# Introduction to New Animation Maps Products on the TCC Website

**In November 2012, TCC started providing new monitoring products called Animation Maps on its website. These resources are useful in monitoring intraseasonal variations of convective activity and atmospheric circulation. This article briefly introduces the products and highlights some examples of analysis.**

Animation Maps are available at http://ds.data.jma.go.jp/tcc/tcc/products/clisys/acmi.html.

## 1. General explanation

The Animation Maps web pages cover four areas: the Asian Region, the Northern Hemisphere, the Southern Hemisphere and the Global Area. Data on major elements for use in monitoring extratropical circulation (such as sea level pressure, 500-hPa geopotential height and 850-hPa temperature) shown on polar stereographic charts are available on the Northern Hemisphere and Southern Hemisphere pages, and data for use in monitoring tropical convective activity and circulation (such as outgoing longwave radiation (OLR), velocity potential and stream function) are available on the Asian Region and Global Area pages. Animation Maps are available for the period from 1958 to two days prior, and are updated every day.

Figure 1 shows a screenshot of the Northern Hemisphere page with selectable elements and dates in the pull-down menus (B) and (E), respectively. Two elements can be shown simultaneously except on the Global Area page. Daily, 5-day, 7-day, 10-day and 30-day average charts are available for all elements (default: 5-day mean) and can be selected from the pull-down menu (A). Clicking the +1-day and -1-day buttons in (C) moves the charts forward and backward, respectively, by one day. The buttons in D control the animation.

The following sections highlight two examples of analysis using Animation Maps. These involve the propagation of tropical intraseasonal oscillations and the seasonal march of the Asian summer monsoon.

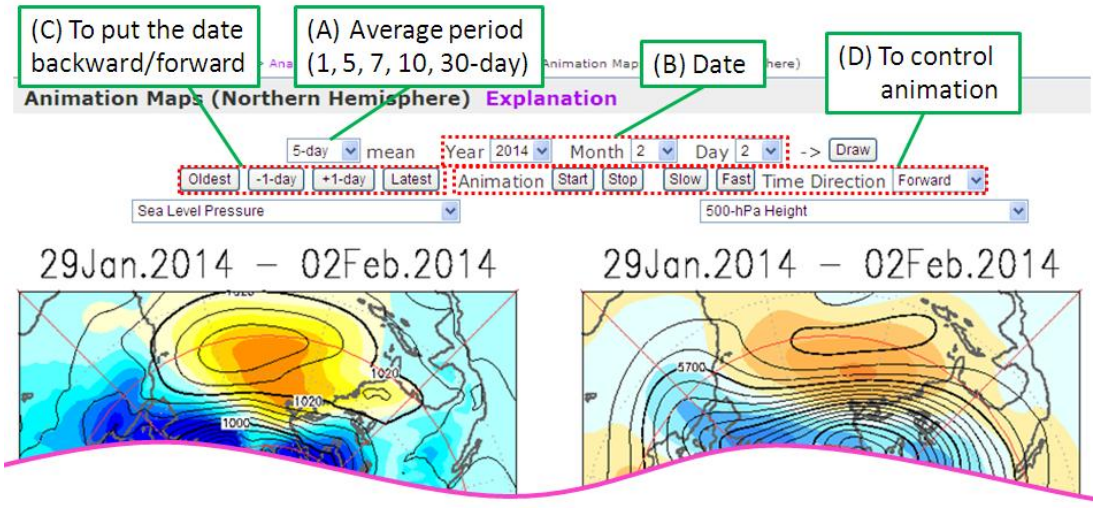


**Figure 1 Animation Maps page layout (Northern Hemisphere)**

## 2. Example 1: Propagation of tropical intraseasonal oscillations

The Global Area page supports monitoring of intraseasonal oscillations such as the Madden-Julian Oscillation (MJO), which propagates eastward along the equator. When the pull-down menus here are set as shown in Figure 2, the page displays a seven-day mean chart of OLR (shading), 200-hPa velocity potential (contours) and 200-hPa divergence wind (vectors) anomalies for the period from 24 February to 1 March, 2012. The chart displayed shows blue shading (active convection) and green contours (stronger-than-normal divergence in the upper troposphere) over the Indian Ocean, indicating that the active phase of the MJO is located there.


