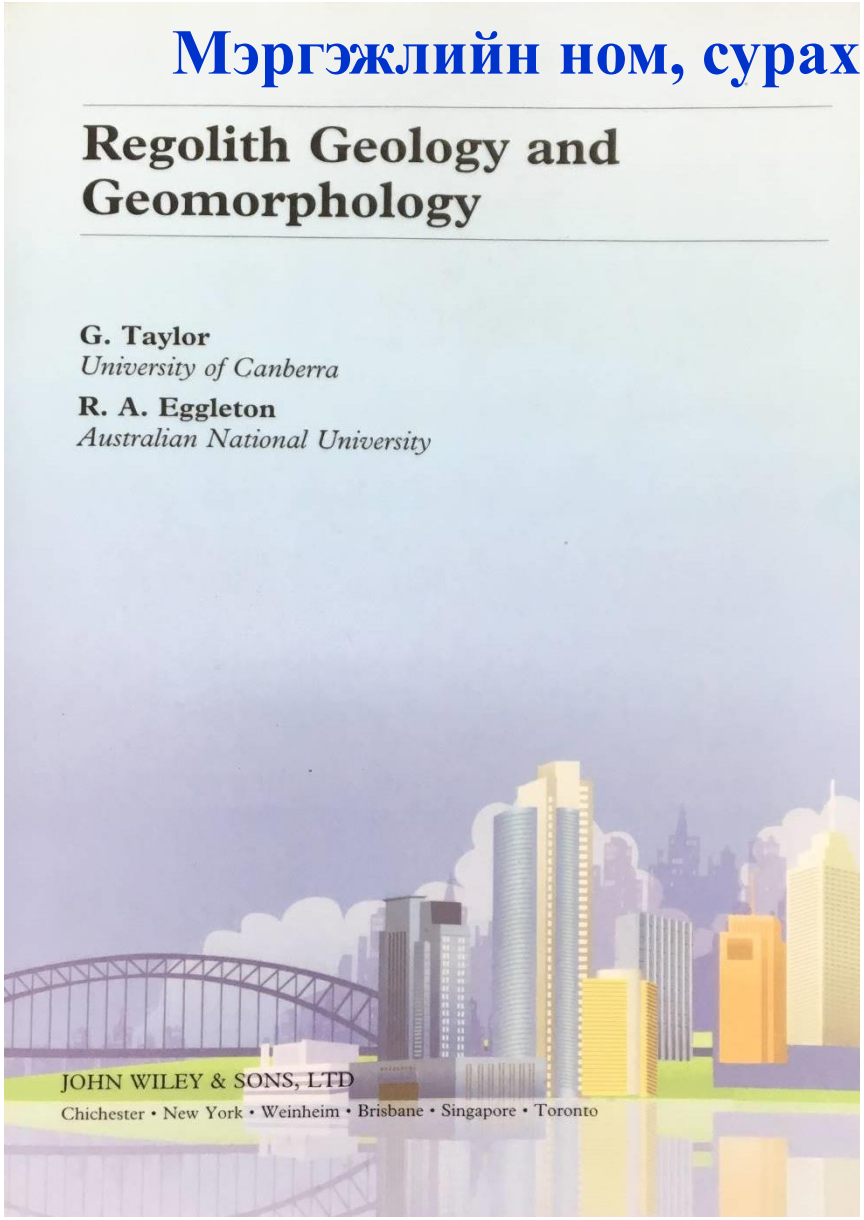

**Regolith Geology and Geomorphology**

**G. Taylor**
*University of Canberra*

**R. A. Eggleton**
*Australian National University*

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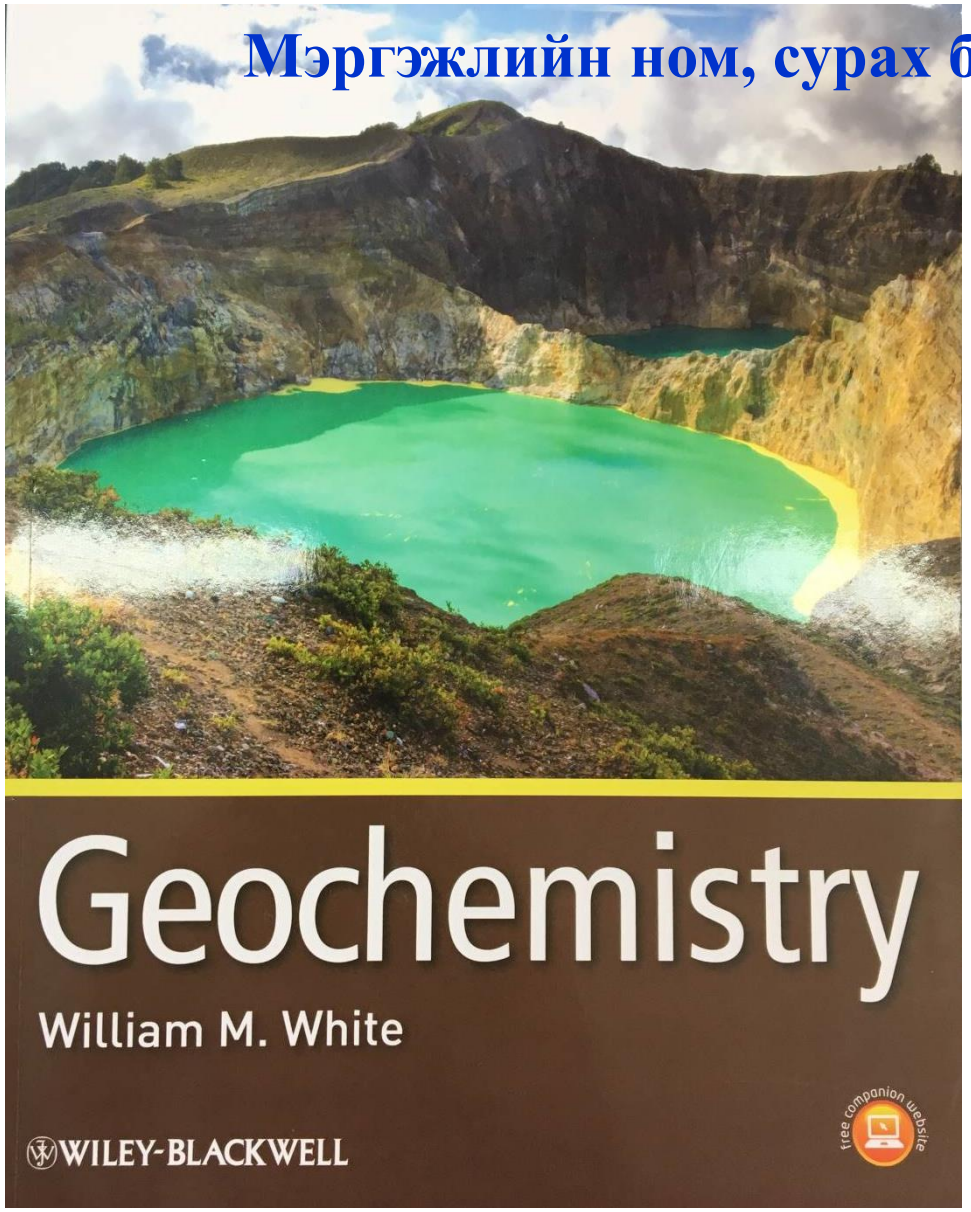


