Session: C1 Poster: M228A

The Development of expert system based on the Index of ENSO, DMI, Monsoon, and MJO for determination of early wet and dry season over Indonesia

Eddy Hermawan[†]; Juniarti Visa; Trismidianto -; Krismianto -; Ibnu Fathrio
[†] National Institute of Aeronautics and Space (LAPAN), Indonesia
Leading author: eddy_lapan@yahoo.com

Climate is one of the nine GEOSS (Global Earth Observation System to System) Social Benefit Areas. Its variability has been discussed at the past three Asia-Pacific symposia, mainly as concerns global warming on a centuries scale. However, climate variability ranges over a broader band of time scales that interact with each other. In particular, shorter variability on interannual, annual, intraseasonal and diurnal time scales is a dominant feature of the Indonesian Maritime Continent (IMC), and its surrounding oceans that located in the between two great Oceans (Pacific and India), and two great Continents (Asia and Australia). Therefore, in reviewed our understanding of such climate variability and addressed ways to work more closely together to enhance monitoring networks and predictive capacity for the citizens of the Asia-Pacific region. Prediction of climate variability provides a pathway to socio-economic applications and relies strongly on observed data, which are necessary for generating appropriate initial conditions in prediction models. Apart from the El Niño - Southern Oscillation (ENSO) in the tropical Pacific, no other coupled ocean-atmosphere phenomena has greater socio-economic impacts in the Asia-Pacific region than the Indian Ocean Dipole (IOD), which is similar to ENSO, but has a higher frequency in the Indian Ocean. As a unique/specific country at the equatorial region called as IMC, where Monsoon is one of the most pre-dominant peak oscillation, this research is mainly concerned to develop the expert system on determining the early of wet and dry season over Indonesia based on the analysis of many global index data, such as ENSO (El-Niño-Southern Oscillation), DMI (Dipole Mode Index), Monsoon itself, and MJO (Madden-Julian Oscillation). As already recommended by the Fourth GEOSS Asia-Pacific Symposium in March, 2010 at Bali, the large scale atmospheric teleconnections/interactions linking climate phenomena, their regional expressions, and relevance for future regional climate change should be investigated more comprehensively. By this reason, the main weight of this research activity is focused on the development of expert systems based on the analysis of interactions of the global climate system component data, such as ENSO, DMI, Monsoon, and MJO to pre-determined wet and dry season, with the main target of obtaining a model for predicting rainfall distribution pattern in the center area of food crop production spread in several regions of Indonesia on the basis of the consideration that many global climate data such as the ENSO index, DMI index, Monsoon index, MJO index, etc., which until now its existence has not been used optimally. The data set is long enough (typically more than 30 years), and is available for free on the internet. The results of our analysis is indicating that the interconnection/interactions which took place between the various parameters of the global climate index is very significant effect on the behavior of rainfall that occurred in Indonesia. We estimate the dry phenomenon that allegedly will occur 2012/2013, and is also the case of only one course of the rainy season in 2010, included in the main discussion of this research activity. At the end of the report, we also show the development of expert system software based on Visual Basic 6.0 programming results of the estimation of rainfall that would be occurred at Sukamandi as one of the center rice production at West Java based on data analysis of SST Nino 3.4 and IOD in the form of display on the web.