PREFACE

Department of Environmental Science was established in 1966 with the original name as General Science Department. For many years, our undergraduate program as an integrated double majors in science has reflected a strong interdisciplinary education. Students have developed a capacity for the independent judgment and creative thought that are necessary for life in a complex society and environment. Later, the environmental science program has been taught since 2005.

Entering the new decade, in 2018, the department took up future challenges of establishing new graduate programs, M.Sc. and Ph.D. in Industrial Toxicology and Risk Assessment. These programs consist of coursework and research activities which integrate knowledge of safety, environment and health. An interdisciplinary approach which recognizes theoretically basic science that helps students deal with issues of environment is also emphasized. In this academic year of 2020, we are successfully launched our master degree to our first lot of graduate students.

This Research Highlights was annually published since 2018 as an introduction to which research areas that are being conducted by our faculty members. Additionally, the academic position promotion and the new publications of our staff were recorded in the Research Highlights 2020. These information can be used as a guideline for students and researchers seeking for collaboration with our faculty members. The comprehensive details and updated publications can be reached on-line via international scientific databases and our department website www. http://www.envisci.sc.chula.ac.th/.

Professor Wanida Jinsart, Ph.D.
Head of the Department of Environmental Science
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PROFESSOR
WANIDA JINSART

Professor

Ph.D. La Trobe University 1993
M.Sc. Chulalongkorn University 1986
B.Sc. Kasetsart University 1981

Areas of Research Interest
Air Pollution, Environmental Health, Environmental Epidemiology and Industrial toxicology

Professional Experiences
Chulalongkorn University staff since 1982
Scientist, 1982-1994
Lecturer, 1994-1996
Assistant Professor, 1996-2001
Associate Professor, 2001-2012
Professor, 2012- present
Head department, 2002-2005 and 2018-2020
President of Thai Society of Higher Education Institutes on the Environment, 2017-2021
Chair Industrial toxicology impact assessment Post Graduate Program, 2018-2020
Editor in chief, Environment Asia (Scopus Journal), 2017-2021

Research Emphasis
My research focuses on Air pollution and health effect, for more detailed research outcomes see selected publications. Currently, my work is in the application of air modeling and climate change including the weather and the impact modeling.

Measure of Esteem
Professor award, Chulalongkorn University, 2017

Selected Publications
Selected Publications (Cont.)

distribution techniques for health risk assessment in Bangkok. Human and Ecological Risk As

activities in Bangkok on PM 2.5, PM 10 and heavy metal composition. EnvironmentAsia, 12,
28-35.


visibility effect in Chiang Mai Province Thailand. Applied Environmental Research, 40(3), 1-10.

Dioxide and Sulfur Dioxide Exposure from a new developing coal power plant in Thailand.
EnvironmentAsia 10(2), 186-194.


matter and polycyclic aromatic hydrocarbons profiles from biodiesel vehicles emission.
Sustainable Energy and Technology Asia (SETA2016), Bangkok, Thailand.

species in epiphytic Tillandsia (Bromilliaece). International Journal of Advances in Science,
Engineering and Technology 2016, 4(2), 136–140.


emissions in Map Ta Phut, Thailand using AERMOD modeling and GIS. International Journal
of Geoinformatics 12(1), 57–63.
Selected Publications (Cont.)


GIS-based maps of the HQs of PM2.5 in the CBD of Bangkok.


Textbook

2. วันิตา จี้เสาว์ (2551). “มลพิษอากาศและการจัดการคุณภาพอากาศ” สั่งกับห้องแซมแห่งจุฬาลงกรณ์มหาวิทยาลัย จำนวน 285 หน้า (in Thai)

Academic articles

Research to Serve Society
Editor in chief, Environmental Asia 2017 - present

NAIYANAN ARIYAKANON

Associate Professor

+66 2 218 5190
Naiyanan.A@chula.ac.th

Ph.D. The University of Tokyo 2000
M.Sc. Chulalongkorn University 1995
B.Sc. (2nd Honor) Chulalongkorn University 1993

Areas of Research Interest
Phytoremediation, Remediation technology and Soil pollution

Professional Experiences
Associate Professor, Chulalongkorn University, 2017 – present
Assistant Professor, Chulalongkorn University, 2006 – 2016
Lecturer, Chulalongkorn University, 1995 – 2006

Research Emphasis
My research focuses on the removal of pollutants (pesticides, heavy metals and nutrients) from water using aquatic plants including water hyacinth, water lettuce and duckweed. Application of phytoremediation to treat contaminated soil is also my recent study. In wastewater treatment system, applying biochar from agricultural wastes to improve the water quality is another aspect of my research.