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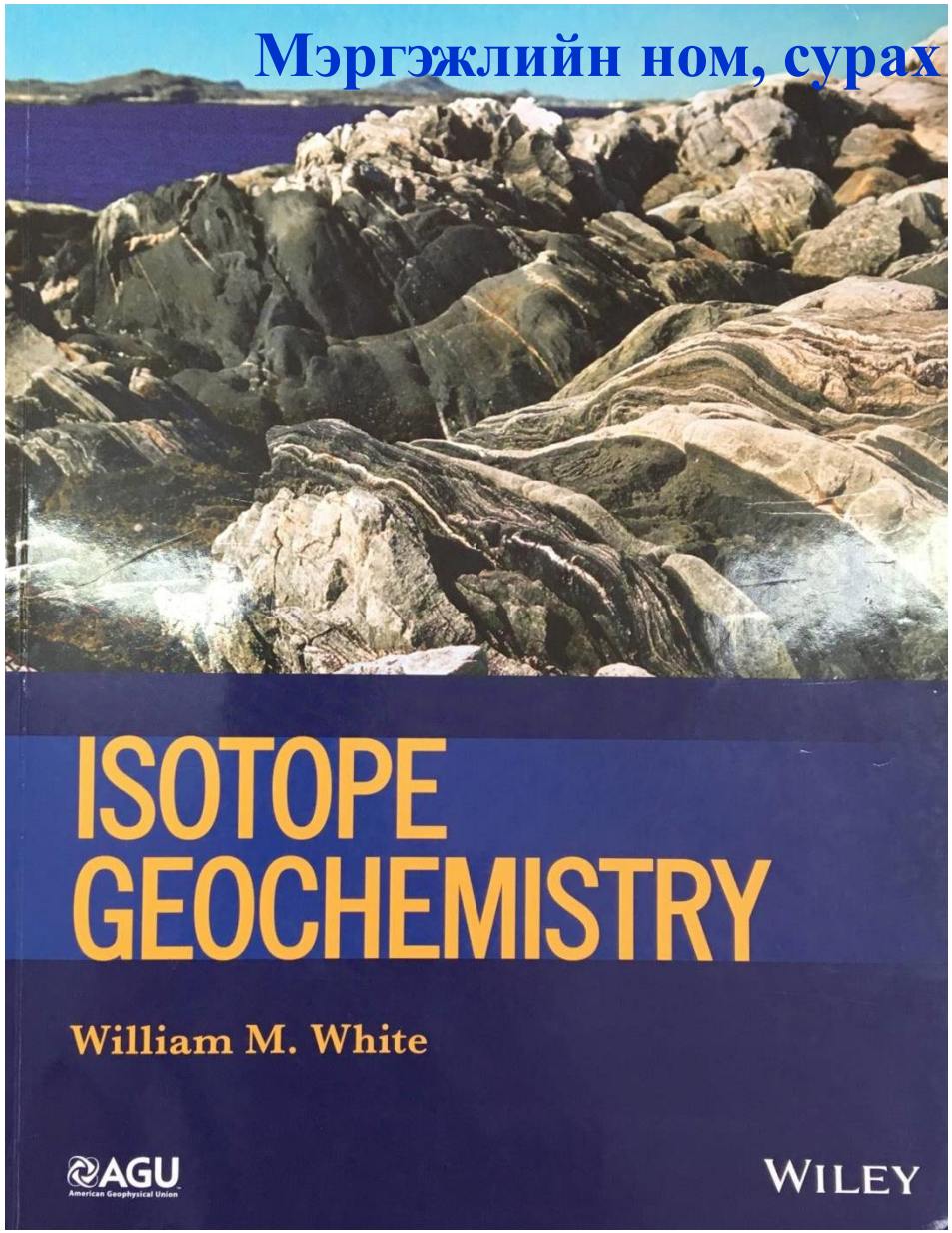


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# Эзэмших арга, техник

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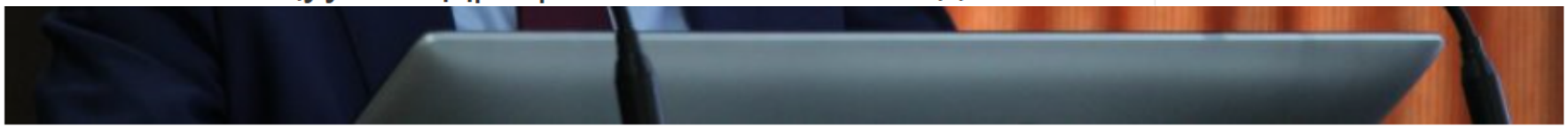
Магистрант, докторант оюутнуудад зориулсан судалгааны семинар

