



**Proceedings of the**  
International Conference on Forest Therapy  
*Healing with Nature*

July 7 – 9, 2022

Faculty of Forestry  
The University of British Columbia  
Vancouver, BC

## About the Conference

Forest therapy is an emerging area of research that increasingly contributes to social and environmental needs at the global level. Over the last decades, a growing number of experts have been evaluating the therapeutic effects of forest-oriented stimulations and have found a wide range of benefits. Forest therapy is gaining ground as an accessible and reliable means to alleviate physiological and psychological conditions. In particular, over the last year forest therapy has been applied as a key approach to reducing pandemic-related stress.

Given the increasing importance of forest therapy, the University of British Columbia, in collaboration with an array of partners, organized an International Conference on Forest Therapy (ICFT). This 3-day virtual event (with an optional third day for immersive practices) included internationally-renowned forest therapy experts. The three Conference themes are:

1. Current research in Forestry Therapy
2. Integration of Forest Therapy into Public Health Systems
3. Forest Therapy Policy and Practice

Conference website: <https://forestry.ubc.ca/events/forest-therapy-conference/>

## Conference Program

The conference program included presentations and discussions on the first two days of the Conference (July 7-8, 2022) and an immersive day on July 9, 2022. The full schedule is attached at the end.

# Sponsor Acknowledgements



China Forest Therapy Committee



The Asia-Pacific Network for Sustainable Forest Management and Rehabilitation



Korea Forest Welfare Institute



Jiangxi Academy of Forestry



Urban Forests Research Hub



China National Forest Therapy Innovative Alliance



Asia Forest Research Centre



Forest Therapy Association, China Forestry Industry Federation



Jiangxi Agricultural University



Forestry College of Shanxi Agricultural University



Forestry College of Fujian Agriculture and Forestry University



Association of Nature & Forest Therapy (ANFT)



Nature and Forest Therapy of Canada



Multidisciplinary Institute of Natural Therapy



Conservation Conexions

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## Keynote Speakers

### Dr. Qing Li

Professor and Immunologist at Nippon Medical School, Tokyo, Japan



#### Keynote Presentation

“The secret healing power of nature (forests): From a Feeling to a Science”

#### Bibliography

Dr. Qing Li (MD, Ph.D.) graduated from Shanxi Medical University and got a Ph.D. from Kagoshima University. He is a professor at Nippon Medical School, President of the Japanese Society of Forest Medicine, Director of the Forest Therapy Society, Vice-President and Secretary-General of INFOM, Managing Vice Chairperson of Forest Health Maintenance Research of the World Federation of Chinese Medicine Society. He has studied at Stanford University. Prof. Li is the world’s foremost expert in forest medicine and immunology. He received Society Award from the Japanese Society for Hygiene in Forest Medicine in 2021 and University Award from Nippon Medical School in Forest Medicine in 2011.

Some people study medicine. Some people study forests. Dr. Li studies forest medicine to find out all the ways in which walking in the forest can improve our well-being. He started forest medicine research (Shinrin-yoku/Forest bathing/Forest therapy) in 2004 and has published many articles on forest medicine in scientific journals.

The terms **forest bathing** and **Shinrin-yoku** in English were first defined in his paper (Li Q, et al. [Forest bathing enhances human natural killer activity and expression of anti-cancer proteins](#). Int J Immunopathol Pharmacol. 2007;20(2):3-8.)

He established the new science, Forest Medicine and published Forest Medicine in 2012 in the USA (<https://novapublishers.com/shop/forest-medicine/>). This book has been translated into Chinese and Korea.

His book: **Shinrin-Yoku** was published by Penguin Random House UK in 2018 (<https://www.penguin.co.uk/books/308285/shinrin-yoku/9780241984857.html>). The book also was published in the USA under the title of **Forest Bathing** in 2018 (<https://www.penguinrandomhouse.com/books/579709/forest-bathing-by-dr-qing-li/>). **Forest Bathing ranked in the bestseller list in the USA).**

Moreover, the book has been translated into 26 languages including 1. French, 2. Spanish, 3. Dutch, 4. German, 5. Italian, 6. Russian, 7. Portuguese, 8. Hungarian, 9. Czech, 10. Slovak, 11. Polish, 12. Bulgarian, 13. Finnish, 14. Chinese Complex, 15. Danish, 16. Swedish, 17. Estonian, 18. Vietnamese, 19. Romania, 20. Simplified Chinese, 21. Korean, 22. Slovenian, 23. Lithuanian, 24. Turkish, 25. Japanese, 26. Thai.

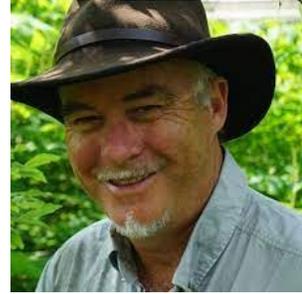
In 2019, he co-edited a new book: International Handbook of Forest Therapy published by Cambridge Scholars Publishing.

## Mr. Amos Clifford

Founder of the Association of Nature and Forest Therapy

### Keynote Presentation

“Forest Therapy: A Ten Year Perspective”



### Bibliography

Amos Clifford is the founder of the [Association of Nature and Forest Therapy Guides and Programs](#) and the author of the best-selling *Your Guide to Forest Bathing* (Conari Press 2018). After studying Buddhist philosophy for over 20 years, in 2004 Amos founded Sky Creek Dharma Center in Chico, California, where he emphasized the importance of meditation practice in wild places. By 2008 he no longer identified as Buddhist, instead preferring the nameless and sometimes unnamable experiences he had in natural settings and had been having since early childhood. This led to a deepening inquiry regarding relationships between humans and the more-than-human world. Between 2010 and 2012 Amos took his inquiry into wild places and with the help of the School of Lost Borders and Men of Spirit he had a year of intense wilderness practice, which led to the vision for the Association of Nature and Forest Therapy Guides and Programs. Inspired by the Japanese practice of Shinrin-yoku, Amos founded ANFT in 2012 and over the next two years developed what is now known as the “Standard Sequence” of the ANFT school of Forest Therapy. Amos holds a BS in Organization Development and an MA in Counseling from the University of San Francisco. He teaches about Forest Therapy and leads retreats internationally.

## Dr. Melissa Lem

Physician and Park Prescriptions (PaRx) Director

### Keynote Presentation

“PaRx: A Prescription for Patient and Planetary Health”



### Bibliography

Dr. Melissa Lem is a Vancouver family physician and Founder and Director of [PaRx](#), Canada’s national nature prescription program powered by the BC Parks Foundation. Also, as President-Elect of the [Canadian Association of Physicians for the Environment](#), she is an internationally recognized expert on the nature-health connection.

A senior writer for the CBC, her work has been widely published by media including the Vancouver Sun, Toronto Star, Montreal Gazette, The Narwhal and National Observer. She was the resident medical expert on CBC TV’s hit show Steven and Chris for four seasons and is a regular contributor to CBC Radio and CTV News.

Dr. Lem was the inaugural winner of University College’s Young Alumni of Influence Award at the University of Toronto, a 2020 Joule Innovation grant recipient from the Canadian Medical Association, a 2021 World Parks Week Ambassador, sits on the Advisory Committee of the IUCN World Commission on Protected Areas Health and Well-being Specialist Group, and is a Clinical Assistant Professor at the University of British Columbia.

## Dr. Won Sop Shin

Professor at Chungbuk National University in South Korea

### Keynote Presentation

“Forest Therapy for Personal Growth and Psychological Well-being”



### Bibliography

Dr. Won Sop Shin obtained his Ph.D. in forestry in 1992 from the University of Toronto, Canada.

Dr. Won Sop Shin is a professor at [Chungbuk National University](#) in Korea and Chair of the Korea Forest Therapy Forum. He has lots of experience in research and conducting projects on forest and human health for about 30 years. His main research interest is psychological benefits from forest and nature experiences. From 2013 to 2017, he served as Minister of Korea Forest Service (KFS), and Chair of Committee on Forestry, FAO. During his term, KFS developed many new forest policies relating to using forests for human health and welfare. He is now a Head of the Graduate Department of Forest Therapy at Chungbuk National University enrolling about 150 students in Masters and Ph.D. programs. Won Sop Shin is also working actively with international organizations such as the International Society of Nature and Forest Medicine.

## Dr. Guangyu Wang

Professor and Associate Dean, Asian Strategies, Faculty of Forestry,  
University of British Columbia



### Keynote Presentation

“Forest therapy: Linking ancient wisdom with science”

### Bibliography

Dr. Guangyu Wang’s research interests include sustainable forest management and integrated watershed management, specifically using computer modelling applications. He has completed several research projects on watershed-scale forest restoration and sustainable development projects, wherein he used system dynamic approaches, bioregional assessments and geographic information systems techniques to analyze the mechanisms of ecosystem degradation and model broad land use management. One of his major research focuses involves examining Chinese forest management practices, where he has been able to develop novel management plans and sustainable management models for Chinese forests. Furthermore, Dr. Wang is currently involved in several researches related to climate change, forest adaptation and carbon market mechanism.

As a previous business professional, Dr. Wang is also interested in the strategic planning and financial management of natural resources, in addition to the public perception and implementation efficiency of land use change policies.