Selected Publications
Selected Publications (Cont.)


Book

NUTA SUPAKATA

Associate Professor

Ph.D. Kasetsart University 2011
M.S. Colorado School of Mines 1999
B.Ed. Chulalongkorn University 1995

Areas of Research Interest
Waste utilization and Environmental communication and education

Professional Experiences
Associate Professor, Chulalongkorn University, 2017-present
Assistant Professor, Chulalongkorn University, 2014-2017
Lecturer, Chulalongkorn University, 2000-2014

Research Emphasis
My research addresses two broad topics: the waste utilization; and the environmental communication and education. Here is a description of my current research areas:

Waste Utilization - My current work on this topic focuses on alternative management for community and industrial waste. This includes the application of using waste for renewable energy and construction materials.

Environmental Communication and Education - My current work on this topic focuses on exploring the application/media and practices of motivation to increase waste separation and reduction to community/public

Measure of Esteem
Honorary Award in Academic Teaching from Faculty of Science, Chulalongkorn University, 2014
Outstanding Young Lecturer Award from Chulalongkorn University, 2014

Selected Publications
Selected Publications (Cont.)


ROONGKAN NUISIN

Associate Professor

Ph.D. Chulalongkorn University 2003
M.Sc. Chulalongkorn University 1999
B.Sc. Chiang Mai University 1996

Areas of Research Interest
Polymeric substrate for environmental applications, Biopolymers in environment and Polymer synthesis

Professional Experiences
Associate Professor, Chulalongkorn University, 2019-present
Assistant Professor, Chulalongkorn University, 2010-2019
Lecturer, Chulalongkorn University, 2004-2010

Research Emphasis
1. To fabricate the composite polymeric materials for environmental applications
2. To establish membrane emulsification techniques on the design of polymeric and biopolymeric materials with the purposes of maintaining and controlling the bio-activity of essential oil for cosmetics and drug applications.

Measure of Esteem
Chulalongkorn University Distinguished Award in Student Affairs (Academic Year 2015, March 22, 2016)

Selected Publications


**Textbooks**

**Review Articles**

**Patent**
CHOKCHAI YACHUSRI

Assistant Professor

M.Sc. Chulalongkorn University 1992
B.Sc. Thammasat University 1989

Areas of Research Interest
Air pollution control, Noise pollution and occupational noise assessment and control and Vibration exposure

Professional Experiences
Assistant Professor, Chulalongkorn University, 2006 – present
Lecturer, Chulalongkorn University, 1996 – 2006

Research Emphasis
Noise, disturbing and unpleasant sound, does not affect only hearing organs, but also physiological body functions e.g. disruptive effects on concentration and sleep, heart rate, blood pressure, and respiratory rate. Excessive noise and impulse noise particularly cause occupational diseases. People can find low noise levels annoying as well. On the other hand, vibration exposures are transferred from a tool/machine to individual’s body. Typical symptoms from vibration include white finger, numbness, lower back pain. What people exposes to noise and vibration is up to the individual. The assessments of noise and vibration are crucial not only to comply with the National Occupational Safety and Health legislation to specifies safety zone for workplace exposure levels, but also demands the employer’s responsibilities to protect their workers’ health.

Textbook

Supervised Senior Projects
Supervised Senior Projects (Cont.)


6. Intharapong, N. and Yachusri, C., 2013. Contents of heavy metals in particulate matter less than 2.5 microns expose to police and pedestrians around Bangkok's intersections.

7. Kaechat, P. and Yachusri, C., 2013. Exposure of parking lot security guards to particulate matter less than 2.5 microns in Bangkok.
TASSANEE PRUEKSASIT

Ph.D. The University of Tokyo 2001
M.Sc. Chulalongkorn University 1996
B.Sc. Chulalongkorn University 1992

Areas of Research Interest
Ambient and indoor air pollution and Environmental health risk assessment

Professional Experiences
Assistant Professor, Chulalongkorn University, 2014 – present
Lecturer, Chulalongkorn University, 1997 – 2013

Research Emphasis
My research focuses on air pollution either in ambient or indoor air environments. The examples listed below highlight my research topics related to air pollution and health risk assessment.
- Determination of ambient and indoor air concentrations of particulate matters, gases and volatile organic compounds
- Analysis of inorganic and organic composition (i.e. heavy metals, polycyclic aromatic hydrocarbons, etc.) of particulate matters distributed both in indoor and outdoor environments.
- Investigation on spatial and temporal variation of air pollutants particularly in urban air environment
- Estimation of inhalation exposure and health risk levels to key pollutants released from indoor and outdoor sources of residential, workplace, industrial and general areas

Selected Publications
Selected Publications (Cont.)