# Европын Холбооны ERASMUS+ хөтөлбөрийн “C3QA” төслийн зохицуулагч Др.Араик Навоян МУИС-д



Сургалт, хэлэлцүүлгийн үеэр төслийн багийнхан докторын сургалт болон зэрэг хамгаалуулах, хамгаалах талаар хийсэн судалгааны үр дүн, хэрэгжүүлж болох үйл ажиллагаа болон “Магистр, докторын сургалт эрхлэх нийтлэг журам”, “Докторын зэрэг хамгаалуулах зөвлөлийн дүрэм” –ийг шинэчлэн, докторын судалгааны ажилд тавигдах шаардлага, эрдмийн зэрэг горилогч болон удирдагч багшид тавих шалгуурыг өндөрсгөх, судалгааны ажлын чанар, бүтээл хуулбарлалтыг илрүүлэх програм хангамийг нэвтрүүлэх, үндэсний мэдээллийн сантай болох, судалгааны ёс зүйн асуудлыг тусгах, докторын зэрэг хамгаалуулах зөвлөлийн гишүүдэд тавих шалгуурыг өндөрсгөх замаар зөвлөлийг бүрэлдэхүүнийг чанаржуулах, олон улсад хүлээн зөвшөөрөгдсөн, идэвхтэй судлаачдыг зөвлөлийн гишүүнээр томилох, тэдгээрийн үйл ажиллагааны товтвортой байдлыг хангах чиглэлд анхаарч, гадаадын өндөр хөгжилтэй улсын их сургуультай хамтарсан зөвлөл байгуулах боломжийг нээн судалгааны ажлыг тал бүрээр дэмжих чиглэлд өөрчлөлтүүдийг оруулж, сургууль бүр хөтөлбөрийн дотоод чанарын баталгаажуулалтаа хариуцсан хороотой байх зэрэг олон асуудлыг шинээр тусгаж байгаа талаар илтгэл тавин хүрэлцэн ирсэн их, дээд сургуулиудын төлөөлөгчидтэй санал солилцлоо.

Өнөөдөр буюу 5 дугаар сарын 4-ний өдөр төслийн ерөнхий зохицуулагч Др. Араик Навоян БСШУСЯ-ны Төрийн нарийн бичгийн даргын үүрэг гүйцэтгэгч Л.Цэдэвсүрэнтэй уулзаж төслийн цаашдын үйл ажиллагааны талаар санал бодлоо солилцох юм.

# Эзэмших арга, техник

## Мэргэжлийн ном, сурах бичиг бие даан судлах

# Эзэмших арга, техник

- **Сургалтад хамрагдах**
- **Онлайн хичээл судлах**
- **Олон Улсын мэргэжлийн хуралд оролцох**
- **Олон Улсын мэргэжлийн экспедицэд оролцох**

# Эзэмших арга, техник

- **Онлайн хичээл судлах**

**Ач холбогдол:** **Богино хугацаанд арга зүйд суралцах**

**Холбогдох шинэ материалуудтай танилцах**

# М.Баттүшиг: Хиймэл оюун ухааны эрин үе ирж байна


*Гэрэл зургийг MPA.mn*

15 настай байхдаа Массачусетсийн Технологийн Институтын онлайн сургалтад амжилттай суралцаж, 150 мянга гаруй хүнийг шалгалтын оноогоороо тэргүүлсэн М.Баттүшигийн талаар өмнө нь бид мэдээлж байсан билээ.

“Сант” сургуулийн төгсөгч тэрбээр яг одоо MIT-ийн InfoLab-д ажиллаж, магистрын судалгааны ажлаа Artificial Intelligence /хиймэл оюун ухаан/, Machine Learning чиглэлээр хийж байна. Мөн М.Баттүшиг Apple компанийн iPhone X утасны камер хөгжүүлэлтийн багт ажиллажээ.

# Эзэмших арга, техник

- **Олон Улсын мэргэжлийн хуралд оролцох**

**AGU, EGU, INQUA, IAG, ISC, …**

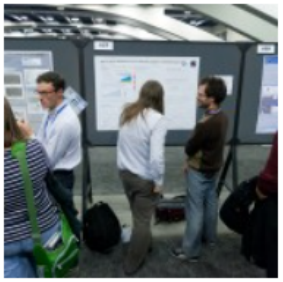
**Annually** **Every four years**

https://fallmeeting.agu.org/2018/early-career-professionals/

# Early Career Attendees

The Fall Meeting is a great way for early career professionals to make connections and build their CVs. Not only are attendees exposed to thousands of presentations filled with emerging science and new research, but they have the opportunity to attend countless events and workshops that can equip them with the right tools to build a sustainable career. Below are tips for getting the most out of your Fall Meeting experience as well as a **look at what the city has to offer**.

## Present at Fall Meeting



Presenters get constructive feedback in real time from experts and established scientists in the field; the abstract submission tool will open in June. Presenting is a great way to test-drive your research before publishing in a peer-reviewed journal. Did you know most AGU editors from all 20 AGU journals will be at AGU Fall Meeting? Make sure to visit the Journals Booth to connect with editors and learn about best practices for submitting a manuscript.

## Learn About Research in Your Field and Beyond

With more than 23,000 oral and poster presentations to choose from, the Fall Meeting scientific program is packed with cutting-edge research you don't want to miss. Take advantage of this opportunity to hear directly from your peers about their research and network with colleagues who you might want to collaborate with as you advance your career.

## Take Advantage of Early Career Workshops

Did you know that AGU Fall Meeting offers dozens of workshops specifically geared toward young professionals like you? We are still in the early stages of planning, but you can check back here later to find a list of career advice workshops, networking receptions, and communication workshops all designed to help you successfully move forward in your career.

## Book in Advance

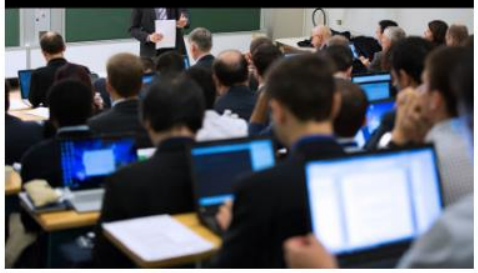
Get the early bird rate by registering in advance; the online registration tool and online housing tool will both

isc2018.org

# Welcome to IS Congress 2018 - an IAS Event

IAS Registration

Sessions



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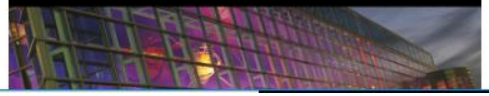

