

Short Course on

GEOSPATIAL MODELLING IN FORESTRY AND ECOLOGY FOR CLIMATE CHANGE RESPONSE STUDIES

April 16-27, 2018



Conducted by
Indian Institute of Remote Sensing (IIRS)
Indian Space Research Organisation
Dept. of Space, Govt. of India
4, Kalidas Road, Dehradun, India
www.iirs.gov.in



Organized by
**Centre for Space Science and Technology
Education in Asia and the Pacific (CSSTEAP)**
(Affiliated to the United Nations)
IIRS Campus, 4, Kalidas Road, Dehradun, India
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Governing Board Members and Special Invitees during 22nd Governing Board Meeting at Bengaluru on November 15, 2017

INTRODUCTION

Climate change is a reality and almost all ecosystems are under threat due to it. Climate change as we know is the change in the climatic regimes due to changes in the global biogeochemical regimes and the resulting radiative forcing. Although climate change is not perceptible due to the relatively long time interval required to manifest, so its impact on the ecosystems has to be observed over long duration. The natural ecosystems dominated mostly by forests provide most of the basic ecosystem services. Therefore, changes in the ecosystem services due to the change in the climatic regimes may result in major socio-economic and cultural changes in the present human civilization. Some of the important impacts of the climate change on the forest ecosystems are changes in the phenology, shift of the high altitude species, shift in the tree line, etc.

Modelling is a tool extensively used by researchers to understand and simulate a complex system. Models give us an insight into the working of complex systems like climate, ecosystems, hydrology etc. Climate change scenarios have been generated using Global Circulation Models (GCM) and the Regional Circulation Models (RCM). Understanding the impact of climate change on the ecosystems and the vegetation due to simulated impacts of climate change requires development and execution of models wherein we can simulate the effects of the probable impacts of climate change on the vegetation response like phenology, species movement and range shift, biodiversity distribution, etc.

The recent development in computer and related technologies opens up new vistas for natural resource management using Earth Observation and geo-information tools. Geoinformatics provides a framework for measurement, monitoring, modeling, planning, decision-making and management of our environment and natural resources. With the introduction of GIS, ecological modeling has reached a new dimension as the impact of anthropogenic pressure and climate change can be modeled in time and space. Advances in GIS based modelling include

improvement in spatial and temporal data for developing effective models for forestry and ecological applications for climate change response.

ABOUT CSSTEAP

The Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP) (www.cssteap.org) was established in India in November 1995 with its headquarters in Dehradun and is considered as the Centre of Excellence by UN-OOSA. The 1st campus of the Centre was established in Dehradun, India and is hosted by Indian Institute of Remote Sensing (IIRS) which is a Unit of Indian Space Research Organisation (ISRO), Government of India. For conducting its Remote Sensing & GIS programmes the Centre has arrangement with IIRS as a host institution. The Centre has also arrangement with Space Application Centre (SAC), ISRO, Ahmedabad, playing as host institution for programmes related to Satellite Communications, Satellite Meteorology and Global Climate, Global Navigation Satellite System; and with Physical Research Laboratory, Ahmedabad for Space and Atmospheric Sciences.

The Centre has been imparting training and



CSSTEAP HQ Dehradun

education, helping participants in developing research skills through its Master Degree, Post Graduate and Certificate programmes. This is achieved through rigorous classroom lectures (theory and hands-on exercises), group discussions, field campaigns and pilot projects in the field of space science and technology. These programmes aim at capacity building for participating countries, in designing and implementing space-based information and application programmes. The Centre also fosters continuing education to its alumni. About 1958 professionals from 54 countries within and outside the Asia-Pacific region have graduated so far from the Centre.

OBJECTIVE OF THE COURSE

The overall objective of the training course is to generate awareness among users/ researchers/ professionals/decisionmakers/academicians on the Advances in Geospatial Modelling in Forestry and Ecology for Climate Change Response Studies. The participants will be familiarized with different modelling techniques in Forestry and Ecology, including biodiversity modelling, species distribution modelling, Land-use and land-cover Change (LULCC) prediction modelling, modelling of corridors and connectivity, which are used to study the ecosystems and vegetation response to climate change. Apart from this, the participants will be familiarized with different IPCC AR5 scenarios and the RCPs. The participants will also carry out a mini project on use of species distribution models for observing climate change response.