SITTHICHOK PUANGTHONGTHUB

Assistant Professor

+66 2 218 5189
Sitthichok.P@chula.ac.th

Ph.D. University of North Carolina at Chapel Hill 2006
M.Sc. University of North Carolina at Chapel Hill 2002
M.Sc. Mahidol University 1999
B.Sc. Mahidol University 1995

Areas of Research Interest
Climate change to enhance air pollution, Health risk assessment related to occupational and air pollution exposure and Environmental epidemiology of landfill and electronic waste communities

Professional Experiences
Board of Directors, The Thai Society of Higher Education Institute on Environment, 2013-present
Head, Department of Environmental Science, Chulalongkorn University, 2014-2018
Environmental and Health Impact Assessment (EHIA) working committee of The Independent Commission on Environment and Health to review a Phenol Production Facility (Extension 2) by PTT Phenol Company Limited, 2012
Secretary, Department of Environmental Science, Chulalongkorn University, 2006-2010

Research Emphasis
I am currently working on how to predict ambient air pollutants such as ozone and fine particulate matters using data over decades of their co-pollutants and metrological parameters through multivariate regression models. Results can be used to understand how these pollutants would be fluctuating over different climate change conditions and for authorities to plan to mitigate community’s related health risks. Also, I have recently investigated the associated increased risks of sensitive population residing in communities of solid-waste landfills and electronic waste sites such as pre-school and school children and pregnant women of unfavorable outcomes of nervous system disorders, respiratory symptoms, and adverse birth outcomes. Its findings could be used for policy makers to alleviate specific factors posting to health risks of those.
Selected Publications


SARAWUT SRITHONGOUTHAI

Assistant Professor

- Ph.D. Ehime University 2004
- M.Sc. Kagawa University 2001
- B.Sc. Kasetsart University 1996

Areas of Research Interest
Water pollution and their effects on aquatic ecology, Aquatic toxicology and risk assessment, Eco-friendly technologies for wastewater treatment and Applied microscopic bubbles for mari-culture management

Professional Experiences
Assistant Professor, Department of Environmental Science, Chulalongkorn University, 2016-present
Lecturer, Department of Environmental Science, Chulalongkorn University, 2008-2016
Post Doctorial Researcher, Prefectural University of Kumamoto, Japan, 2004-2008

Research Emphasis
Microscopic bubbles (MB) injection in the polluted cage farms was improved 5-13% higher DO, 1-2% better feed consumption, 5-7% better carbon digestion and 23-39% better growth rate. Subsequently, the MB injection makes more food, good profit and improves better environment.
Selected Publications


Academic Articles


Textbooks


PASICHA CHAIKAEW

Assistant Professor

Ph.D. University of Florida 2014
M.Sc. Mahidol University 2005
BBA. Maejo University 2004

Areas of Research Interest
Pedometrics, Environmental mapping and modeling, Soil security and Sediment contamination

Professional Experiences
Assistant Professor, Chulalongkorn University, 2017 – present
Lecturer, Chulalongkorn University, 2014 – 2017

Research Emphasis
My research focuses on the application of statistical and geostatistical methods applicable to empirical and legacy data analysis in large scale areas of: 1) soil security, and 2) sediment contamination. Applying geostatistics in soil science addresses keys to understand the pattern of soil quality distribution and change in soil fertility due to environmental and/or anthropogenic forces. Assessing behavior of sediment contamination (nutrient enrichment, acid volatile sulfide, and heavy metals) in sediment is another aspect of my recent studies. The implication ranges from a small scale farming to the extent of regional and national levels.

Selected Publications
Selected Publications (Cont.)


VORAPOT KANOKKANTAPONG

Ph.D. Chulalongkorn University 2005
M.Eng. Kasetsart University 2001
B.PH. Sukhothai Thammathirat Open University 2006

Areas of Research Interest
Wastewater treatment technology, Industrial waste utilization, Solid waste management, Biomass utilization and Life cycle assessment

Professional Experiences
Assistant Professor, Chulalongkorn University, 2018 – Present
Lecturer, Chulalongkorn University, 2014 – 2018
Lecturer, Mahidol University, 2012 – 2014
Lecturer, Huachiew Chalermprakiet University, 2004 – 2010

Research Emphasis
My research interest is to solve the environmental problems in industries especially on waste and wastewater. The description of my current research areas is
- Application of industrial waste to treat wastewater in its factory via advanced oxidation and adsorption process.
- Utilization of biomass waste from industry via hydrothermal carbonization to be as peat moss or super adsorbent.