### About MINT

**MINT** is a multidisciplinary group cooperating with different agencies, including UBC Faculty of Forestry, BC Cancer Research Center, UBC hospital, Association of Nature and Forest Therapy (ANFT), and other forest therapy business groups.

We aim to promote forest therapy and bridge the scientific gap between forest therapy activities and physiological and psychological impacts on human beings. Specifically, our team has the following objectives:

1. To identify the mechanism of the interaction between forest therapy and humans.
2. To analyze the different impacts of forest therapy activities on humans.
3. To determine the impacts of forest therapy on humans by different audience groups.
4. To develop an integrated approach for different forest therapy audience groups.

## Dr. Kathy Wolf

Research Social Scientist, at School of Environmental and Forest Sciences, University of Washington



### Keynote Presentation

“Where to Walk? Potential partnerships for forest therapy”

### Bibliography

Dr. Kathleen Wolf is a [Research Social Scientist](#) (retired, affiliate) at the School of Environmental and Forest Sciences, University of Washington. Following early career positions as a biologist, environmental planner and landscape architect she completed her Ph.D. at the University of Michigan. She then implemented a multi-decade research program at the University of Washington to investigate human response to outdoor spaces in cities, using theory and methods of environmental psychology. She was also a research associate with the US Forest Service Pacific NW Research Station collaborating on studies of social dimensions of urban forestry and ecosystems. Her research has spanned multiple disciplines and collaborations; publications include journals focusing on urban forestry, psychology, transportation, urban planning, marketing and public health. Dr. Wolf’s mission is to discover, understand and communicate human behaviour and benefits, as people experience nature in cities and towns. Kathy is committed to science translation and outreach and actively shares research at [www.naturewithin.info](http://www.naturewithin.info); and the Green Cities: Good Health project at: [www.greenhealth.washington.edu](http://www.greenhealth.washington.edu)

## Dr. Tamberly Conway

Founder and CEO of Conservation Conexions

### Keynote Presentation

“Under the Trees: Forest Therapy Stories in Mycelial Connection”



### Bibliography

Dr. Tamberly Conway, Ph.D., Founder and CEO of [Conservation Conexions](#), serves as a Certified Nature and Forest Therapy Guide, a Certified Forest Therapy Trail Consultant, Canopy Watch Board Co-Chair and a Dovetail Partners Associate. Tamberly served for 12 years with the USDA Forest Service Conservation Education Program, as a Conservation Education Specialist in Texas and a Partnerships, Diversity and Inclusion Specialist in Washington, D.C., where she focused on diversity engagement, health and nature initiatives, forest health/human health relationships, conservation education and community empowerment in conservation. Tamberly has been engaged in the health and nature realm for over 10 years, through a variety of unique partnerships between land management agencies, health care professionals, NGOs, educational institutions and others, creating traditional and non-traditional partnerships in conservation education and community engagement to reach diverse audiences with meaningful and relevant conservation and stewardship opportunities. During her tenure with the USFS, she worked to propel Forest Therapy within the agency and among diverse communities through funding bilingual Forest Therapy sessions at community events, engaging with Park Rx America in health and nature collaborations, and the implementing the first-ever bilingual Forest Therapy training in collaboration with a number of diverse partner organizations. Tamberly has served as an international speaker on the subject matter of propelling the Forest Therapy practice globally, and she most recently supported the facilitation of an international collaboration among the Korea Forest Welfare Institute, the Korea Forest Therapy Forum, the USDA Forest Service, the University of British Columbia and Conservation Conexions, to expand Forest Therapy research and practice in the field. She believes Forest Therapy and canopy ascents are powerful mechanisms to create relationships between people and the more-than-human world, thereby supporting the health of people and the land. Tamberly holds a B.S. in Wildlife Management from McNeese State University, an M.S. in Forest Recreation Management, and a Ph.D. in Forestry, with a focus on Human Dimensions in Natural Resources, from the College of Forestry and Agriculture at Stephen F. Austin State University.

## Dr. Uehara Iwao

Professor, Forest Science Department, Tokyo University of Agriculture



### Keynote Presentation

“Forest Therapy in Japan and its possibility in the world”

### Bibliography

上原 巖 (うへはら いわお)

- Professor of Silviculture in the laboratory of Forest Science Department of Tokyo University of Agriculture.
- An authorized counsellor by The Japanese Association of Counseling Science.
- President of The Society of Forest Amenity and Human Health Promotion in Japan.
- Major scientific fields: Silviculture, Forest Therapy, Forest Amenities
- Born in Nagano City, Japan in 1964

### Academic Background

- Exchange Student at Michigan State University (Forestry) from March 1986 to March 1987
- Graduated from Tokyo University of Agriculture in March of 1988
- Graduated from the Graduate School of Shinshu University (Master Course) in March of 1997. Degree of Master of Science.
- Graduated from the Graduate School of Gifu University (Doctor Course) in March of 2000. Degree of Doctor of Philosophy.

### Work History

- 1988-1995 Senior High School Teacher of Nagano Prefecture
- 1997-2001 Care Worker of Social Institution in Nagano
- 2002-2004 School Counselor of Nagano Prefecture Senior High Schools
- 2002-2004 Lecturer of Tokai Women’s University
- 2004-2006 Associate Professor of University of Hyogo
- 2006-2010 Associate Professor of Tokyo University of Agriculture
- 2011- Professor of Tokyo University of Agriculture

### Address

Silviculture Laboratory, Department of Forest Science  
Tokyo University of Agriculture  
1-1-1 Sakuragaoka, Setagaya-ku, Tokyo 156-8502 JAPAN  
(Phone & Fax) 81-3-5477-2268  
(E-Mail) [bigrock1964@hotmail.com](mailto:bigrock1964@hotmail.com)  
(Blog) <https://ameblo.jp/ueharaiwao/>  
(Society) <https://forest-and-human-health.jp/>

## Mr. Alex Gesse

Forest Therapy Hub Executive Director (Barcelona) – FTHub Method and LIM Model for Forest Therapy Interventions

### Keynote Presentation

“FT Hub Method and Liquid Interactions Model for Forest Therapy Interventions”



### Bibliography

Mr. Alex Gesse has a postgraduate degree in Business Administration and an E-MBA at EAE Business School of Barcelona. He is finishing a degree in Sociology and studying a degree in Psychology. He is a Public Health and Forestry advisor to the Union of South European Foresters (USSE) and other public institutions. He has collaborated as a consultant specialist in the Expert Group on Human Health and Wellbeing to Forest Europe. Within his work with the Forest Therapy Hub, together with a multidisciplinary team, he has developed The FTHub Method and the Liquid Interactions Model (LIM) for Forest Therapy. This broader and integrative approach brings together the latest scientific evidence in nature and health and traditional approaches, nowadays known as nature connectedness (or relational approaches to nature). FTHub has manualized programs for health prevention, specific mental health populations and children at risk of social exclusion. The FTHub Method and the LIM Model are based on more than 20 Forest Therapy pilot projects and research conducted in collaboration with universities and other institutions. FTHub projects have been referred to as case examples in several international publications and congresses from different geographies. Alex is the author of “Feel the Forest: The experience of Shinrin-Yoku (Forest Bathing), Penguin Random House Editorial Group, and co-author of “Baños de Bosque: 50 Rutas Para Sentir La Naturaleza” (Forest Bathing: 50 Routes to Feel Nature), Petit Fute, and “Feasibility and experience of a Forest Therapy intervention for adults enduring stress” (Forests for Public Health, Chapter 6, Cambridge Scholars Publishing 2020).

## Ms. Michiko Martin

Regional Forester of the USDA Forest Service



### **Bibliography**

Ms. Michiko Martin is the Regional Forester for the Southwestern Region of the USDA Forest Service and provides an essential role in carrying out agency goals enhancing shared stewardship opportunities with partners, meeting high-priority restoration goals across critical landscapes, protecting communities from wildfire, and providing the numerous benefits that flow from healthy forests and grasslands by strengthening all people's connections with the land. She leads more than 2,000 employees and oversees 20.6 million acres of national forests and grasslands in Arizona and New Mexico.

Michiko brings over 34 years of federal government career experience to her position. Michiko joined the USDA Forest Service in 2014 as a national director and from 2014-to 2021 has served as the Director of Conservation Education; Director of Recreation, Heritage and Volunteer Resources; and the Acting Director of Engineering, Technology and Geospatial Services.

Prior to joining the Forest Service, Michiko worked for 12 years as the Chief of Education, Outreach and New Media for the Office of National Marine Sanctuaries, with the National Oceanic and Atmospheric Administration (NOAA) in the Department of Commerce. Michiko also served as a commissioned naval officer for 12 years, working as a meteorologist and oceanographer. She directed the daily operations of an environmental support unit to naval forces in Okinawa, Japan, and assisted in the operation of global atmospheric and oceanic numerical models.

Michiko is a recognized expert in the field of environmental education, having served three years on the Board of Directors for the National Marine Educators Association, twice serving as an issue editor for *Current*, a nationally-recognized education journal for ocean education, and currently serving on the International Union for the Conservation of Nature's Commission on Education and Communication. She also has outstanding proficiency in science and engineering, with an extensive background in environmental modelling and numerical forecasting. Additionally, she has participated in oceanographic research cruises and holds a naval qualification to operate small boats.