ELIGIBILITY

Master's degree in science or Bachelor's degree in science/ engineering (4 year course) or equivalent qualification in the relevant field of study with at least 5 years of experience in teaching/research or professional experience in the field of remote sensing technology, life sciences, environmental science, botany, zoology, wildlife, forestry or ecology (for candidate with higher qualifications, the minimum experience may be relaxed). Candidate should have prior knowledge of geospatial technology. High school-level knowledge in mathematics and / or statistics is essential.

COURSE DURATION AND IMPLEMENTATION

The training course is being organized by Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP) and will be conducted by the faculty of Indian Institute of Remote Sensing, ISRO Dehradun, India during April 16-27, 2018. The course curriculum will be implemented through a mixture of theory lectures and practical exercises, by using state-of-art hardware, software and instrumentation facilities. The faculty consists of experienced scientists/engineers working at various centers of ISRO and other Departments. Each participant will be provided a PC loaded with image processing and GIS software to have hands-on experience.

LANGUAGE

The medium of the instructions/teaching is English. Proficiency in written and spoken English is essential. The candidates who are not proficient in English are advised **not to apply**. Applicants, who have done their higher studies in a medium (language) other than English, are required to submit TOEFL score or a diploma / certificate of English Language issued by an accredited language institution or by the local UNDP for satisfactory establishment of the applicant's competence in spoken and written English language. **Preference will be given to those who secure high score in TOEFL examination.** Nominating agencies are requested to kindly ensure this.

COURSE STRUCTURE

The course is modular in structure and provides a balanced treatment of classroom lectures and practical experience as follows:

Module 1 (1st week): Overview of geospatial modelling in forestry and ecology, IPCC climate change models and scenarios, GCMs and RCMs, Spatial biodiversity characterization and modelling, Species distribution modelling and their use in climate change studies, LULC change prediction modelling, Modelling corridor and ecological connectivity, Forest fire risk modelling in changing climate scenario.

Module 2. (2nd week): Mini project on one of the application of RS and GIS as mentioned above in groups or individually.

EXPECTED BENEFITS AFTER COMPLETION OF THE COURSE

After attending this course, the participants are expected to gain theoretical and practical knowledge on the Geospatial modelling in forestry and ecology for climate response studies. The participants should be able to use this knowledge in their country for ecological studies, particularly in response to climate change based on latest technology and models.

COURSE FEE AND ACCOMMODATION

A course fee of INR15,000 for participants from India and US\$ 300 for participants from other countries is charged which includes course materials and field trips. Accommodation for the participants will be arranged in hostel at IIRS, Dehradun. During the stay at Dehradun INR 50 per day will be charged towards room rent. The cost of consumables such as cooking gas need to be borne by the occupants themselves. If needed, the participants can also join mess for food, which is being operated by the students of IIRS. Director CSSTEAP may waive off the course fee in case of few meritorious applicants.

FELLOWSHIP TO PARTICIPANTS

The candidates are required to send their personal details /bio-data to the Course Director, Short course on “Geospatial Modelling in Forestry and Ecology for Climate Change Response Studies”, CSSTEAP, IIRS Campus, 4-Kalidas Road, Dehradun, India on the prescribed Application form, appended to this “Announcement Brochure”(or download from website: www.cssteap.org). Candidates are expected to make their own arrangements for all expenses. Preference will be given to the candidates who are financially supported by their organizations. A few fellowships covering to and fro intentional air travel, domestic air travel in India and living expenses (INR8,000 for 2 weeks) in India are available from Government of India. However, preference will be given to the fully self-sponsored

candidates or sponsoring organization candidates bearing international to and fro travel.

HEALTH AND INSURANCE

Medical, life and disability insurance should be undertaken before leaving their country for India by the Participants themselves or on their behalf by their sponsoring institute/organization not covering entire health and disability risk. No medical expenses will be borne by CSSTEAP. However, participants who receive the Fellowship of the Government of India will be paid medical expenses for minor ailments on actual basis (as an out patients only) as and when such expenses are incurred, CSSTEAP will have limited liabilities as far as medical expenses are concerned in such cases. Candidates in sound physical and mental health only need to apply. Please read the important instructions carefully, which are given at the end of the application form.