Selected Publications
Selected Publications (Cont.)


Academic Article


Textbooks


PANTANA TOR-NGERN

Assistant Professor

Ph.D. Duke University 2015
M.S. Duke University 2010
B.S.E Duke University 2009

Areas of Research Interest
Hydrologic and carbon cycling, Impacts of climate change and climate variability on terrestrial hydrologic and carbon cycles and Dynamic Global Vegetation Models

Professional Experiences
Assistant Professor, Chulalongkorn University, 2017–present
Lecturer, Chulalongkorn University, 2015 – 2017

Research Emphasis
My research focuses on water and carbon flows in forest ecosystems and their variations with environmental impacts including climate change, land-use change and extreme events. The main technique is measuring water flow in individual trees with self-constructed probes and then applying modeling approaches to estimate water loss and carbon absorption of forests. This method is performed across spatial scales and with high temporal resolution (at 30-minute intervals). Findings of mechanisms that control variations of water and carbon flows in forests can be used to improve the modeling of climate-vegetation feedbacks in the earth system models which is used to simulate climate change impacts on water-use and productivity of terrestrial ecosystems.

Measure of Esteem
Outstanding Young Researcher Award in Biological Science 2018, Faculty of Science, Chulalongkorn University

Selected Publications
   https://doi.org/10.1186/s12898-020-00289-4
Selected Publications (Cont.)


Website
https://forestfluxgroup.wordpress.com
SUPAWIN WATCHARAMUL

Lecturer
+66 2 218 5185
Supawin.W@chula.ac.th

Ph.D. University of Newcastle upon Tyne 2005
M.Sc. Chulalongkorn University 1996
B.Sc. Chulalongkorn University 1992

Areas of Research Interest
Environmental biotechnology, Biodegradation and bioremediation, Environmental toxicology and Soil microbial ecology

Professional Experiences
Lecturer, Chulalongkorn University, 1996 – present

Research Emphasis
The plant cell wall (PCW) is a complex macromolecule comprising crystalline cellulose imbedded in matrix polysaccharides such as pectins, xylans and mannans. In view of the complex nature of the substrate, PCW-degrading microorganisms synthesize a vast array of different glycoside hydrolases and esterases, which act synergistically to elicit complete saccharification of this recalcitrant macromolecule. Typically, PCW-degrading bacteria express endo-acting mannanases, cellulases (endoglu canases and celllobiohydrolases), xylanases, polygalacturonic acid hydrolases (and lyases) rhamnogalacturan hydrolases (and lyases) and an array of biocatalysts that remove the side chains from decorated hemicellulases and pectins. In addition, PCW-degrading microorganisms express numerous iso-forms of all the major endo-acting and certain key side-chain cleaving enzyme species. These iso-enzymes are not derivatives of a specific protein but are encoded by extensive multigene families. My research emphasizes on the diversity of these cellulases in Thai rice-field soils as determined using environmental cloning techniques in which community DNA extracted directly from a range of Thai soils has been amplified using PCR primers designed to target cellulases which belong to Glycosyl Hydrolase Families. Following construction of a clone library in pCR-TOPO, the clones were screened using a combination of denaturing gradient gel electrophoresis (DGGE) and restriction digest analysis to identify unique clones. Unique clones were sequenced and analyzed phylogenetically. These sequences have been used to design nucleic acid probes and these have been used in combination with phospholipid fatty acid analysis (PLFA), BIOLOG and microbial biomass analysis to monitor changes in the size, activity and diversity of microbial communities during the decomposition of rice straw. These highlights are providing new insights into the microbiology of decomposition in tropical soils and provide exciting new opportunities for the biotechnological exploitation of cellulases in Thailand.