A native of the Ryukyuan Islands, Michiko earned a Bachelor of Science in physical oceanography at the United States Naval Academy. She later earned post-graduate degrees, including a Master's of Science degree in oceanographic engineering jointly conferred by the Massachusetts Institute of Technology and Woods Hole Oceanographic Institute; and, a Master's degree in educational leadership at Troy State University. She holds memberships in Phi Kappa Phi, Sigma Xi, the Oceanography Society and the American Meteorological Society, among other professional organizations.

# What does it mean to receive an invitation from a tree? Considering the phenomenology of forest therapy

**Chris Goto-Jones**

University of Victoria

## **Keywords**

Phenomenology, Experience, Subjectivity, Philosophy, Attention

## **Abstract**

Much contemporary research into forest therapy aims at establishing an empirical evidence-base for its therapeutic efficacy. This work is extremely important and helpful today. However, in this evolving context, some forms of empirical evidence are often marginalised or overlooked: what is the actual experience of being in the forest in a therapeutic context and what does that experience mean to the people involved? Hence, drawing on European Continental Philosophy, Asian Philosophical Traditions, and phenomenological psychology, this paper seeks to address the phenomenological side of forest therapy.

Making use of first-person accounts from numerous sessions in the forest, it considers such questions as: What does it mean to participate in forest therapy? How does a forest therapy guide receive an invitation from the forest? What does it feel like to be held in the forest as a therapeutic space, either as a client or as a guide? What does it even mean to feel like we are in forest therapy and not simply in a forest with some friends? The answers to these questions revolve around issues of intentionality, awareness, attention, and trust.

An intriguing preliminary conclusion suggests that an important aspect of the forest therapy experience is the recognition of the radical particularity of the beings around us. At first glance, this seems to contradict the frequently-observed feeling of unity and merging with the forest, but in fact recognition of the particularity of, say, a specific tree or rock or stream, emerges as a vital experience that may be one of the conditions for the possibility of forest therapy.

# Experiencing connection with nature in the forest

**Shawn Slade**

Western University

## **Keywords**

Connection with Nature, Forest Experience, Well-Being, Phenomenology, Health Promotion

## **Abstract**

Connection With Nature (CWN) is an individual's subjective sense of oneness with the natural world. The concept has primarily been studied using survey-based methods and is regarded as a relatively stable personality trait. Research shows nature connection experiences and activities enhance well-being, and trait levels of CWN fluctuate after immersive nature experiences, such as forest therapy. Ecopsychology theory and practice have benefited from CWN scholarship, however, a quantitative and trait-based approach to studying CWN does not provide a deeper understanding of the nuances and unconscious processes of experiencing this phenomenon.

This qualitative study aimed to explore the experience of CWN in the forest setting and what this experience means to health and well-being. This study utilized two semi-structured interviews to collect descriptive data of this experience with 10 participants residing in Ontario, Canada, who identify as valuing CWN in the forest for their health and well-being. The first interview took place on Zoom, and the second interview was in a forest setting of the participant's choice. All interviews were audio-recorded and transcribed verbatim in accordance with Interpretative Phenomenological Analysis, the methodology engaged in for this study. The primary investigator carried out data collection and analysis. To enhance the credibility of the findings, participants were provided with a summary of their personal themes to reflect on prior to the second interview, and a member of the research team performed an audit check on three transcripts. A table of personal experiential themes was created from the analysis for each of the 10 participants. Cross-participant analysis has not yet been carried out for this research.

This presentation will offer the preliminary findings of this study through discussion of the personal experiential themes and briefly highlight what the experience of CWN in the forest means to participant's health and well-being.

# The additional benefits of a one-hour Solution-Focused Brief Therapy session in an urban forest on student wellbeing and behaviors: A three-armed randomized controlled trial

**Jolanda Maas**

The Vrije Universiteit Amsterdam

## **Keywords**

Positive Psychology, Students, Urban Forest, Walking Therapy, Well-Being

## **Abstract**

There is increasing interest in both the beneficial effects of providing therapy in nature and in supporting student mental wellbeing.

Primary aim of this study was to investigate whether a one-hour session of Solution-Focused Brief Therapy (SFBT), provided by a trained clinical psychology master student while walking in a natural environment, is more effective in stimulating students' wellbeing and behaviors than a similar session provided while sitting indoor or while walking in an urban setting. Secondary aim was to investigate whether the setting in which SFBT session takes place influences therapeutic alliance and quality of the session.

A total of 121 university students were randomized to the nature ( $n = 38$ ), urban ( $n = 43$ ) or indoor ( $n = 40$ ) condition. Main outcomes were general mental health, self-efficacy, procrastination, and goal attainment measured one day before the SFBT session and two weeks after the SFBT session. Secondary outcomes were therapeutic alliance and quality of the session measured on the day of the session. Data were analyzed using multiple regression analyses.

Preliminary results show that the one-hour SFBT session significantly improved general mental health, self-efficacy and decreased procrastination. No significant differences were found between the three conditions for general mental health, self-efficacy, procrastination and therapeutic alliance. Goal attainment was significant higher in the nature condition (67%) compared to the indoor (59%) and urban condition (57%). The session in the nature condition was also rated significantly higher on enjoyableness and on perceived restorativeness.

Providing a one-hour session SFBT for students might be an interesting intervention to put into place to support students' wellbeing and behaviors. Some first indications were found for the additional benefits of providing SFBT in nature.

# Natural sounds of forests vs. favorite music: Which is more beneficial to reducing people's weekly perceived stress?

**Yasushi Suko**

Tampere University

## **Keywords**

Natural Sounds of Forests, Stress Reduction, Perceived Stress Scale (PSS), Well-Being, Music

## **Abstract**

Listening to natural sounds of forests (e.g., birdsong) and preferred music is claimed to reduce people's perceived stress, but which is more effective has not been revealed. This study aimed to compare the effect of natural sounds on mitigating people's perceived stress with that of music. Ninety university students participated in an online experiment lasting 14 days. Half of the participants listened to natural sounds for 10 minutes every day during the first week. Then, they listened to their favorite music for 10 minutes during the second week. The other half listened in reverse order. Each participant filled out a questionnaire - the Perceived Stress Scale - on Days 1 (baseline), 8 (for the first week), and 14 (for the second week). In this experiment, we mainly used natural sound clips extracted from the Cyberforest Database, an online archive of natural sounds recorded in Japan's forests since 1995. The results showed that, compared to the baseline week, participants experienced significantly less stress only in the week of natural sounds. The results suggest that natural sounds may be more beneficial than music in reducing people's weekly perceived stress and enhancing their well-being.

# A structured forest therapy intervention enhancing the nature connectedness and psychological well-being of U.S. veterans with PTSD, families, and volunteers

**Namyun Kil**

University of Wisconsin-La Crosse

**Keywords**

Forest Therapy, Nature Connectedness, Mood States, Psychological Well-Being, Life Satisfaction

**Abstract**

Forest therapy has recently received growing attention as an outdoor therapeutic intervention for individuals without special needs. However, it is not established whether a structured forest therapy intervention enhances nature connectedness, mood states, and satisfaction with life of veterans and families. This study explored the nature connectedness, mental health and well-being benefits of structured forest therapy interventions for U.S. veterans with PTSD, family members, and volunteers. A one-group pretest-posttest design was performed for the intervention facilitated with the individuals in September 2019, May 2021, and May 2022. A total of 53 participants were recruited (veterans with PTSD 32%, family 51%, and volunteers 17%). The participants engaged in a standard sequence of slow, mindful sensory connection invitations employed by a certified forest therapy guide. A questionnaire with Connectedness to Nature Scale, Profile of Mood States, and Satisfaction with Life items were administered to the participants before and after the structured forest therapy intervention to measure nature connectedness, and human health and well-being benefits. Results showed that nature connection was significantly improved after the forest therapy intervention. Negative mood states (i.e., anxiety, depression, anger, fatigue, confusion) decreased significantly after the forest therapy intervention, and a positive mood state (vigor) was significantly improved after the forest therapy intervention. In addition, satisfaction with life was significantly enhanced after the intervention. The results demonstrate substantial nature connectedness, and human health and well-being outcomes of structured forest therapy for veterans with PTSD, family members, and volunteers and verify the evidence-based practice of structured nature immersion interventions for similar clients.

# Exploring the role of forest therapy in healthcare chaplaincy

**Kimberly Knight**

Association of Nature and Forest Therapy

**Keywords**

Chaplaincy, Pastoral Care, Eco-Spirituality, Religion

**Abstract**

As representatives of various traditions, chaplains in hospitals and medical centers draw on the wisdom and practices of psychology, religion, spirituality, and secular therapy to serve patients, families and staff in facilities across North America and Europe.

Although chaplains are rigorously trained and certified to support people of all (and no) religious faiths, there is little to no emphasis placed on the role of nature in caring for the spiritual, mental and physical health of patients.

This presentation by a CPE-trained caregiver and ANFT-certified Forest Therapy Guide is an exploration of the potential and benefits of integrating nature and forest therapy in the field of clinical pastoral education and the professional practices of chaplains in the healthcare sector.

# Integrating nature in post-concussion treatment

**Sus Sola Corazon**

University of Copenhagen

## **Keywords**

Mild Traumatic Brain Injury, Nature Therapy, Sensory Training

## **Abstract**

Post-Concussion Syndrome (PCS) is defined as persistent symptoms after a concussion, in which mental fatigue, attention difficulties and sensory disturbances are dominating. It increases the risk of co-morbidities and reduced quality of life. Usually the treatment takes place indoor entailing sensory training, physical, cognitive and occupational therapy.