Keynote speakers

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IMPORTANT DATES

**Registration starts**
January 15, 2018

**Abstract submission deadline**
**CLOSED**

**Paper acceptance notice**
**New date** April 25, 2018

**Early bird & presenting author registration deadline**
May 14, 2018 **U.S. / Canadian Eastern Time*

# Short Courses

## Workshops

>> Early Career

## ISC 2018 Sh

### SC 1. Chemostra
### geological proble

**by Jean-Yves Chatell**

This workshop addres
individuals involved in
INRS for the non-des
workflows directly usal

**Date:** Sunday, August
**Number of participar**
**Cost**: $ 200 CAD

### SC 2. Grain size

**by Elisabeth Dietze (**

The short course will t
source programming e
depositional system ir
depositional processes
learning how to handl
evaluate the model ou

**Date:** Sunday, August
**Time**: 9:00 am - 12:30

## Early Career Scientist Workshops

### ECS WS 2. How to write a Research Proposal

**Organized by IAS early-career committee**

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Using Different Imaging Techn

Dr. Kitty L Milliken, Bureau of Economic Geology, University of Texas at Austin

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Quantifying Mechanisms of Porosity Decline in Mudrocks

Dr. Benoit Beauchamp, Department

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The Sverdrup Basin of Arctic C

Professor J (Jai) PM Syvitski, Community Surface Dynamics Modeling System, University of Colorado

Bio Website Abstract

The Anthropocene — from Concept, to Geological Epoch, to 21st Century Science


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**EGU2016: Annually in Vienna, Austria**


# EGU2016: Annually in Vienna, Austria

Geophysical Research Abstracts
Vol. 18, EGU2016-5666-2, 2016
EGU General Assembly 2016
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## Sedimentary Feature in Lake Terkhiin Tsagaan and Lake Ugii, Central Mongolia

Alexander Orkhonselenge (1) and Tuyagerel Davaagatan (2)
(1) Department of Geography, School of Arts and Sciences, National University of Mongolia, Ulaanbaatar 15160, Mongolia (rkhnslng@num.edu.mn), (2) Institute of Geography, Mongolian Academy of Sciences, Ulaanbaatar 210646, Mongolia

We present characteristics of lacustrine sediments recorded from Lake Terkhiin Tsagaan and Lake Ugii at near latitudes in Central Mongolia. Physical-chemical properties of eight core sediments collected from these lakes show impact of different montane and prairie landscapes on the lacustrine sediments. Lake Terkhiin Tsagaan indicating a montane landscape with higher contents of organic matter and biogenic silica, and finer sediments differs from Lake Ugii reflecting a prairie landscape with higher contents of carbonates and minerals, and coarser sediments. Stratigraphical sequences of the lacustrine sediments recommend that these two lakes have experienced a numerous of environmental conditions during the arid mid Holocene and humid late Holocene reconstructed from the adjacent lakes in Central Mongolia. These Holocene climatic changes inferred from dramatic fluctuations in temperature and precipitation might have been responsible for the identical environmental conditions, resulting in the sedimentary feature in Lake Terkhiin Tsagaan and Lake Ugii. More investigations with precise dating are thus needed from the both lakes for determining lacustrine sedimentations and reconstructing paleoenvironmental changes in Central Mongolia.

**MSc. T.Davaagatan**

# Эзэмших арга, техник

- **Олон Улсын мэргэжлийн хуралд оролцох**

**Ач холбогдол:**

**Шинэ арга зүйтэй танилцах**

**ЭШ-ний ажлын арга зүйд суралцах**

**ОУ-ын эрдэмтэдтэй холбоо тогтоох**

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# ЭШ-ний ажлын арга зүйд суралцах

The abstract's presentation number: 2
Title: Intensity of soil erosion and sedimentation inferred from spatial distribution of radionuclide 137Cs in hill slope catchments, South Korea , *Sediment Dynamics in Changing Environments (Red Book. IAHS* Publ. 325, 2008, 130-134

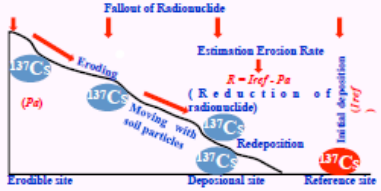
## Estimating the Soil Erosion on Hill Slopes in Korea using Radionuclide 137Cs

**Orkhonselenge. A[1*], K. Kashiwaya [2] and Y.K. Kim[3]**

[1] *Institute of Geography, Mongolian Academy of Sciences, Ulaanbaatar 210-620, Mongolia, E-mail: alorsel@gmail.com*
[2] *Institute of Nature & Environmental Technology, Kanazawa University, Kakuma 920-1192, Japan, kashi@kenroku.kanazawa-u.ac.jp*
[3] *Korean Department of Nuclear Engineering, Hanyang University, Seoul 133-791, Korea, ykkim4@hanyang.ac.kr*

### BACKGROUND

Due to its geomorphology, mountainous landscape and climate, heavy rainfall conditions have been the major source of intensive soil erosion by storm water in Korea. Large amounts of soil masses are intensively affected by heavy rainfall events. To date, research of soil erosion in Korea has been focused on only cultivated fields (Park, 2002; Lee et al, 2004; Hur *et al.*, 2005). Several studies have indicated the average concentration of radionuclide $^{137}Cs$ within Korean soil. However, to date, any estimation of soil erosion has not been related to the radionuclide $^{137}Cs$. This study represents the first effort at estimation of soil erosion by water in Korea using radionuclide $^{137}Cs$ (Orkhonselenge et al, 2006).




