



## Adapting to Climate Challenges in Architectural Education in Light of Feng-shui

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### Abstract

Weather challenges have become a significant issue for our society in recent years. Thousands of people have lost their homes and lives. Even though natural hazards are beyond human control, occurring throughout history and continuing their appearance in the future, rapid developments throughout the world have broken the ecological balance and led to Nature's revenge. To build a home on the beach, viewed as a luxury, not only jeopardizes the fragile coastal eco-systems [1], but also puts humans in danger during storms. Houses in coastal areas are built identical to inland homes; houses in high-risk regions for tornadoes are constructed similar to homes in low-risk cities. Buildings designed without taking into account wind factors have been repeatedly destroyed during windstorms. These problems in practice reflect the weak points in education. The knowledge and training to deal with the climate challenges and natural hazards are rarely found in the curriculums of architectural design.

In contrast to the ignorance to climate impacts, our ancestors adapted to climate challenges and built their architecture to respond to nature for survival. Feng-shui, a Chinese practice used to harmonize people with their environment, advises people to avoid cold wind like you would thieves and to collect water like you would treasure. Vernacular houses in many cultures are the precedents of sustainable design [2]. Beijing courtyard houses were designed to protect from windstorm by building exterior walls with small high windows, if windows exist at all [3]. Western coastal fortresses were built on rocky terrains of a strategic defense point and often constructed with sunken courtyards. Protecting from windstorms and creating safe and comfortable living environments for their residents, those types of architecture provide clues for contemporary architects to explore new types of architecture survival in the areas with high risk of tornado, hurricanes or windstorms.

Learning from these case studies, a senior architectural studio in the undergraduate Environmental Design Program at the University of Colorado designed a community cultural center, exploring adaptation to climate challenges, particularly focusing on windstorms in Boulder, Colorado, which has some of the highest peak winds of any city in the U.S [4]. The students integrated scientific knowledge of natural hazards and climate patterns into their project, including the landscape analysis of regional planning as well as the architectural design. This educational experience shows that architects with their special capability in making three-dimensional solutions could create new types of architecture with adaptation to climate challenges. The requirements of sustainability have opened a new direction and opportunities for the future of architectural education and practice.

### References

- [1] McHarg, Ian. 1971. *Design with Nature*. New York: Doubleday & Company, Inc.
- [2] Xu, Ping. 2010 "The Mandala as a Cosmic Model Used to Systematically Structure the Tibetan Buddhist Landscape." *Journal of Architectural and Planning Research*, Volume 27:3, pp. 181-203.
- [3] Xu, Ping. 1998. "Feng-shui Models Structure Traditional Beijing Courtyard Houses." *Journal of Architectural and Planning Research*, Volume 15:4, pp. 271-282.
- [4] U.S. Department of Commerce National Oceanic and Atmospheric Association (2012). *Boulder Wind Info*.<http://www.ersl.noaa.gov/psd/boulder/wind.html>