As restorative natural environments generally are enriched with sensory stimulation and possibilities for restoring depleted mental resources. We wanted to investigate if Naturebased Therapy could be suitable for ameliorating the symptoms experienced by people with PCS. An eight-week trial showed positive results, and the project is now expanded to a larger trial. It will take place in the Forest Therapygarden Nacadia located in Denmark's largest arboretum.

Nacadia is specifically designed to promote health and well-being. In the garden you are gently submerged in diverse sensory stimulations and various possibilities for activities and levels of social interaction, which will be integrated in the PCS treatment.

Nacadia has been used in several research projects with different patient groups including an RCT trial on treatment for stress-related disorders.

We will present the results from the pilot project and introduce you to the Forest Therapygarden and its Nature Based Therapy Concept, illustrated by examples from the PCS treatment.

# Taming the anxious brain with nature in mind

**Heidi Schreiber**

Center for Nature Informed Therapy

**Keywords**

Anxiety, Nature Informed Therapy

**Abstract**

Nature-informed (psycho)therapy explores nature-based methods of psychological healing, grounded in the belief that nature has profound mental health effects specifically for anxiety and stress related mental health challenges. This workshop will provide introductory knowledge of neuroscientific concepts of anxiety as well as nature-based strategies and exercises designed to successfully manage emotional de-regulation. This topic is particularly relevant as many individuals struggle with an uptick in anxiety in the aftermath of the Covid-19 epidemic.

# Forest therapy group intervention and guiding skills for exhaustion disorder, anxiety and depression

**Petra Ellora Cau Wetterholm**

Scandinavian Nature and Forest Therapy Institute

## **Keywords**

Clinical Forest Therapy, Nature Based Therapy, Stress Related Disorders, Forest Therapy Guide Skills, Mental Health

## **Abstract**

*Background:* Forest Bathing has been scientifically suggested as a nature based, preventive health care intervention to lower stress levels and strengthen the immune system. These are two major findings that account for several positive health and wellness experiences, physiological as well as psychological. However, the professional Forest Therapy guide training methodologies are aimed at non-clinicians and target mainly preventive, wellness interventions. This presentation aims at presenting a clinical Forest Therapy study in Primary Mental Health Care, as a bases for possible methodological development, clinical skills application, new venues of training and future clinical use.

*Method:* This was a mixed method feasibility study, using quantitative and qualitative research measures. It assessed the outcome of a six week, manualised, guided clinical forest therapy group intervention in primary mental health care, for adults diagnosed with exhaustion disorder, stress, anxiety and depression. The study also investigated possible guiding skills adjustments in order to enable clinical patient participation; to support symptoms and specific needs of participants suffering from burnout syndrome and related difficulties.

*Result:* The qualitative results indicated lower levels of perceived stress, anxiety, and depression during and immediately after a forest therapy session, lasting up to three days. Results regarding guiding skills development were adjustments and compensations regarding cognitive impairments, sensory hypersensitivity, excessive worry and hopelessness, social withdrawal, emotional overwhelm, overactivity, lethargy, physical pain and tinnitus.

# Significance of forest therapy in the rehabilitation of patients with post-COVID conditions

**Melanie Adamek**

IM-WALD-SEIN Institute for Forest Medicine and Forest Therapy

## **Keywords**

Forest Medicine, Forest Therapy, Complementary Medicine, Medical Rehabilitation, Post-COVID Syndrome

## **Abstract**

During Corona pandemic restrictions, forests in Germany experienced a renaissance as a destination for individual excursions. Urban forests in particular are an important resource in crisis situations. However, forests become relevant in the context of complementary medicine measures for the prevention and therapy of various diseases.

At Sana Rehabilitation Clinic Sommerfeld, patients have been rehabilitated after severe corona infections since April 2020. Patients with typical symptoms of Long Covid Syndrome have been treated since 2021. Physical therapy, dosed endurance training on the treadmill with and without oxygen, targeted chest massage and outdoor therapy are elements of this treatment concept. As a traditional pulmonary sanatorium, Sommerfeld has a rich experience in forest therapy. Since 1914, tuberculosis patients have been treated in forest halls and with dosed terrain cures. Now it is important to adapt these established treatment methods to today's requirements and new patient groups.

The presentation gives an insight into an outstanding cooperation project between IM-WALD-SEIN® Institute for Forest Medicine and Forest Therapy and Sana-Clinics Sommerfeld, with which forest therapy is to be adapted as a naturopathic treatment for medical rehabilitation and shows the relevance of the IM-WALD-SEIN method in the context of the therapy of Long COVID conditions.

# Natural therapy through the nature, health and culture program of the JBB

**Paola Liliana Rodriguez**

Bogotá Botanical Garden

## **Keywords**

Cuidado, Terapias de Naturaleza, Terapéutico, Política pública, gobierno local

## **Abstract**

The program seeks to reconnect citizens with nature and promote sensory environmental practices, allowing the creation of a culture of care, well-being and good living, and contributing to the conservation of ecosystems and the preservation of the health of the citizens.

Due to the modern urban, sedentary, highly technological and rushed lifestyle, society in general could be suffering from Nature Deficit Syndrome, which although it is not a medical diagnosis, it does reflect and can co-explain the problems that as a society we have not just in terms of an increase in chronic, autoimmune and degenerative diseases, but especially on mental health, where one of the possible causes could be having distanced ourselves from the nature of which we are part.

In a parallel way, we have a high level of environmental deterioration and a great need to restore and conserve our ecosystems, and that is why the JBB is presenting with this program which is based on both foresting experiences, strategies that help to “regreen” the hearts of citizens, reestablishing broken relationships with nature and in that process, highlighting the powerful therapeutic effect that nature has to counteract our emotional and physical stress, and increase our wellbeing. This through the implementation of environmental education strategies, the integration of sustained and conscious contact with nature into public health policies, the promotion of the prescription of nature and vitamin N, the development of research projects that evaluate the therapeutic effect of nature, and for most, the design and offering of Forest Therapies (with ANFT certified guides) and other forms of Nature Immersions, both in the garden and in metropolitan parks and other natural areas of the city, reaching so far more than 8,000 of the 20,000 that we have as our goal.

# International forest therapy days as learning community

**Katriina Kilpi, Vitalija Povilaityte-Petri**

International Forest Therapy Days

## **Keywords**

Forest, Health, Community, Wellbeing, Learning Community

## **Abstract**

International Forest Therapy Days (IFTDays), established in 2018, is an initiative focused on forest-based health practices, exploring the mindful connection with nature, specifically forests, for wellbeing and health. The first, week-long meetings of IFTDays took place in 2018 and 2019 in Finland and consisted of a seminar day and of a practical, immersive part. In 2020 due to pandemic restrictions, the event was held online as a 3-day-event, with speakers and live streaming of live workshops.

IFTDays goal is to be a platform for various viewpoints, different types of knowledge, and a diversity of nature relationships where new ways of approaching and solving the collective and individual wicked problems, are co-created. When COVID-19 forced the event online, the community had to rethink its mission and goals. Soon monthly online circles were launched, based on sharing and mutual learning. These circles have since 2021 covered a wide range of relevant topics in order to support each other and share new emerging experiences around commonly interesting nature connection questions.

Today the IFTDays continues to bring together practitioners, scientists, and policymakers. IFTDays continues to promote exchanges of experiences using different approaches to forest-based wellbeing and health research, and practices with diverse client groups and forest environments.

The availability and diversity of online platforms allow people and forests to meet in different ways. Even if the world opened, the online meetings remained a way to bring global community members together to reconnect on a regular basis. In times of facing losses, transformation, and crisis, IFTDays' on-lines circles discovered their new vocation as a global learning community that experiences the magic of healing in sharing, learning, and being together in virtual and local forests. IFT Days remains open to respond to the community's changing needs and to the constantly changing field of forest-based health practices.

# Ecosystem repair through embodied connection, and building credibility in a growing industry

**Romola Porchuk**

Global Institute of Forest Therapy (GIFT)

## **Abstract**

Forest Therapy is a growing field within the landscape of healing modalities. The broader context in which Nature Connection occurs is in service of the notion of ecological repair: Healing our separation and that which disconnects us from ourselves, each other, and the more than human world. Nature Connection invites the work of reconnection in a gentle, integrated, and non-invasive way. While we deeply acknowledge that nature is the healing environment, the gateway is the guiding practice. Beyond the method, it is perhaps important to look at the foundations of guiding. Embodied practice invites a standard from which the work is both ethical and grounded. This is a new and growing industry and it will be important as research and credibility is built, to create safety, and perhaps international standards into the training landscape as we move forward.