APPLICATION PROCEDURE

Dully filled application form attached at the end of this document (can also be downloaded from www.cssteap.org) need to be sent to the contact details given below. The application form along with education certificates needs to be forwarded through CSSPEAP Governing Board member in your country (please see details on the website) or through Indian Embassy/High Commission In your country or Your Embassy/ high Commission in your country or Your Embassy/ High commission in India after nomination by your employer. For faster processing the advance copy can be sent to us directly either through by post or email

ABOUT INDIAN INSTITUTE OF REMOTE SENSING

The Indian Institute of Remote Sensing (IIRS) - an ISO 9001:2008 institute, is a constituent unit of Indian Space Research Organisation (ISRO), Department of Space, Government of India. Since its establishment in 1966, IIRS is a key player for training and capacity building in geospatial technology and its applications through training, education and research in Southeast Asia. The training, education and capacity building

programmes of the Institute are designed to meet the requirements of professionals at working levels, fresh graduates, researchers, academia, and decision makers. IIRS is also one of the most sought after Institute for conducting specially designed courses for the officers from Central and State Government Ministries and stakeholder departments for the effective utilization of Earth Observation (EO) data in India.

To widen its outreach, IIRS has started live and interactive Distance Learning Programme (DLP) since 2007. IIRS has also launched e-learning course on Remote Sensing and Geo-information Science since August, 2014.

The Institute has a strong, multi-disciplinary and solution-oriented research agenda that focuses on developing improved methods/ techniques for processing, visualization and dissemination of EO data & Geo-information for various societal applications and better understanding of earth's system processes. Currently, Microwave, hyperspectral and high-resolution EO data

processing and their applications are some of the prime research areas. State-of-the-art laboratory and field-based instrumentation and observatories network help meeting the research goals and objectives.

IIRS hosts headquarters of Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP), affiliated to the United Nations and provides support in conducting the Remote Sensing and GIS training and education programmes. IIRS also plays a key role in the activities of Indian Society of Remote Sensing (ISRS), which is one of the largest non-governmental scientific societies in the country.

IIRS has so far trained more than 11,100 professionals from about 96 countries. Participants from Asia, Africa and Latin America have also benefited under SHARES Fellowship programme of the Department of Space, ITEC SCAAP fellowship scheme of the Ministry of external Affairs, Government of India, etc. For further details, please visit <http://www.iirs.gov.in>



IIRS, Dehradun



**CENTRE FOR SPACE SCIENCE AND TECHNOLOGY EDUCATION
IN ASIA AND THE PACIFIC (CSSTEAP)**
(AFFILIATED TO THE UNITED NATIONS)

APPLICATION FORM

**SHORT COURSE ON
GEOSPATIAL MODELLING IN FORESTRY AND ECOLOGY FOR CLIMATE CHANGE RESPONSE STUDIES**

(April 16 - 27, 2018)

Venue: IIRS, Dehradun, India

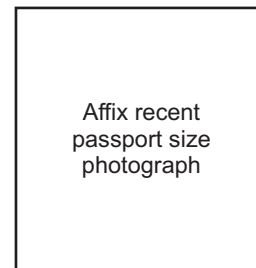
Last date for receipt of application: February 23, 2018

UMF&ECCRS

(For office use only)

Application No.:

Date received:



Affix recent
passport size
photograph

Important:

All the correspondence from CSSTEAP (issue of admission letter, e-tickets for travel, enquiries, etc) with prospective applicants will be on internet and sometimes on phone (Home/ Office), therefore kindly ensure that email-id, phone, fax, etc, are correctly and clearly mentioned.

(Please type or use CAPITAL LETTERS)

1. Name : (As mentioned in the Passport)
(Dr/Mr/Mrs/Miss):

First	Middle	Last
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2. Father's Name:
3. Name of mother/husband/wife:
4. Date of Birth (DD/MM/YYYY):
5. Place of Birth:
6. Gender (Male/Female):
7. Nationality:
8. Contact Information: Present official Address (Valid until what date):

 Contact number: (Please give complete Phone No. with country, city codes which will be useful to contact your family members in the case of emergency)
 Office (Tel): Office (Fax):
 Mobile: E-mail:
9. Permanent home Address (in your country):

 Contact number: (Please give complete Phone No. with country, city codes)
 Home (Tel): Home (Fax):
 E-Mail (alternate, preferably G-mail or Yahoo):.....
10. Nearest International airport (Specify the place/city):.....