Measure of Esteem
Distinguished Award of Student Affairs, Faculty of Science, Chulalongkorn University (Academic Year 2012)
Selected Publications

Textbooks

Review Article

Patent
SERMPONG SAIRIAM

Lecturer

Ph.D. Chulalongkorn University 2013
M.Sc. Chulalongkorn University 2009
B.Sc. Chulalongkorn University 2007

Areas of Research Interest
Wastewater treatment technology by Advanced Oxidation Processes (AOPs) and membrane technology

Professional Experiences
Lecturer, Chulalongkorn University, 2015 – present

Research Emphasis
As a consequence of the wastewater issues, control of wastewater emission from the industries is very important on these days. My research focus is to treat wastewater from the various industries such as textile industry by Advanced Oxidation Processes (AOPs) including Fenton processes and photocatalytic oxidation. Recently, AOPs and membrane technologies have received great attention to combine for increase the efficiency of wastewater treatment such as photocatalytic membrane and membrane contacting process with ozonation. The great efforts are to modify the suitable membrane properties for application. Modification is focused on addition of modifying agents or metals on the membrane surface and functionalization of membrane surface via chemical methods.

Selected Publications


Textbook
CHIDSANUPHONG CHART-ASA

Lecturer

Ph.D. The University of North Carolina at Chapel Hill 2014
M.Sc. Mahidol University 2005
B.Sc. Thammasat University 2001

Areas of Research Interest
Environmental data analysis and Environmental burden of disease assessment

Professional Experiences
Lecturer, Chulalongkorn University, 2018-present
Lecturer, Mae Fah Luang University, 2014-2018

Selected Publications
4. Chart-as, C., 2013. Quantifying health impacts of traffic-related fine particulate air pollution at the urban project scale (Doctoral dissertation). The University of North Carolina at Chapel Hill North Carolina, USA.
Meteorological variability (hourly)
Traffic variability (volume, behavior)
Roadway variability (slope and intersections)

Vehicle emissions model (MOVES) +
Air pollution dispersion model (CAL3QHCR) +
Bootstrap simulations

Model uncertainty factor
Modeled traffic-related PM$_{2.5}$ concentration
Health impact seasonal variability
Census block population by demographic group
Baseline health outcome rate by demographic group and season

Traffic-related PM$_{2.5}$ exposure concentration, $PM_{2.5}$

Concentration-response coefficient, $\beta(n,m)$

Attributable cases:

$$\Delta y_{ijklm} = y_{ijklm}^0 \times (1 - \exp(-\beta(n,m) \times PM_{2.5}))$$

i = census block
j = age group
k = gender
l = race
m = season (winter, spring, summer, fall)
n = health outcome
JATUWAT SANGSANONT

Ph.D. University of Tokyo 2011
M.Eng. University of Tokyo 2008
B.Eng. Chulalongkorn University 2006

Areas of Research Interest
Water disinfection, Microbial risk assessment, Microbial source tracking,
Health-related water microbiology

Professional Experiences
Lecturer, Chulalongkorn University, 2019 – present
Postdoctoral Researcher, University of Colorado Boulder, 2017-2018
Postdoctoral Researcher, University of Tokyo, 2012-2017

Research Emphasis
Jatuwat’s research focused on the viral disinfection mechanisms and the detection in water. He also had worked on waterborne pathogen monitoring in the water environment. He investigated the response of viruses to UV irradiation in order to improve current UV disinfection. His research involves the analysis of the effect of UV irradiation in early steps of adenovirus infection and DNA repair. Currently, his research interests include studying the prevalence of waterborne pathogens in the water environment in Thailand.

Selected Publications
Selected Publications (Cont.)


Booklet

1. Toward the sustainability of urban water system, report of student session at 8UDM & 2RHWM conference, The university of Tokyo and Seoul National university, September 7-12 2—9, Tokyo, Japan
SUMETH WONGKIEW

Ph.D. University of Hawai‘i at Mānoa 2018
M.Eng. Asian Institute of Technology (AIT) 2013
B.Eng. Chiang Mai University 2011

Areas of Research Interest
Biological treatment, Resource recovery, Nitrogen cycle, Aquaponics and bioponics, Wastewater engineering

Professional Experiences
Lecturer, Chulalongkorn University, 2019 - Present
Research assistant, Asian Institute of Technology, 2011 and 2013

Research Emphasis
My research focuses on bio-environmental processes including biological treatment, resource recovery, bio-engineering, soilless agriculture, and applied environmental toxicology and risk assessment, with emphasis on development of sustainable innovations that fit to the way of Bio-Circular-Green (BCG) economic model. My current studies are in the field of organic waste recycling technology, namely aquaponics, bioponics, and organic smart farming using nutrient recovery approaches, which are the integrations of environmental biotechnology, agriculture, and environmental science & engineering.

Selected Publications
Selected Publications (cont.)