**Figure 2 Global Area page pull-down menu settings for Example 1**

By clicking the +1-day button repeatedly or the Start button once, the user can follow the eastward movement of the MJO along the equator (Figure 3). It can be seen that the MJO moved eastward and reached the maritime continent in mid-March and the western Pacific late in the month. After that, it was not clearly seen over South America or the Atlantic, but appeared again in amplified form over the Indian Ocean in mid-April.

It is well known that northward-moving intraseasonal oscillations appearing over the northern Indian Ocean during boreal summer affect Asian Monsoon activity. Animation Maps are useful for monitoring such intraseasonal variations.

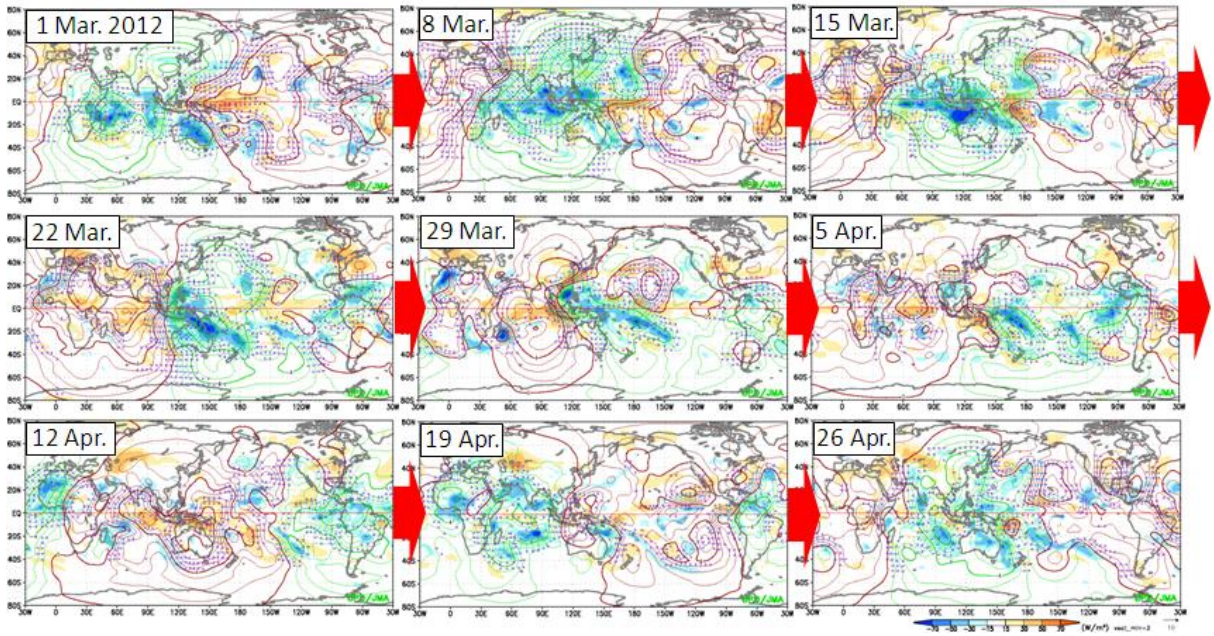


**Figure 3 Example of Madden-Julian Oscillation (MJO) monitoring**

Each panel shows the seven-day average for the period ending on the date shown in its upper-left corner. The shading indicates outgoing longwave radiation anomalies (OLR; $W/m^2$), and the contours show 200-hPa velocity potential anomalies at intervals of $1 \times 10^6$ $m^2/s$. The vectors denote 200-hPa divergent wind anomalies.

## 3. Example 2: Seasonal march of the Asian summer monsoon

This section outlines the display of the Asian summer monsoon's normal seasonal march using Animation Maps from the Asian Region page. Five-day mean charts of normal conditions for upper and lower tropospheric circulation with convective activity can be displayed on this page by setting the pull-down menus as shown in Figure 4. The shading and contours indicate OLR and the stream function, respectively. The panels on the left and right show the upper and lower troposphere.