Important:

- a) Interested persons may detach last 4 pages from this brochure and use them as **Application Form**.
- b) It is essential that full passport details are mentioned in the Application Form or provided to the last at the earliest.
- c) Application Forms without passport details may not be considered, however this information can be added or sent later on also
- d) Providing alternate email-id would ensure timely communication with applicants.
- e) For faster communication with the applicants CSSTEAP Secretariat will be using your email-id for all purposes (e.g. admission letter, air tickets and logistic arrangements).

13. (a) Activities & Projects in which your present organization is engaged (mandatory) and nature of your duties *

.....

(b) Main Scientific/Technical facilities available in your organization *(Including approximate number and type of computers, type of software available etc.)

.....

* If required attach separate sheet.

14. Have you done any other course (short or PG) from CSSTEAP (if 'yes', please give details including theme & year)

.....

15. How this short course on "UAV Remote Sensing & Its Application" will help you in your work/organization? Please describe below.

.....

16. DETAILS OF PASSPORT : Passport details are essential for selection of candidates and send copy of the passport whenever available.

Passport Number (Personal or Official)	Place of Issue (City and country)	Date of issue	Passport valid up to	Issuing Authority	Whether previously visited India if so place and date of last visit

17. PHYSICAL FITNESS

a) Are you suffering from any recurring/chronic/serious communicable disease which may affect your study program in India?

.....

Yes / No

b) If yes, please specify nature of illness (Candidates are advised to attach medical fitness certificate from a government hospital or government recognised hospital on hospital letter head).

18. How do you propose to meet the international travel and stay expenses in India? (preference will be given to those who will make their own travel or both travel and stay arrangement himself/herself).

.....

19. Stalking/smoking and drinking of alcohol in the office premise is not permitted. The participants are expected to wear proper and decent dress while in the campus and classroom as well as during field visits and educational tours.

20. The selected candidate need to abide by rules and regulation of the institute and maintain discipline harmony and will not indulge in unlawful activities in campus hostel or during educational and field visits.

19. DECLARATION BY THE CANDIDATE :

I have read the announcement brochure and will abide by the rules and regulations of the Centre. I have made / am making / have not made travel arrangements for attending the course and local expenses for the period of stay in India.

Date :

Place :

Signature of Candidate

20. SPONSORING / NOMINATING AGENCY CERTIFICATE

Dr/Mr./ Ms.working in this organisation is nominated and/or sponsored/ endorsed by (name of ministry department, organisation etc.) to attend the International Short Course on "Geospatial Modelling in Forestry and Ecology for Climate Change Response Studies" to be held at Indian Institute of Remote Sensing, Dehradun, India during April 16 - 27, 2018. We envisage to utilize his/her experience in specific tasks of our organization / agency. Following statements are mandatory for certification by the sponsorer.

- i. He/She will be/will not be provided international travel support.
 - ii. He/She will be / will not be provided financial assistance for the period of stay in India.
 - iii. He/She possesses adequate knowledge of English Language required for the course.
- (Mandatory: please tick appropriate option)

Date :	Signature:
Place :	Name in Capital Letters :
	Designation:
	Phone No. :
	Fax No. :
	E-mail:

(Official seal of the sponsoring or nominating authority including CSSTEAP GB member)

Note: Application without official seal of sponsoring or nominating authority and their details will not be considered.)

21. FORWARDING NOTE BY THE RESPECTIVE INDIAN EMBASSY HIGH COMMISSION IN YOUR COUNTRY OR YOUR EMBASSY /HIGH COMMISSION IN INDIA.

This is to forward the application of Dr/Mr/ Ms..... of (Specify the Country Name here) for the "Geospatial Modelling in Forestry and Ecology for Climate Change Response Studies" to be held at Indian Institute of Remote Sensing, Dehradun, India during April 16 - 27, 2018.