### MATERIALS AND METHODS

#### STUDY AREAS


Fig 1. Location of Studied Areas

**Uijongbu (A)**
Geology: Jurassic Granite (Gr)
Mean annual precipitation: 1100 mm
Vegetation: Deciduous and Broad Leaved Tree
Soil: Entisol , Arenosol

**Yangsuri (B)**
Geology: Pre-Cambrian Gneiss (Gn)
Mean annual precipitation: 1200 mm
Vegetation: Deciduous and Broad Leaved Tree
Soil: Vertisol , Alfisol

**Yeongcheon (C)**
Geology: Cretaceous Sedimentary (Se)
Mean annual precipitation: 1000 mm
Vegetation: Deciduous and Broad Leaved Tree
Soil: Acrisol, Cambisol

#### SAMPLING AND ANALYSIS

**Field sampling**

**Bulk and Core Samples:** 10 cm and 30 cm depths along slope-transects in each catchment

(Undisturbed soils on the reference sites with no evidence of erosion and deposition, and disturbed soils on each different landforms)

**Sample preparation**
- Oven-dried (105°C, 24 h)
- Sieved (<2 mm mesh)
- Sampled with A Steel Core Tube (5 cm diameter)
- Sliced with 2 cm interval

**Measuring Radionuclide $^{137}Cs$**

| Nuclide data | |
|---|---|
| Nuclear transformation | $^{0}_{0}n$ (artificial element) |
| Half life | about 30.1 years |
| Specific activity | 3.215 TBq/g |
| Decay mode | Decay energy |
| beta, gamma | 0.605 MeV |

Table 1. Cs-137 is a radioactive isotope of caesium which is formed mainly as a fission product by nuclear fission.

HPGe-Gamma detector

Counting γ-emission: 7200 sec, Photo peak of 662 keV, Marinnell Beaker, KAERI

### RESULTS AND DISCUSSION

Table 2. Baseline inventories of $^{137}Cs$ within soil in Korea

| Location area | Baseline | Authors | Year |
|---|---|---|---|
| Granite | 48.1 Bq/kg | Choi et al | 1994 |
| Tuff | 775.0 Bq/kg | Choi et al | 1994 |
| Daejon | 14.37 Bq/kg | Lee et al | 1995 |
| Forest | 2501 Bq/m² | Lee, et al | 1998 |
| Hills | 1058 Bq/m² | Lee, et al | 1998 |
| Paddy field | 17.7 Bq/kg | Choi et al | 1999 |
| Upland field | 27.8 Bq/kg | Choi et al | 1999 |
| Granite (Uijongbu) | 2100 Bq/m² | This study | 2005 |
| Granite (Sinwonkang) | 2222 Bq/m² | This study | 2005 |
| Granite (Yangsuri) | 2040 Bq/m² | This study | 2005 |
| Sedimentary (Yeongcheon) | 1666 Bq/m² | This study | 2005 |

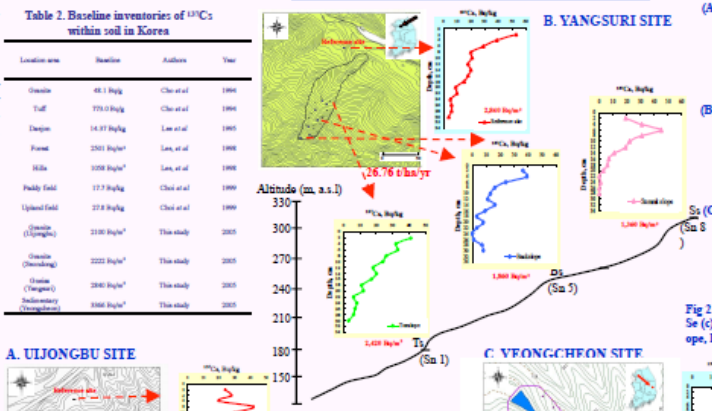



Fig 3. Vertical variability of $^{137}Cs$ inventory for the core samples along the hill slopes in the granite (a), gneiss (b) and sedimentary (c) catchments

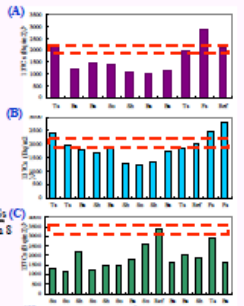


Fig 2. $^{137}Cs$ inventory(Bq/m²) in Gr (a), Gn (b) and Se (c) catchments (Su-summit slope, Sh-shoulder slope, Bs-backslope, Fs-Footslope and Ts-toeslope)

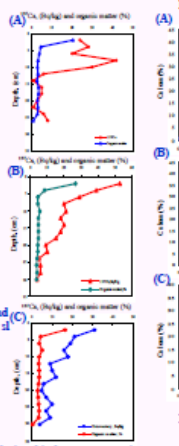


Fig 6. Relationship between organic matter content and $^{137}Cs$ inventory in core samples in the catchments

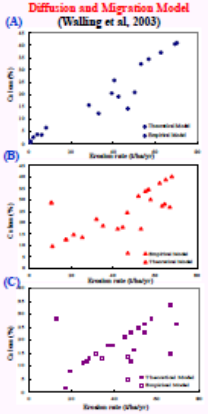



Fig 8. The erosion rates inferred from Profile distribution model

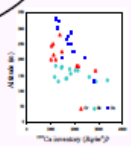


Fig 4. Relationship between the $^{137}Cs$ inventory and altitude

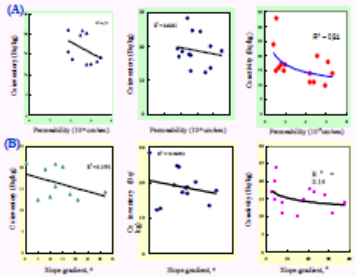


Fig 5. Relationship between soil permeability (a) slope (b) and $^{137}Cs$ inventory in the bulk samples within catchments

#### ESTIMATING EROSION RATE

Walling and Quine, 1990; Zhang, *et al.*, 1990

$Y = 10(0.1963\ln(1-X/100))kt$

*Y* - Erosion Rate (t/ha/yr); *t* - year of sample collection (yr); *X* - the percentage reduction in the reference inventory when it is assumed that the total $^{137}Cs$ fallout occurred up to 1963 and the depth distribution of the $^{137}Cs$ in the soil profile is independent of time.

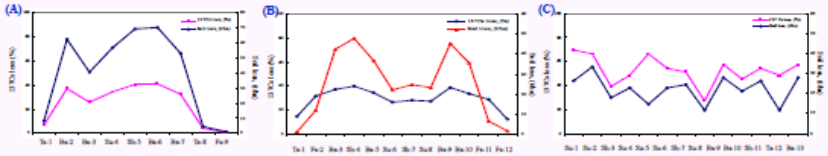



Fig 7. Relationship between soil loss and $^{137}Cs$ loss in the Granite (a), Gneiss (b) and Sedimentary (c) catchments (Su-summit slope, Sh-shoulder slope, Bs-backslope, Fs-Footslope and Ts-toeslope)

### CONCLUSION

- Rates of soil erosion and sedimentation, estimated from the spatial variability of the radionuclide 137Cs within the soil profiles, differ depending on the varying bedrock, soil properties, and hydrological processes.
- The radionuclide 137Cs input and its loss in the soil show the relative significance of the relationship between 137Cs loss and soil loss.
- Spatial distribution of radionuclide 137Cs has the relationships of :
  - significant: organic matter; water content, and clay content; and
  - insignificant: altitude; slope gradient, and soil permeability

This study is the modest contribution to the ongoing developments in the study of soil erosion for erosion control, measurement and prediction in Korea.