**Figure 4 Asian Region page pull-down menu settings for Example 2**

By clicking the +1-day button repeatedly or the Start button once, the user can follow the seasonal march of the Asian summer monsoon, which exhibits a meridional transition of active convection areas, monsoon westerly winds in the lower troposphere, and the development of the Tibetan High in the upper troposphere (Figure 5).

Running animations of actual and normal conditions side by side on the Asian Region page allows analysis of advances or delays in the seasonal march with respect to the normal.

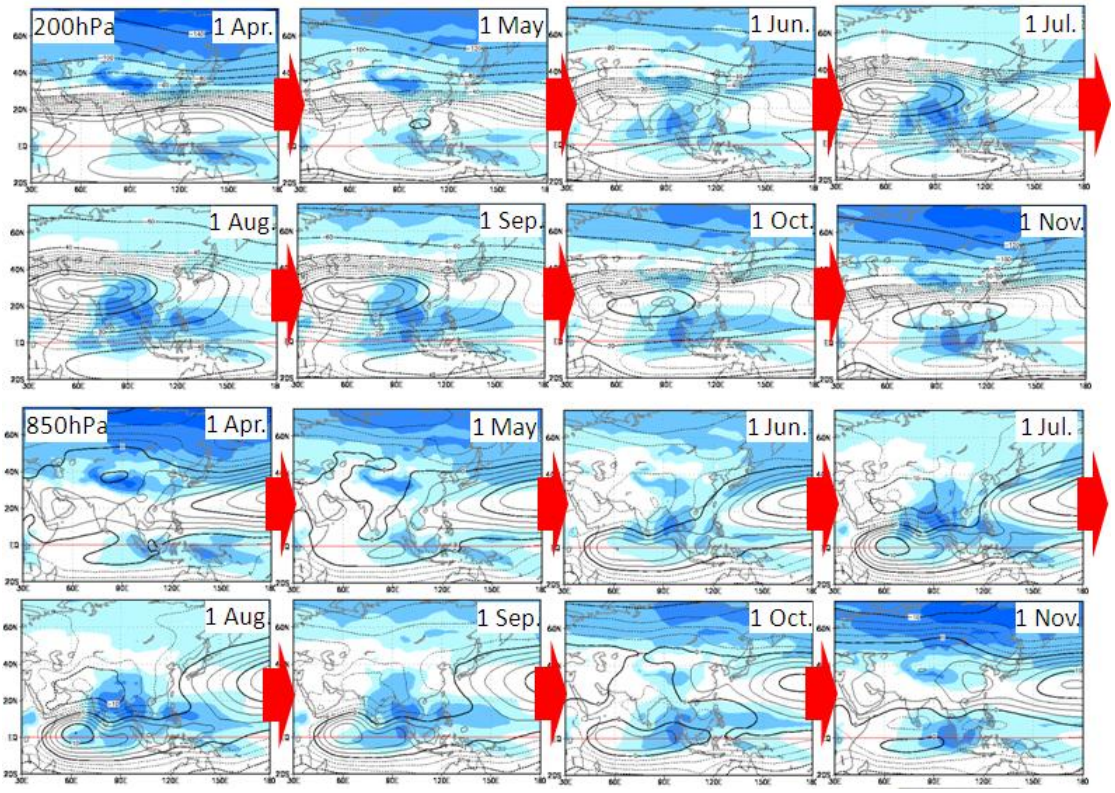


**Figure 5 Seasonal march of the normal Asian summer monsoon**

Each panel shows the five-day average for the period ending on the date shown in its upper-right corner. The shading indicates normal outgoing longwave radiation (OLR; $W/m^2$), and the contours show normal (upper) 200-hPa and (lower) 850-hPa stream functions at intervals of 5 and 2.5 x $10^6$ $m^2/s$, respectively.

These examples are only two instances of how Animation Maps can be used. Those on the Northern Hemisphere and Southern Hemisphere pages are useful for monitoring intraseasonal variations of atmospheric circulation such as the development and decay of blocking highs and teleconnection patterns.