# Sensing the forest: Participatory trail assessment

**Tara Brown**

The University of British Columbia

## **Keywords**

Forest Bathing, Forest Therapy, Citizen Science, Environmental Monitoring, Ecosystem Services

## **Abstract**

Nature and forest-based interventions have been increasingly the focus of medical research and public health as a preventative and promotional health practice. Humans intuitively feel that being outside in nature is beneficial for their health (Kaplan & Kaplan, 1989); however, evidence shows this is not uniformly true (Eisenman et al., 2019), and researchers have noted limitations in understanding individual differences in responding to nature (Joye & van den Berg, 2011). Research in S Korea uncovered that health effects vary between geographic locations and forest types (Yeon et al., 2021). Forest therapy bases have been established across Japan to provide preventative health benefits. Suitable forests are assessed using a trademarked rigorous process that includes clinical trials to measure the health effects of forest therapy on chosen trails. Other forest therapy groups, such as The Association for Nature and Forest Therapy, provide commercial services to certify trails. There are practical and economic benefits to providing trail certification, yet there is also an opportunity to involve the public in assessing and monitoring the trails they regularly spend time on. Forest air, sound levels, light levels, and microclimates are dynamic ecosystem service resources for health-promoting effects in the forest (Iijima, 2014) and directly impact the effects of forest bathing. However, they are not consistently or universally monitored. My dissertation research is monitoring environmental conditions while volunteers are forest bathing. It is a tedious and challenging process. Through hands-on activities, citizen science provides an opportunity for the public to understand the dynamic nature of forest environments in relation to their health and contribute to crowdsourced data collection. This talk will discuss the main objectives of the project to collect environmental data on forest trails, the methods of using smartphone apps to replicate fieldwork measuring abiotic factors, and an open science framework to publicly share the data.

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# The role of guided forest therapy for healthcare professionals

**Ronna Schneberger, Susan Abookire**

Nature and Forest Therapy of Canada, Harvard Medical School

## **Abstract**

When BC Parks Foundation proposed the roll out of their Park Prescription program, November 2020, I suggested the offer remotely led forest therapy walks to support exhausted healthcare workers. They loved the idea so I, along with another guide, led weekly walks for BC healthcare workers. On all occasions they were grateful for the break, some where in tears as they released the pent-up tension and grief, others commented they felt they were in another world away from smell and touch, they commented how nice it felt to be back in their bodies in the present moment feeling at ease.

At the same time Dr. Susan Abookire, an associate professor at Harvard Medical School and a Forest Therapy guide trained by the ANFT (my mentee) was leading walks, for a small research project, to see if guided Forest Therapy could help prevent doctor burn out. The results were promising so she is starting a larger study looking into what a proper prescription would entail to help doctors prevent or recover from exhaustion. Together, we have led a couple of courses introducing forest therapy to healthcare professionals. Many of these folks have signed up to become certified Forest Therapy Guides.

Lastly, it's important to look at the role of the guide in delivering forest therapy for healthcare professionals. Guides use proven techniques to help participants slow down in a way that would be difficult to access on their own, given how exhausted they are. By using a standard sequence, guides create a concentrated experience so clients can receive maximum benefits in a short amount of time.

# Study on perceived health benefits of landscape features in giant Panda National Park under audio-visual interaction

**Chengcheng Zeng**

Zhejiang A&F University

## **Keywords**

Audio-Visual Interaction, Trail Landscape and Vegetation Density, Integrated Sound Environment, College Students, Physical and Mental Health

## **Abstract**

Vision and the auditory sense, as important forms of environmental perception, are indispensable and cannot be ignored in environmental experience. Trail landscape is an important infrastructure in national parks and other natural areas and is the main carrier to assist visitors to develop environmental perception experience. However, there are few studies on the health effects of trail landscape features under the audio-visual interaction. In this study, 360 college students were recruited as subjects and randomly assigned to 12 groups (N=30) with vegetation density (VD), an important structural index of visual landscape features, and integrated acoustic environment (ISE), a characteristic element of landscape features. The subjects first performed the same 5-minute high-pressure learning task in the indoor environment, and then watched and listened to the pictures and audio of the combination of vegetation density and sound environment of the trail landscape for 5-minute recovery activities. The physiological and psychological responses of college students under the perception of audiovisual interaction were analyzed by EEG device and psychological questionnaire. The results show that when the sound condition does not correspond to the natural vegetation density, there may be an adverse physiological response. The same combination of vegetation density and sound condition can obtain a better psychological antihypertensive effect. The analysis of the characteristics of the trail landscape, especially the visual and auditory perception, can more objectively understand the favorable elements of the national park trail landscape design, and provide scientific support for the trail landscape construction based on health benefits.

# Evolution of research in Forest Therapy: Lessons from evidence-based mindfulness practice

**Ernest Chi-Hin Ng**

The University of Hong Kong

## **Keywords**

Forest Therapy, Research Themes, Mindfulness, Evidence-based, Well-being

## **Abstract**

Over the last few decades, research on Forest Therapy offered encouraging supports for the physical and mental benefits of participants. Some results indicate positive impact on well-being: physiological health, mental health, and emotional and psycho-spiritual health. There were also some efforts analyzing the causes of these positive impacts, linking some of these benefits to different factors (Phytoncides, immune system, and Natural Killer cells) and different theories. These studies lead to further interest from the community, allowing for a larger population of participants and more in-depth analyses over a longer period across different regions. This paper attempts to briefly review the current state of research in Forest Therapy with a focus on understanding the evolution of different research themes over time. Based on this analysis, this paper tries to draw insights from the mindfulness movement and present some of the major phases of research in evidence-based mindfulness practice over the last 50 years since 1970s. Some of the major research trends on evidence-based mindfulness could be relevant to the research in Forest Therapy and perhaps inspire some potential directions for future research. It is also valuable to learn from the mindfulness research about what works and what does not. This paper concludes with some recommendations on potential themes and pitfalls for future research, and implications on training and development in Forest Therapy.

# Forest therapy theory & practices in SXAU

**Zhiling Wang**

Shanxi Agriculture University

## **Keywords**

Forest Therapy, Shanxi Agricultural University, Expressive Art Therapy, Threefold Representation

## **Abstract**

Shanxi Agricultural University (SXAU) has been offering classes in forest therapy since 2020. The development of forest therapy theory and practise in China, the government's strong policy and financial support, and the attempt by the forestry department at SXAU to establish a forest therapy base in Zhanghe village were the three main factors that led to the establishment of this professional direction. Students in the forest therapy class have participated in nature education, environmental monitoring and other practical tasks during the previous two years in addition to their usual studies, giving them extra opportunities to develop their skills. Here we introduce a program we conducted recently.

We tried to combine forest and expressive art therapy together to assist women in releasing their emotions. With all the preparations completed, the women were instructed to open their senses in a peaceful and comfortable forest. After that, graffiti & meditation, tearing off the paper and reconstructing were used as threefold representation to release their emotion. Classical dancing was then applied as exercise therapy to help the ladies stretch and unwind. The findings indicated that while this plan for forest therapy was effective in helping depressed women to some extent, some particular instances required further follow-up resolution strategies.

Currently, several teachers and master students have participated in the forest therapy initiatives that we have started. I anticipate that more fascinating findings will be revealed in the future, and that forest therapy will advance in Shanxi, China.

# Comparison of the mindfulness meditation interventions on college students' emotions and attention in different environments

**Xiang-Fei Gong**

Fujian Agriculture and Forestry University

## **Keywords**

Mindfulness, Meditation, Stress, Health, Stress Management

## **Abstract**

After the outbreak of the COVID-19 pandemic, university students experienced stress-related health conditions, due to restrictive measures to restrain face-to-face communication, causing university students to disconnect from social relationships, leaving them feeling lonely and stressed. On the other hand, the transformation from in-person teaching classes to online classes in the educational environment had a detrimental impact on students, such as poor academic quality, unhappiness, and life dissatisfaction.

Under this circumstance, mindfulness meditation has been practiced to be a novel approach to improve health and well-being, manage people's stress and negative thoughts. The primary purpose of this study was to identify: (i) whether mindfulness meditation intervention in forest and indoor environments can affect the health of university students; (ii) whether the therapeutic effect differs depending on the environment.

A total of 109 university students (49 females and 60 males) participated in this study. The volunteers were divided into three separate groups randomly and were assigned to conduct a one-hour per day mindfulness meditation intervention during two weeks in one of two environments. The autonomic nervous system activity was measured using heart rate variability(HRV), heart rate(HR), and blood pressure(BP). The Profile of Mood States(POMS) and Five Facets Mindfulness Questionnaire(FFMQ) were used as psychological indicators. This study showed that the concentration of self-attention is more significant when in the indoor environment than in a forest, which may be due to the absence of noise and distraction in an indoor room. However, participants in the forest environments showed more stress reduction, depressive and anxious symptoms reduction, and enhancement of positive emotion than in the indoor environments. This study suggested a possible beneficial value of a short 2-week mindfulness meditation intervention, particularly for contemporary people with limited time in the post-pandemic era.

# Forest Therapy: The missing link between biophilic design and the built environment

**Nicole Craanen**

Independent Practitioner

## **Keywords**

Biophilia, Design, Architecture, Forest, Sustainability

## **Abstract**

As an interior designer, WELL-AP and NCIDQ with a Master's of Fine Arts degree from UW-Madison in Human Ecology I have a focus on environment & behavior and biophilic design. I have worked in s as an interior designer including in healthcare, served as an adjunct lecturer at UW-Madison, as a speaker on biophilic design, and in a consulting role to local and international organizations. I also run my free educational website [www.rootedinnature.org](http://www.rootedinnature.org) and am currently training to be a Forest Therapy Guide through ANFT.

Forest Therapy is about both the relational connection between humans and nature as well as the health benefits from this connection. Biophilic Design is the application of this human-nature connection to the built environment.