# Эзэмших арга, техник

- **Олон Улсын мэргэжлийн экспедицэд оролцох**

**Ач холбогдол:** **Шинэ арга зүйд суралцах**

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Evdokia Tema (Univ. of Torino); Sally Lowick (Univ. of Bern); Simone Priori (CRA-ABP, Firenze
Nathalie Dubois (EAWAG) and others

## ased on $^{14}$C dating for reconstruction uccession in southern Mongolia

xander Orkhonselenge

eomorphology, Department of Geography, School of Arts & ersity of Mongolia, Ulaanbaatar 15160, Mongolia

rkhnslng@num.edu.mn

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yellowish red sands BZ15-4 and the laminated gray mudstone lens BZ15-7 were deposited at 13250 cal yr BP and 10200 cal yr BP, respectively. The mudstone lens is expected as cross-bedded interval, occasionally exhibiting wind-ripple cross lamination during the Younger Dryas. This study infers that more dating of bottom units are thus needed to further support this result regarding the formation period of the succession and to reconstruct paleoclimate and paleoenvironmental changes in southern Mongolia.


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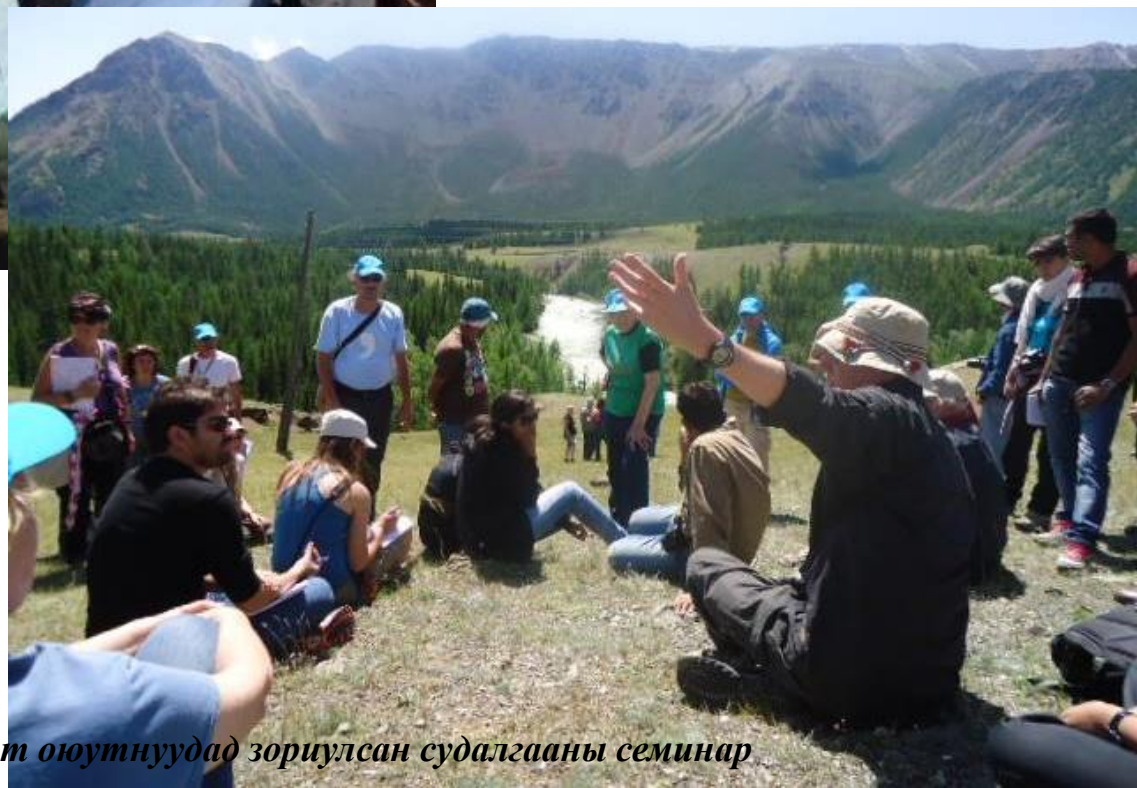

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| Holocene environmental changes in northern Mongolia inferred from diatom and pollen records of peat sediment<br>Y Fukumoto, K Kashima, A Orkhonselenge, U Ganzorig<br>Quaternary international 254, 83-91 | 13 | 2012 |
| Holocene sedimentary records from Lake Borsog, eastern shore of Lake Khuvsgul, Mongolia, and their paleoenvironmental implications<br>A Orkhonselenge, SK Krivonogov, K Mino, K Kashiwaya, IY Safonova, ...<br>Quaternary international 290, 95-109 | 9 | 2013 |
| Holocene hydro-environmental changes in northern Mongolia inferred from lacustrine sediments in Borsog Bay of Lake Khuvsgul<br>A Orkhonselenge, K Mino, K Kashiwaya, S Krivonogov, T Yamamoto, ... | 4 | 2011 |
| Holocene Landform Evolution of Lake Khuvsgul basin, Mongolia<br>A Orkhonselenge, SK Krivonogov, K Mino, K Kashiwaya, M Yamamoto, ...<br>Géomorphologie: relief, processus, environnement 20 (4), 343-354 | 1 | 2014 |

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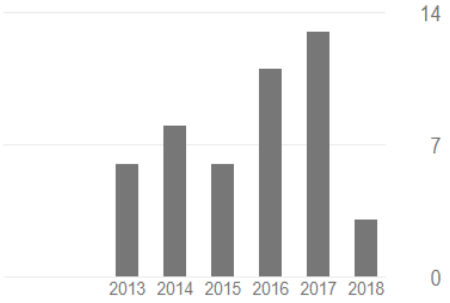