Date :	Signature :
Place :	Name :
	Designation :
	Phone No. :
	Fax No. :
	E-mail :

(Official seal of the Embassy / High Commission of India in your country or of your country in India)

Note: Application without official seal of Embassy or High Commission will not be considered

N.B. Please send an advance copy of the application form duly signed by the sponsoring agency to the Course Director, **(Short Course on "Geospatial Modelling in Forestry and Ecology for Climate Change Response Studies)** CSSTEAP, IIRS Campus, 4, Kalidas Road, Dehradun-248001, India by fax (+91-135-274-0785) for quick processing. Original copy to be sent through Embassy/High Commission of respective country at New Delhi duly signed by the sponsoring or nominating authority.

IMPORTANT

- The application which is not complete in all respects is likely to be rejected.
- **Candidate must attach copies of certificates of**
 - (a) Medical fitness to attend the course including Chest X-ray (PA), Blood Test (including Random Blood Sugar, HIV, Pregnancy HBs, Ag, Urine complete) (in case any medical information requiring attention is hidden and if found during the course, the centre will be compelled to send the candidate back home at the cost of nominating agency or the candidate.
 - b) Expecting mothers are advised not to apply for the course.
 - c) Stalking/smoking and consuming alcoholic drinks in class room and office campus is prohibited.
 - d) Proof of Proficiency in English needs to be provided or **certificate by the nominating agency is to be provided.**
 - e) Attach copy of Highest degree obtained (Degree certificate and marks sheet/grade card)
 - f) Attach copy of All Degree Certificates, if not in English, may please be translated in English and attested by the Head of the organization or transcript in English can also be submitted and authenticated appropriately.

About Dehradun

Dehradun, the capital of Uttarakhand state, is located in one of the outer valleys of Himalaya in Northern India. The valley is surrounded by dense forest and provides pristine environment for academic pursuits. World famous Rajaji National Park, famous for Tigers, Elephants etc. is located adjacent to the city. Dehradun is well connected by air, train and road from Delhi, the national capital. IIRS campus is about 6 km from railway station and about 25 km from airport. Many important national organizations/ institutions are located here. Mussoorie, the famous hill station, is about 30 km from Dehradun. Haridwar and Rishikesh, the two famous pilgrim centers, are about 55 km and 40 km, respectively from Dehradun. Weather of Dehradun during May is usually warm.

Important Dates

- Last date for receipt of application : February 23, 2018
- Notification of admissions : February 28, 2018

List of selected participants will be hosted on CSSTEAP website (www.cssteap.org).

Contact Details

Course Director

Short course on Geospatial Modelling in Forestry and Ecology for Climate Change Response Studies, Centre for Space & Science & Technology Education in Asia and the Pacific (Affiliated to the United Nations)
IIRS Campus, 4, Kalidas Road, Dehradun-248001, India
Ph: + 91135-2524266/2524170,
Fax : +911352740785/2741987
Email: cssteap@iirs.gov.in Website: www.cssteap.org



IIRS Campus**Indian Institute of Remote Sensing,**

4, Kalidas Road,
Dehradun 248 001 (INDIA)
Tel. : +91-135-274 4583
Fax: +91-135-274 1987

SAC Campus**Space Applications Centre,**

Ambavadi Vistar P.O. Jodhpur Tekra
Ahmedabad 380 015 (INDIA)
Tel. : +91-79-2691 3344
Fax: +91-79-2691 5843

PRL Campus**Physical Research Laboratory**

Navrangpura,
Ahmedabad 380 009 (INDIA)
Tel. : +91-79-2630 8550
Fax: +91-79-2630 0374

ISAC Campus**ISRO Satellite Centre**

Vimanpura Post
Bengaluru 560 017 (INDIA)
Tel. : +91-80-2520 5252
Fax: +91-80- 2520 5251

Delhi Office

Department of Space
Lok Nayak Bhawan
Khan Market, 3rd floor,
New Delhi 110 003 (INDIA)
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Fax: +91-11- 2469 3871

**CSSTEAP Headquarters,
IIRS Campus,**

4, Kalidas Road,
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cssteap@gmail.com
Website: www.cssteap.org