When presenting on biophilic design, there is often a disconnect between attendees' interest in research and a personal understanding of their nature connection. In my presentation, I will introduce the concept of running architectural forest therapy and biophilic design visioning sessions and design workshops by partnering with the owner and related experts.

The aim of these workshops is to address the entirety of the sustainability model's 3-Legged Stool approach with these main goals:

- People - Draw awareness of the benefits for people that use those spaces from a health and well-being perspective.
- Planet - Connect attendees to the world around them in hopes that this might foster changes in the way they see our human impact and increase environmental stewardship.
- Profit - Increase physical and mental health, fewer sick days for employees, increase recruitment, retention, and productivity.

An approach such as this allows us to maintain our fiscal responsibilities while symbiotically accepting the responsibilities of continuing to preserve the mental and physical health of fellow human beings all while ensuring the environment will continue to sustain us.

# Forest therapy of korea and cases of forest therapy integrated with public policies

**Chang-Hyou Kim, Ka-Yeong Oh, Woo-Jin Lee \***

Korea Forest Welfare Institute

## **Keywords**

Korea Forest Welfare Institute, Forest Welfare, Forest Therapy, Forest for Human Health

## **Abstract**

The pandemic of COVID-19, abnormal climate change, and frequent natural disasters have made the interest in nature's psychological and physiological healing effects on humans. The perceptions of forests and forest activities are not just limited to "resources" but are changing to "positive benefits for human health and life." Korea has succeeded in the forestation of the bare forests for the past half-century. Korean people recognize forests as service resources for culture, recreation, education, and healing. As a result of the success in forestation, The Korea Forest Welfare Institute (FoWI) was established in 2016 and aimed to provide forest welfare services to the public. FoWI operates 16 affiliated forest centers and an R&D center. The mission of FoWI is the 'G7 program specialized by life cycle (birth-infant-adolescence-adolescence-old age-adolescence)' so that all people can enjoy welfare in the forest equally. In addition, forest welfare services funded by the 'Green Lottery Funds' are provided for the vulnerable. FoWI makes indoor and outdoor green spaces in social welfare facilities, installs a barrier-free path for disabled people, provides the 'Forest Welfare Voucher System,' and offers 'Forest Experience Education Programs' for the underprivileged. In addition, FoWI makes efforts to implement Forest Therapy into the health care field. During the COVID-19 pandemic, the 'Forest Care Support Project' for COVID-19 response workers, including medical staff, was conducted. FoWI continues to provide welfare services for the elderly, such as operating the 'Anti-aging Forest Therapy Program' and 'Healthy Life Supporting Program.' Furthermore, FoWI strives to improve human health through Forest by combining high-tech technologies, such as establishing a platform for exercise prescriptions based on forest trails.

# Construction theory and practice of healing garden based on anxiety relieving function

**Lei Yao**

Shanghai Jiao Tong University

## **Keywords**

Healing Garden, Behaviors, Anxiety Relief, Aromatic Plant, Evaluation

## **Abstract**

The aim of this study is to explore the methods and effectiveness of building a healing garden with tension and anxiety relief functions for people who are under the pressure of work and study. We have planned a healing garden (1.6 hectares) for this purpose. This garden is located in Jinshan District of Shanghai, China. It is far from the city center, quiet, and surrounded by idyllic scenery. A series of behaviors were designed for visitors to relieve their anxiety and stress. After visitors enter the garden, walking slowly or fast, watching fish, communicating and pouring out feelings, and meditating will happen in turn according to the designed tour route. At the same time, through the construction of landscape and roads, private places to talk and communicate, light sports places and meditation areas were created. Such design concepts will help visitors alleviate stress and anxiety through the experience of different activities in steps. In addition, aromatic and medicinal plants with different healing functions were arranged for different activities area. Finally, the effectiveness of the healing garden will be evaluated in volunteers by testing physiological indicators before and after entering the garden.

# Digital twin based forest therapy

**Annie Wang**

VisionX

## **Keywords**

Forest Bathing, Digital Twin Intelligence, Big Data Modeling, Virtual Forest Therapy

## **Abstract**

Contemporary forest healthcare lacks scientific and quantitative understanding, and has not really explored the beneficiaries of the natural forests in depth. Our team proposed the novel concept of digital twin empowerment of forest related health care. Based on the original All Element Scene, digital twin intelligence integrates satellite remote sensing, physical, chemical and biological simulation, industrial simulation, artificial intelligence, cloud computing and other technologies to establish a digital twin application ecosystem. The digital twin intelligence platform can better realize all-round spatial information, all-element sensing and cloning presentation of the physical world, and support the scale restoration of forest environment groups, all-element scenes, multi-sensory simulation, software and hardware platforms, collaborative service innovation of practice home forest therapy. Through this multi-information fusion technology, we can accurately measure the spatiotemporal dynamic distribution of plant essence and phytoncide in different forests, and use big data analysis to build a dynamic digital forest that is bolstered by scientific model validity. In order to achieve the sustainable and healthy development of the forest healthcare industry, we have further developed virtual and augmented reality services for forest therapy and household phytoncide derivatives. Virtual therapy plans integrate data collected from intelligent monitoring of forest by satellite remote sensing (macro), aerial remote sensing by UAV (regional), all-weather intelligent monitoring on the ground (micro), and quantitative modeling of intelligent sensing of full-paradigm forest (forest phase). Forest facies analysis and big data modeling of forest bathing are used for the standardization and customization of scientific wellness plans to individual customers.

# Certification of healing forests and the elaboration of European standards

**Anne Rabes**

BioCon Valley GmbH

## **Keywords**

Healing Forest, Certification, International standards

## **Abstract**

*Objective:* Forests have a considerable potential in disease prevention and public health promotion. The research evidence regarding healthy adults is already relatively strong, but there is little evidence on the effect of forests on disease recovery. We suppose that treatments in the forest, accompanied by trained therapists, are suitable to positively influence the treatment of diseases as well as the extent of disability caused by these diseases. However, in order to use the forest as a therapeutic space, the forest should possess certain characteristics. Our aim was to develop a standardised protocol to assess the suitability of the forest for therapeutic use.

*Design and Method:* We have defined a set of criteria and standards to assess whether a particular forest is suitable for the treatment of diseases. The verification of these criteria is carried out by independent experts and results in awarding a "Healing Forest" certificate. The certification is based on (i) a therapeutic concept of use, which provides general information on the forest area and the planned therapeutic offer, (ii) a forestry report, which examines the currently existing forest stands, their management, and the existing infrastructure, and (iii) a medical report, which assesses the health-promoting effect of the forest. The reports are prepared within the framework of an on-site visit.

*Results:* A standardized certification procedure has proven to be a suitable method to verify the suitability for therapeutic use of forests. So far, three "Healing Forests" have been created in the federal state of Mecklenburg-Western Pomerania, Germany. We are currently preparing the certification of two more "Healing Forests" in Austria, Portugal, and Lithuania which shows that the developed approach is also applicable internationally. Regarding the location of a "Healing Forest", the proximity to a hospital as well as to health or rehabilitation centers has proven to be advantageous.

*Conclusions:* Further scientific studies are needed to prove the effectiveness of "Healing Forest" therapy. The "Healing Forest" certificate can help to establish international standards for the creation of "Healing Forests" and to promote conducting of further controlled studies. Moreover, certification ensures compliance with high-quality standards and creates confidence in the professionalism of nature-based therapies. This could contribute to a greater recognition of the importance and potential of forest medicine for disease prevention and therapy by public health care systems in Europe.

# Forest therapy effects on the blood pressure and salivary cortisol levels of urban residents: A meta-analysis

**Quan Qiu**

University of British Columbia, South China Agricultural University

## **Keywords**

Forest Therapy, Blood Pressure, Salivary Cortisol, Urban Resident, Meta-Analysis

## **Abstract**

Accelerated urbanization poses health challenges to urban population, such as hypertension and mental stress. As an alternative medical measure, forest therapy has shown the effect of normalizing blood pressure (BP) and reducing stress from increasing literature recently, but it is still inconclusive. In order to systematically verify forest therapy's effects on BP and mental stress of urban residents, we conducted meta-analyses to assess the changes in systolic blood pressure (SBP), diastolic blood pressure (DBP), and salivary cortisol concentration (SCC; a stress biomarker) between forest therapy group and urban control group. Using meta-analysis, the mean difference estimates indicated that forest therapy significantly reduced participants' SBP  $-3.44$  (95%CI  $-5.74, -1.14$ ), DBP  $-3.07$  (95%CI  $-5.59, -0.54$ ), and SCC  $-0.07$  (95%CI  $-0.10, -0.04$ ), as compared with urban control. Yet, there was substantial heterogeneity ( $I^2 = 72.87-88.59\%$ ) among these studies. Meta-regression analyses showed that participants' age and baseline SBP levels determined the heterogeneity among SBP studies. After forest therapy, older participants and those with higher baseline SBP levels had greater SBP-lowering effects. Among DBP studies, the primary source of heterogeneity was participants' baseline DBP levels; participants with higher baseline DBP levels had greater DBP reduction. In subgroup analyses, we discovered that longer-term forest therapy programs ( $\geq 20$  minutes) resulted in a greater reduction in BP and SCC than shorter-term forest therapy programs ( $< 20$  minutes). Additionally, seated viewing, walking or multi-session programs in forests were observed to have similar effects on reducing BP and SCC. Despite extensive analyses, the study did not identify any sources of heterogeneity among forest therapy programs for lowering SCC levels. Overall, we conclude that forest therapy programs have beneficial therapeutic effects on urban residents' physio-psychological health through lowering BP and relieving stress (reducing SCC). This finding provides solid evidence of the contribution of forest therapy to urban resident's health and wellbeing.