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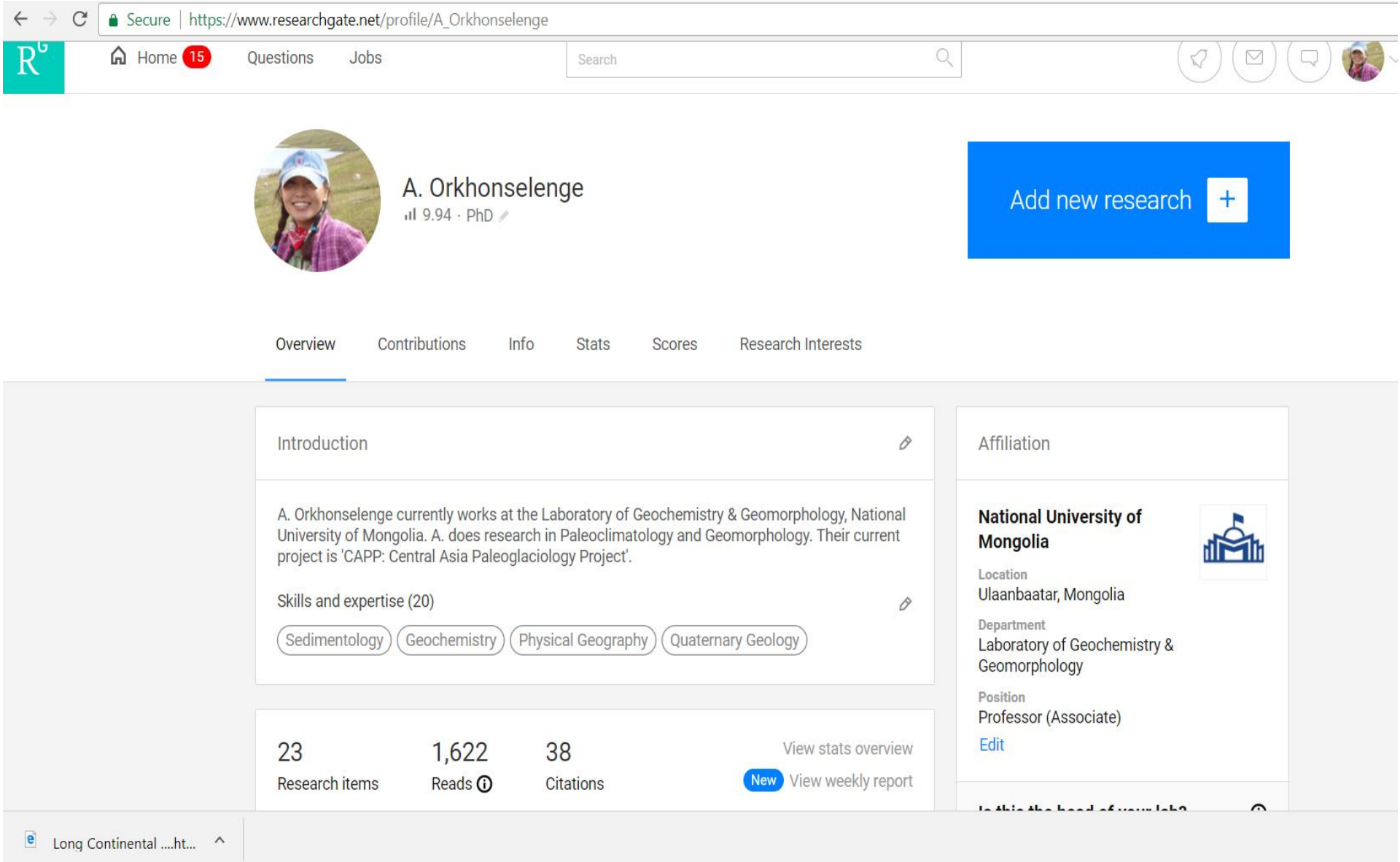

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## Introduction

Frank Lehmkuhl currently works at the Department of Geography, RWTH Aachen University. Frank does research in Geomorphology, Quaternary Geology and Geography. Their current project is 'Collaborative Research Centre 806 - Project B1: The „Eastern Trajectory“: Last Glacial Palaeogeography and Archaeology of the Eastern Mediterranean and of the Balkan Peninsula.'

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Aachen, Germany

Department
Department of Geography

Position
Chair, Physical Geography and Geoecology

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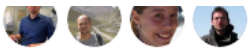

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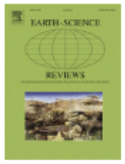

# Holocene moisture evolution across the Mongolian Plateau and its surrounding areas: A synthesis of climatic records

Wei Wang [a], Zhaodong Feng [b]

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## Abstract

Based on the review of 26 high-standard Holocene climatic reconstructions (mainly pollen-based) from the Mongolian Plateau and its surrounding areas, temporal and spatial patterns of the Holocene moisture evolution are synthesized. The regionally-averaged moisture history from the summer monsoon-influenced semiarid belt in China (i.e., Region A) demonstrates that the moisture index curve is broadly in agreement with the synthesized East Asian Monsoon Strength curve, both following the general trend of the West Tropical Pacific SST that is in turn the delayed response to the northern hemispheric summer solar insolation. The regionally-averaged moisture indices from the winter monsoon-dominated southern Siberia including Lake Baikal area and the Altai Mountains (i.e., Region B) exhibit a general declining trends since 10.6–9.6 cal. kyr BP,

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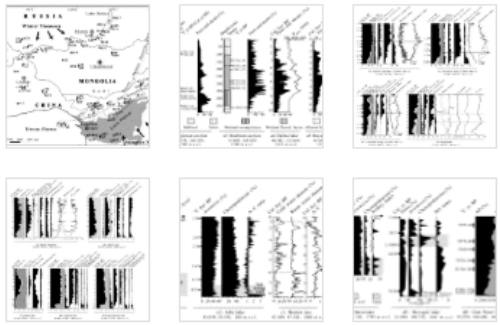

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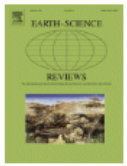

# Holocene moisture evolution across the Mongolian Plateau and its surrounding areas: A synthesis of climatic records

Wei Wang [a], Zhaodong Feng [b]

