



**2021**  
Annual **INCOSE**  
international workshop  
Virtual Event  
January 29 - 31, 2021

# Natural Systems

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[www.incose.org/IW2021](http://www.incose.org/IW2021)

## **CHAIR**

Curt McNamara (System Design Review)

## **CO-CHAIRS**

Randy Anway (New Tapestry, LLC)  
Alex Wolf (na2ure.com)

## **INCOSE WEB PAGE**



<https://www.incose.org/incose-member-resources/working-groups/analytic/natural-systems>

## **INCOSE CONNECT ADDRESS**



<https://sites.google.com/site/incosenswg/>

# Charter Summary



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## WG PURPOSE/MISSION

The Natural Systems Engineering Working Group is established to improve System Engineering processes and practices with the application of natural systems knowledge and approaches. The goal is for SEs to take full advantage of natural systems, including both biological systems and the elements and forces of nature.

## WG GOAL(S)

The Working Group will provide the following services:

- (1) Create and maintain a Primer for Natural Systems. Develop SE handbook content. Develop associated white papers, presentations, and tutorials, and provide reference material in a retrievable fashion.
- (2) Establish/cultivate a Natural Systems in System Engineering Community of Practice. This group will work to extend members' knowledge of design inspired by natural systems and investigate the systematic consideration of natural systems in the System Engineering process. The group will use this information to provide a knowledge service to INCOSE and to influence SE standard process models. Regular teleconferenced briefings will be recorded and stored as accessible webinars to enable later reference by members and grow this community of practice.
- (3) Develop and Document Best Practices and Success Stories based on the above assessments and CoP activities and share them with the INCOSE membership. Webinars of at least the CoP presentations will be made accessible on a NSWG website.
- (4) Recommend Enhancements to Standard Process Models (such as the INCOSE SE Handbook) that will benefit by inclusion of information from natural systems.
- (5) Create Growth in numbers and scope of participants, networking with other groups. Collaboration with outside groups will be encouraged.

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## **WG SCOPE**

The Natural Systems Working Group will provide a focal point for gathering current information on the application of Natural Systems to Systems Engineering and the disciplines that support it. As such, they will provide a resource for other INCOSE Working Groups and Committees to draw on for relevant inquiries. The group will follow through on recommendations and make periodic updates to the products above as well as make recommendations for other products, sessions, and reports. The NSWG will maintain files, recordings, and links to reference material so as to provide easy access to its work by INCOSE members.

## **OUTCOMES (PRODUCTS/SERVICES)**

The following products will be developed: material for SE Handbook; Natural Systems Primer; library of short videos on Natural Systems characteristics; regular webinars and recordings; sessions at INCOSE International Workshop; joint sessions with other working groups; tutorials on Natural Systems for System Engineers.

# IW Outcomes



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## IW OUTCOMES

Six sessions: three were joint sessions with other WGs. ~80 attendees for the first four sessions. Two are scheduled for Sunday 1/31.

## PLANNED ACTIVITIES AFTER IW

- Work with CSWG to draft joint work product on emergence best practices
- Complete two short videos on natural systems concepts
- Circulate draft of Natural Systems (NS) Primer for SEs
- Prototype a tutorial on NS for SEs to support primer
- Conduct ~8 monthly webinars for community of practice
- Support NASA Virtual Interchange for Nature Inspired Exploration

## PLANNED WORK PRODUCTS AFTER IW

- Draft joint work product on emergence best practices
- Complete two short videos on natural systems concepts
- Publish draft of Natural Systems (NS) Primer for SEs
- Prototype a tutorial on NS for SEs to support primer
- Complete 5E Handbook content tasks