# An empirical study on the effects of forest convalescence on the human physiological and psychological health

**Yaoyao Gao**

Jiangxi Agricultural University

## **Keywords**

Terpenes, Human Health, *Phyllostachys Edulis*, *Cryptomeria Japonica*, *Cinnamomum Camphora*

## **Abstract**

The effects of plant release of terpenes on human health are reflected in psychological and physiological responses or indirect effects on human health through the environment. From October 2018 to October 2019, *Phyllostachys edulis*, *Cryptomeria japonica* and *Cinnamomum camphora* were studied in Nanchang Botanical Garden. The following conclusions were drawn: (1) The monoterpene release concentration of *Cryptomeria japonica* was significantly higher than that of *Phyllostachys edulis* and *Cinnamomum camphora* ( $P < 0.01$ ), while the sesquiterpene release concentration of *Cinnamomum camphora* was significantly higher than that of *Phyllostachys edulis* and *Cryptomeria japonica* ( $P < 0.01$ ). (2) The concentration of terpenoids released by *Phyllostachys edulis* reached its peak in summer and was much higher than that in other seasons. The monoterpene and sesquiterpene release concentrations of *Cinnamomum camphora* and *Cryptomeria japonica* showed low heterogeneity in four seasons. (3) Through PCA analysis, it was found that in *Phyllostachys edulis*, the sesquiterpenes released were mainly Caryophyllene and Ocimene, and the monoterpenes were mainly DL-Limonene and  $\alpha$ -Pinene. Sabinene and Myrcene are the dominant monoterpenes in *Cryptomeria japonica*, while Ocimene and Farnesene are the dominant sesquiterpenes. The distribution of terpene organic compounds released by *Cinnamomum camphora* was relatively balanced. (4) Among the three tree species, there are 2 kinds of unique volatile organic compounds in *Phyllostachys edulis*, 14 kinds of Japanese cedar, and 15 kinds of camphor. Among them, Perillen released by *Cinnamomum camphora* has the effect of inhibiting tumor, and  $\beta$ -Bisabolene released by *Cryptomeria japonica* has the effect of strengthening the heart.

# Current development, challenges and opportunities of Forest Therapy in China

**Lijun Liu**

Forest Therapy Association of China

## **Abstract**

Since the introduction of the international concept and model of forest therapy in 2010, China's forest therapy has developed rapidly, and now it has entered an important stage of popularization and promotion, experimental demonstration and increasing development. The definition of forest therapy in China is a general term for all supplementary and alternative therapy approaches with the effect of health enhancement and disease prevention/curing, which are conducted under the guidance of forest therapists in specific forest environment or with specific forest products that are integrated into relevant natural therapies. The Chinese government has issued many policies to promote the development of forest therapy. The ultimate goal of China's forest therapy is to ensure every ordinary people across the country to enjoy the benefits of forest therapy, which could be included into health insurance program and paid by the government. The Forest Therapy Branch under the Chinese Forestry Society has made useful explorations in the promotion and popularization of the international concept of forest therapy, the construction and planning of forest therapy bases, the promotion of empirical research on forest medicine, the formulation of relevant standards, and the training of professionals, which have achieved remarkable results. In the future, the forest therapy in China will gradually form its own unique mode by strengthening international cooperation and exchanges in the field of forest therapy, in line with China's national and forest conditions and in combination with domestic reality.

# Implementing forest therapy into information literacy instruction

**Kristen Mastel**

University of Minnesota

**Keywords**

Outreach, Libraries, Classroom, Forest Therapy, Curriculum

**Abstract**

Forest bathing and mindfulness can be incorporated into the classroom to reduce student stress and increase engagement in a flexible learning environment. This presentation will review core tenets of mindfulness and how focus, openness, mindfulness, breathing, gratitude, and judgement-free and acceptance are integrated into the classroom through forest bathing. An overview of mindfulness techniques, ecotherapy, and contemplative pedagogy techniques in the library classroom will be presented. Forest therapy has been integrated into the architecture, family social science, public health, and environmental science coursework, along with the mental health services and Extension at this large research university.

# From theory to practice: Delivering forest therapy to the masses

**Philip Hosmer**

Nature Worx, Inc.

## **Keywords**

Scalable, Competitive, Outcomes, Strategy, Growth

## **Abstract**

The value of forest therapy has been proven many times over. Yet, especially in the USA, there remains a struggle to create a market for nature connection as a sustainable business beyond credentialing and academic organizations. One organization that has solved this problem is Nature Worx, Inc., a 501(c)3 founded in 2017 that uses nature connection experiences, including forest therapy, to support people's physical, mental and spiritual health.

This case study will explore how Nature Worx Inc has created a viable business model founded on the idea that nature connection experiences can be delivered directly to the people who need it most by forging collaborative partnerships, developing outcomes data and attracting diverse funding sources.

Nature Worx provides services to substance use disorder patients, teens with behavioral issues, veterans with PTSD, college students, social workers, hospital staff, corporate employees and first responders. Funding streams include corporate donations, grants from trusts, foundations and government agencies, and direct fee-for-service. A diverse team of 20 professional guides with a range of qualifications ranging from professors, teachers, counselors, naturalists, ANFT guides, Outward Bound leaders, and REI employees bring an outstanding ability to facilitate nature connection for program participants. To date Nature Worx has served more than 2,500 participants; 94% have reported positive a reduction in symptoms of depression, stress, anxiety or substance cravings in impact assessment surveys. Their work has been featured in the media and in conference presentations and was recognized by the United Way's Changemaker Challenge.

Philip Hosmer, founder and Executive Director of Nature Worx, will share the story of the organization's success, the challenges they have faced and plans for the future as one example of how to bring forest therapy out of the classroom and into real life paying practice.

# Can I earn a living from forest-based care? Emerging market development in Europe

**Ilaria Doimo**

Etifor srl

## **Abstract**

While the diversity of forest-based care services provides a lot of potential business opportunities, the market is relatively young and not always fully recognized. The lack of a clear overview of the market development results in gaps regarding the understanding and full implementation of FBC. In this research, conducted within the framework of the Erasmus + GREEN4C project founded by European Union, we investigate and provide an overview of the FBC market to provide a better understanding of the advancement and the potential of this sector.

We used an online survey (n=40), to obtain an overview of the FBC sector in Europe, and through focus group discussion and interviews with six experts in the field we explored success factors and challenges.

Overall, the initiatives tend to be small and occasional activities without a regular income. The largest share of customers is the general public, while customers with health issues are difficult to reach due to the lack of formal rules and acceptance issues among health and social care sector. Cross-sectoral collaboration could facilitate the availability of private and public funding and increase the involvement of the public health care sector. Due to the fragmented nature of the market and the lack of a specific and widely recognised supply, a quality assurance system in the FBC activities is lacking.

Our analysis identified three main research areas that could be developed: (i) defining the major benefits and the effectiveness of FBC initiatives compared to traditional treatments, (ii) investigating the cost reduction potential for the health sector and governments, (iii) monitoring and assessing certification schemes. To complement these research points, it is fundamental to implement a clear framing and a systematic approach in the communication and dissemination of the research findings.

# Study on the forest value issues cognition by visitors with different environmental attitudes base on the concept of forest therapy

**Jing Luo, Wei Yin Chang**

Fujian Agriculture and Forestry University

## **Keywords**

Forest Therapy, NEP, Forest Value Issues, Beijing China

## **Abstract**

*Background:* As a significant way to fulfill China's Ecological Civilization Strategy, Healthy China Strategy, forest therapy is of vital importance to high-quality development of forestry. However, there are some troublesome challenges in the development of forest therapy in mainland China. The study aims to analyze the relationship between the environmental attitudes and cognition of forest ecosystem services of people in Beijing so as to provide market-oriented guidance for the development of forest therapy industry in China. As the capital of China, Beijing possesses relatively high population quality, large population mobility and favorable environmental protection awareness, qualifying as the representative of China partly.

*Methods:* Ten major parks in Beijing were selected as research areas with 1048 respondents, and the New Environmental Paradigm (NEP) Scale and Forest value Issues Scale served as data analysis. The respondents were classified into different groups working with SPSS and Two-Step Cluster Analysis. Then we discussed respondents' the perceive level from different environmental attitudes groups on forest issues.

*Results and Conclusions:* The study demonstrates that the score of the overall scale is comparatively high, and people hold a positive environmental attitude. Although there are discrepancies between different groups, people generally highlight more on public forest issues rather than economic issues. The results could provide reference for the national policy implementation of forest therapy, the patterns and construction of forest therapy sites, curriculum designing, theoretical innovation. We should stress public service function of forest ecology, meeting people's health and well-being requirements, promoting sustainable development of forest ecology.