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## Abstract

Based on the review of 26 high-standard Holocene climatic reconstructions (mainly pollen-based) from the Mongolian Plateau and its surrounding areas, temporal and spatial patterns of the Holocene moisture evolution are synthesized. The regionally-averaged moisture history from the summer monsoon-influenced semiarid belt in China (i.e., Region A) demonstrates that the moisture index curve is broadly in agreement with the synthesized East Asian Monsoon Strength curve, both following the general trend of the West Tropical Pacific SST that is in turn the delayed response to the northern hemispheric summer solar insolation. The regionally-averaged moisture indices from the winter monsoon-dominated southern Siberia including Lake Baikal area and the Altai Mountains (i.e., Region B) exhibit a general declining trends since 10.6–9.6 cal. kyr BP,

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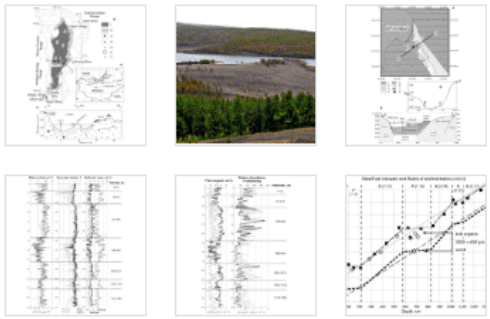

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# Holocene sedimentary records from Lake Borsog, eastern shore of Lake Khuvsgul, Mongolia, and their paleoenvironmental implications

A. Orkhonselenge [a, 1], S.K. Krivonogov [b, c], K. Mino [a], K. Kashiwaya [a], I.Y. Safonova [b, c], M. Yamamoto [a], K. Kashima [d], T. Nakamura [e], J.Y. Kim [b]

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## Abstract

This paper presents new sedimentological, geochronological and diatom data from a 13-m core of sediment from Lake Borsog, a former bay of Lake Khuvsgul (also known as Hovsgol and Khubsugul) in northwestern Mongolia. Lake Borsog was separated from Khuvsgul during the early stages of a post-glacial transgression and possesses a high-resolution record of the Holocene. The data show three short events of higher-rate sedimentation at 7.4–7.1, 4.8–4.5, and 1.0–0.9 ka cal. BP, which are possibly related to lake level drops, reduction of lake area, progradation of the delta of the Borsog River and higher erosion of the exposed lake shores. The drops in lake level match the previously

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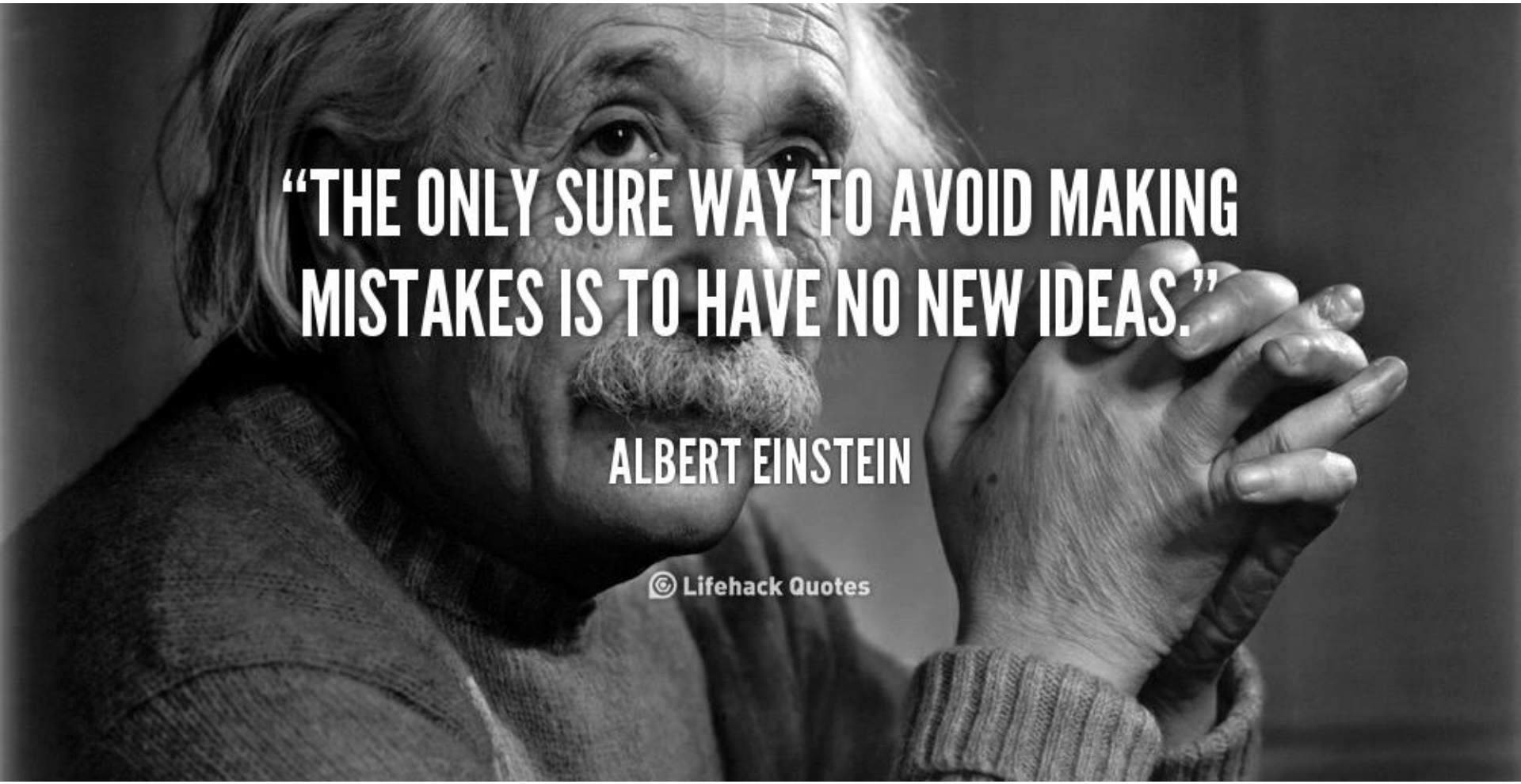


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