

# AMPHIBIOUS ARCHITECTURE DESIGN AND ENGINEERING

## ICA ADE 2015

### WHAT IS AMPHIBIOUS ARCHITECTURE?

Amphibious architecture refers to an alternative flood mitigation strategy that allows an otherwise-ordinary structure to float on the surface of rising floodwater rather than succumb to inundation. An amphibious foundation retains a home's connection to the ground by resting firmly on the earth under usual circumstances, yet it allows a house to float as high as necessary when flooding occurs. A buoyancy system beneath the house displaces water to provide flotation as needed, and a vertical guidance system allows the rising and falling house to return to exactly the same place upon descent. Amphibious architecture is a flood mitigation strategy that works in synchrony with a floodprone region's natural cycles of flooding, rather than attempting to obstruct them.

Amphibious construction may also refer to one of several "hybrid" conditions. One such is where the weight of a structure is partially supported by both land and water simultaneously, i.e. where gravity loads are shared by a buoyant substructure and structural elements bearing directly on the solid ground below the water. Another situation is where a mechanical system such as jacks or hydraulic pumps is used to temporarily elevate the structure. A third condition is a "wetproofing" strategy where residents occupy the first floor during dry seasons and move to a second story during periods of flooding.

Amphibious design also includes the concepts of land use planning, site selection, community resilience issues such as the place of amphibious buildings in multiple-lines-of-defense systems, and policy considerations.

Amphibious engineering addresses issues such as infrastructure, mechanical systems and utilities, system components and selection criteria, and codification and certification concerns.

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THE FIRST INTERNATIONAL CONFERENCE ON AMPHIBIOUS ARCHITECTURE, DESIGN AND ENGINEERING

BANGKOK, THAILAND 26 - 29 AUGUST 2015



[www.icaade2015.com](http://www.icaade2015.com)



**ABOUT THE CONFERENCE**

The first International Conference on Amphibious Architecture, Design Engineering will be held in Bangkok, Thailand from August 26 to 29, 2015. This conference will examine a range of themes relevant to enhancing Amphibious Architecture, Design and Engineering as well as encourage discussion of flood resilience in infrastructure systems and communities affected by flood disasters.

**SUBMISSION OF ABSTRACTS**

The ICAADE2015 Organizing Committee invites authors to submit abstracts for presentations on any of the ICAADE2015 topics. Submissions are sought for both oral and poster presentations.

**KEY DATES**

- 1 July 2015 Submission of oral presentation abstracts
- 15 July 2015 Notification of acceptance
- 15 July 2015 Preliminary Conference program
- 15 July 2015 Earlybird registration deadline
- 25 July 2015 Submission of poster abstracts
- 1 August 2015 Submission of final abstracts and papers for publication in conference proceedings

**FURTHER INFORMATION**

Further information can be found on the ICAADE website. Details about the conference registration, schedule, program, venue, tours, sponsorship opportunities and student participation will be posted on the website as it becomes available.

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**1. LIVING WITH WATER**

New, inter-disciplinary approaches are now being developed and implemented to help to 'live with water' rather than fight it. These approaches require a reappraisal of current urban planning and design practices. Urban planners, architects, flood managers and a wide range of other related professionals need to find ways of creatively integrating urban planning and flood risk and water cycle management planning. These sessions aim to achieve a common understanding among countries and across key organizations, practitioners and communities of the basic principles underlying these new approaches.

**2. FLOOD RESILIENT SYSTEMS AND COMMUNITIES**

Any program or project aiming to build flood resilience does best to engage locally and begin with the community as an entry point. These sessions will cover both the technical and social dimensions of flood resilience through exploring pathways to adapting communities and neighborhoods to withstand increasingly frequent flooding. They aim to address strategies and responses for coping with both the repetitive seasonal and the infrequent extreme floods that affect the urban environment at the community level.

**3. VERNACULAR AMPHIBIOUS SOLUTIONS**

There is much that modern society can learn from historical examples of strategies that promote community resilience. For centuries, rural populations living in regions with intermittent flooding have utilized amphibious solutions to protect their lives and property. These sessions will present case studies of historical uses of amphibious construction by indigenous and non-industrialized populations. They will also include more recent examples of grassroots applications of amphibious construction that have "flowed under the radar" of public scrutiny and regulation.

**4. CONCEPTS, TYPOLOGIES AND DESIGNS**

These sessions will make connections among spatial and temporal scales and disciplines. How can amphibious concepts and technologies play a role in the design of flood-resilient urban landscapes? How can public space be conceptualized when a large part is water? What typological transitions are needed to adapt to amphibious living? These sessions will feature innovative concepts, typologies and designs ranging from individual building scale to the scale of neighborhoods or even cities.

**5. CASE STUDIES**

These sessions will feature projects that have been successfully realized. They will highlight the necessary steps for implementation and how the process can be replicated. The intention is to bridge the gap between researchers, professionals, public agencies, private companies and citizens to promote project development, in the process highlighting the technical and social benefits and constraints of amphibious architecture and design.

**6. TECHNOLOGY AND CONSTRUCTION**

In recent years the technical and engineering aspects of amphibious construction are receiving more and more attention, with many researchers and practitioners now working on the topic. Despite this growing interest, the degree of international collaboration remains poor. Given the different approaches used in different parts of the world, there is great potential to accelerate the development and optimization of amphibious technology and construction through the sharing of lessons. These sessions will also pay attention to the technical aspects of site preparation including infrastructure systems such as water storage and drainage, road infrastructure, electricity, drinking water and sanitation at the local level.

**7. CHALLENGES TO IMPLEMENTATION**

These sessions will deal with the impediments at the regional and national level that inhibit the realization of amphibious construction. What stands in the way of implementation? What are the impacts of regulations, codes, zoning, economic factors and cultural resistance to change? What lessons can we learn from the various experiences of negotiating the policies and practices in different countries?

**8. VISIONS FOR THE FUTURE**

Climate change and sea level rise are creating a global crisis. How do we as a world community respond? Amphibious architecture has huge potential to broaden the range of solutions for safe, sustainable, resilient inhabitation across the globe. What are innovative ways in which amphibious construction can protect existing communities? What are new ways of living with water that amphibious design makes possible? What are the ethical, regulatory and environmental implications that should be considered? What visions of the future can we imagine?