# Practice and improvement: The current undergraduate degree in forest therapy in the Chinese higher education system

**Xin Wang**

Fujian Agriculture and Forestry University

## **Keywords**

Forest Therapy, Policy Suggestions, Talent Development, Discipline Construction

## **Abstract**

The accumulated evidence in the published literature has shown that forest therapy is one of the most convenient and effective ways to improve health, both physically and psychologically. Forest therapy was first proposed by the Japanese Ministry of Agriculture and then introduced to Taiwan in 1983 under the concept of forest bathing. In 2019, four Chinese national departments jointly issued Opinions on Promoting the Development of Forest Health and Wellness Industry to promote the development of forest therapy.

In this study, we first analyzed the development of professional talents worldwide, and then mainly discussed the current status of forest therapists in China. Three organizations were currently in charge of the certification of forest therapists, including Taiwan Forest Therapy Society, China Forestry Industry Federation, and Chinese Society of Forestry. All the training courses included both online learning and offline practice to ensure the participants equipped with both basic knowledge and practical skills at the end of the program.

So far, three universities in mainland China have established forest therapy departments to meet the needs of society, including Fujian Agriculture and Forestry University (FAFU), Beijing Forestry University (BJFU), and Shanxi Agricultural University (SXAU). The courses offered to students included forest therapy-related courses, basic forestry courses, mental health courses, outdoor therapy courses, traditional Chinese medicine, and others. In June 2022, students of the first forest therapy class in FAFU graduated, with over 60% of the students choosing to pursue a master's degree and the rest choosing to work at different forest therapy sites. Challenges and suggestions for further development of Forest Therapy are given considering the rapid development in China.

July 7th, 2022					
	Time	Description	Name	Institution	Talk Title
PM	17:30	Welcome Remarks (UBC)	Dr. Rob Kozak	The University of British Columbia	
			Michiko Martin	USDA Forest Service	
			Shucong Zhao	The National Forestry and Grassland Administration, China	
			Chang Jae Lee	The Korea Forest Welfare Institute	
	18:00	Keynote Speakers	Dr. Qing Li	Nippon Medical School	The secret healing power of nature (forests): From a Feeling to a Science
			Amos Clifford	Association of Nature and Forest Therapy	Forest Therapy: A Ten Year Perspective
		Dr. Melissa Lem	Park Prescriptions	PaRx: A Prescription for Patient and Planetary Health	
		Dr. Won Sop Shin	Korean Forest Therapy Forum	Forest Therapy for Personal Growth and Psychological Well-being	
	20:00	Panel Discussion with Keynote speakers			
	20:30	Intention and Agenda			
	21:00	Adjourn			
July 8th, 2022					
		Description	Name	Affiliation	Talk Title
	8:30	Keynote Speaker	Dr. Kathy Wolf	The University of Washington	Where to Walk? Potential partnerships for forest therapy
	9:00	Research Session AM Speaker 1	Chris Goto-Jones	University of Victoria	What does it mean to receive an invitation from a tree? Considering the phenomenology of forest therapy
	9:20	Research Session AM Speaker 2	Shawn Slade	Western University	Experiencing Connection with Nature in the Forest
	9:40	Research Session AM Speaker 3	Jolanda Maas	The Vrije Universiteit Amsterdam	Behaviors: A Three-Armed Randomized Controlled Trial
	10:00	Research Session AM Speaker 4	Yasushi Suko	Tampere University	Natural sounds of forests vs. favorite music: Which is more beneficial to reducing people's weekly perceived stress?
	10:20	Research Session AM Speaker 5	Namyun Kil	University of Wisconsin-La Crosse	with PTSD, Families, and Volunteers
	10:40	Q & A			
	11:00	Closing Workshop & Final Remarks			
AM	8:30	Keynote Speaker	Matilda van den Bosch	University of British Columbia	Healthy Forests Healthy People
	9:00	Health Session AM Speaker 1	Kimberly Knight	Association of Nature and Forest Therapy	Exploring the Role of Forest Therapy in Healthcare Chaplaincy
	9:20	Health Session AM Speaker 2	Sus Sola Corazon	University of Copenhagen	Integrating nature in post-concussion treatment
	9:40	Health Session AM Speaker 3	Heidi Schreiber	Center for Nature Informed Therapy	Taming the Anxious Brain with Nature in Mind
	10:00	Health Session AM Speaker 4	Petra Ellora Cau Wetterholm	Scandinavian Nature and Forest Therapy Institute	Forest Therapy Group Intervention and Guiding Skills for Exhaustion Disorder, Anxiety and Depression
	10:20	Health Session AM Speaker 5	Melanie Adamek	IM-WALD-SEIN Institute for Forest Medicine and Forest Therapy	Significance of forest therapy in the rehabilitation of patients with post-COVID conditions
	10:40	Q & A			
	11:00	Closing Workshop & Final Remarks			
	8:30	Keynote Speaker	Alex Gesse	Forest Therapy Hub	FT Hub Method and Liquid Interactions Model for Forest Therapy Interventions
	9:00	Practice Session AM Speaker 1	Paola Liliana Rodriguez	Bogotá Botanical Garden	Natural Therapy through the Nature, Health and culture Program of the JBB
	9:20	Practice Session AM Speaker 2	Katriina Kilpi, Vitalija Povilaityte-Petri	International Forest Therapy Days	International Forest Therapy Days as Learning Community
	9:40	Practice Session AM Speaker 3	Romola Porchuk	Global Institute of Forest Therapy (GIFT)	Ecosystem repair through embodied connection, and building credibility in a growing industry
	10:00	Practice Session AM Speaker 4	Tara Brown	The University of British Columbia	Sensing the Forest: Participatory Trail Assessment
	10:20	Practice Session AM Speaker 5	Ronna Schneberger, Susan Abookire	Nature and Forest Therapy of Canada, Harvard Medical School	The Role of Guided Forest Therapy for Healthcare Professionals
10:40	Q & A				
11:00	Closing Workshop & Final Remarks				
12:00	Adjourn				
PM	17:30	Keynote Speaker	Guangyu Wang	The University of British Columbia	Forest therapy: Linking ancient wisdom with science
	18:00	Research Session Speaker 1	Kiyotaka Segami	Forest Therapy Society	Origin, scientific research and future development: forest bathing in Japan and beyond
	18:20	Research Session Speaker 2	Chengcheng Zeng	Zhejiang A&F University	Study on perceived health benefits of landscape features in giant Panda National Park under audio-visual interaction
	18:40	Research Session Speaker 3	Ernest Chi-Hin Ng	The University of Hong Kong	Evolution of research in Forest Therapy: lessons from evidence-based mindfulness practice
	19:00	Research Session Speaker 4	Zhiling Wang	Shanxi Agriculture University	Forest therapy theory & practices in SXAU
	19:20	Research Session Speaker 5	Xiang-Fei Gong	Fujian Agriculture and Forestry University	Environments
	19:40	Research Session Speaker 6	Nicole Craanen	Independent Practitioner	Forest Therapy: The missing link between biophilic design and the built environment
	20:00	Q&A			
	20:20	Closing Workshop & Final Remarks			
	17:30	Keynote Speaker	Uehara Iwao	Tokyo University of Agriculture	Forest Therapy in Japan and its possibility in the world
	18:00	Health Session Speaker 1	Hugh Kim	Korean Forest Therapy Research Institute	Forest Therapy of Korea and Cases of Forest Therapy Integrated with Public Policy
	18:20	Health Session Speaker 2	Lei Yao	Shanghai Jiao Tong University	Construction theory and practice of healing garden based on anxiety relieving function
	18:40	Health Session Speaker 3	Annie Wang	VisionX	Digital Twin Based Forest Therapy
	19:00	Health Session Speaker 4	Anne Rabes	BioCon Valley GmbH	Certification of Healing Forests and the Elaboration of European Standards
	19:20	Health Session Speaker 5	Quan Qiu	University of British Columbia	Forest therapy effects on the blood pressure and salivary cortisol levels of urban residents: A meta-analysis
	19:40	Research Session Speaker 6	Yaoyao Gao	Jiangxi Agricultural University	An empirical study on the effects of forest convalescence on the human physiological and psychological health
	20:00	Q&A			
	20:20	Closing Workshop & Final Remarks			
	17:30	Keynote Speaker	Tamberly Conway	Conservation Conexions	Under the Trees: Forest Therapy Stories in Mycelial Connection
	18:00	Practice Session Speaker 1	Lijun Liu	Forest Therapy Association of China	Current development, challenges and opportunities of Forest Therapy in China
18:20	Practice Session Speaker 2	Kristen Mastel	University of Minnesota	Implementing Forest Therapy into Information Literacy Instruction	
18:40	Practice Session Speaker 3	Philip Hosmer	Nature Worx, Inc.	From Theory to Practice: Delivering Forest Therapy to the Masses	
19:00	Practice Session Speaker 4	Ilaria Doimo	Etifor srl	Can I earn a living from forest-based care? Emerging market development in Europe	
19:20	Practice Session Speaker 5	Jing Luo, Wei Yin Chang	Fujian Agriculture and Forestry University	Therapy	
19:40	Research Session Speaker 6	Xin Wang	Fujian Agriculture and Forestry University	Practice and Improvement: the current undergraduate degree in forest therapy in the Chinese higher education system	
20:00	Q&A				
20:20	Closing Workshop & Final Remarks				
21:20	Adjourn				
July 9th, 2022					
	Time	Description	Name	Institution	Talk Title
	8:30 - 10:30	The virtual guided forest therapy walk be available to all participants through a provided	Tahia Devisscher & Ronna Schneberger		
	17:30 - 19:30				