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生态系统碳循环遥感反演模型与方法培训（多伦多大学陈镜明教授主讲）

时间：7月29日—7月31日

地点：生态网络多功能厅

Agenda

Training workshop on remote sensing carbon modeling methods
Lecturer: Prof. Jing M. Chen, Department of Geography, University of Toronto, Canada

Day 1, 29 July, Monday
Lecture 1: Introduction
(9:00 am -12:00 pm)

1.1. Introduction to the CIDA CCS project
1.2. Brief overview of global carbon cycle research based on remote sensing
1.3. Overview of remote sensing and carbon cycle research in Canada

Lecture 2: Methods for ground measurements of LAI
(1:30 pm ?C 5:00 pm)

2.1 LAI definition
2.2 Methods for direct and indirect measurements of LAI
2.3 Principles of indirect measurements of LAI
·   Gap fraction
·   Gap size and gap size distribution
2.4 Currently available optical instruments for measuring LAI
·   LAI-2000
·   Demon
·   Decagon
·   Hemispheric photography
·   TRAC
2.5 Principles of TRAC

2.6 Demonstration of TRAC operation and calculation

Day 2, 30 July, Tuesday
Lecture 3: LAI remote sensing methods
(9:00 am ?C 12:00 pm)

3.1. Ground LAI plots and remote sensing pixels
3.2. Methods for retrieval LAI
· Vegetation indices
· End member
· Direct model inversion
· Indirect model inversion
3.3. LAI map validation
3.4. Scaling from ground plots to coarse-resolution pixels
3.6. Use of multiple angle remote sensing for LAI and clumping retrieval

Lecture 4: Geometric Optical Models
(1:30 pm ?C 5:00 pm)

4.1. Brief introduction to canopy radiative transfer models
· Monte-Carlo models
· Radiosity models
· Ray tracing models
· Geometric optical models
4.2. Geometric optical models
· Li-Strahler model
· 4-Scale model
· 5-Scale model: multiple scattering scheme and hyperspectral simulations
4.3. Demonstration of the 5-scale model
4.4. Examples of applications using the 5-scale model

Day 3, 31 July, Wednesday
Lecture 5: Methods for NPP modeling
(9:00 am ?C 12:00 pm)

5.1. Empirical models
5.2. Leaf-level photosynthesis model
5.3. Canopy-level photosynthesis models
· big-leaf models
· multi-layer models
· sunlit and shaded leaf separation models
5.4. NPP validation methods
· biomass
· tree ring
· eddy-covariance flux and ground chambers
5.5. Canada-wide NPP mapping and validation

Lecture 6: Mothods for modeling NEP and NBP
(1:30 pm ?C 5:00 pm)

6.1. NEP and NBP definition
6.2. Concept of carbon residence time

6.3. Concept of pre-industrial equilibrium in carbon cycle

6.4. Introduction to the InTEC model

6.5. Spatially aggregated and spatially explicit modeling of carbon cycle in Canada's forests.

· NPP-age relationship

· Fire scar age mapping

· Growing season length

· Nitrogen deposition

· CO2 fertilization

6.6. Remaining problems and discussion

欢迎光临!