



Global MCS Data Quality Check

Zhe Feng
Jan 25, 2021

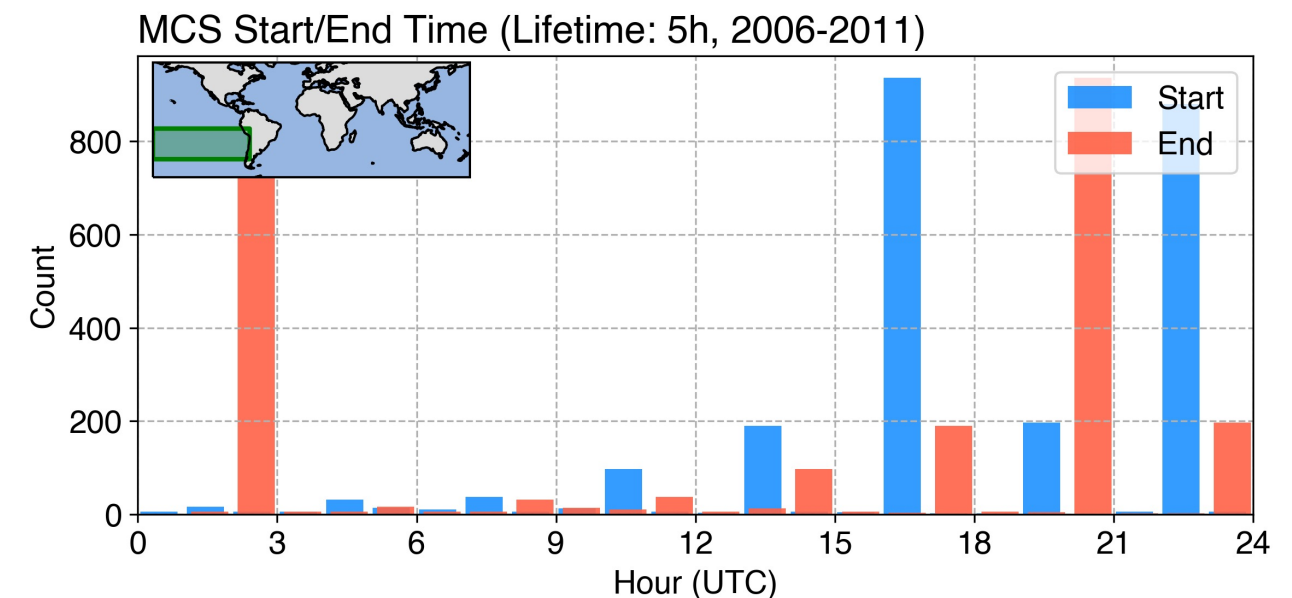
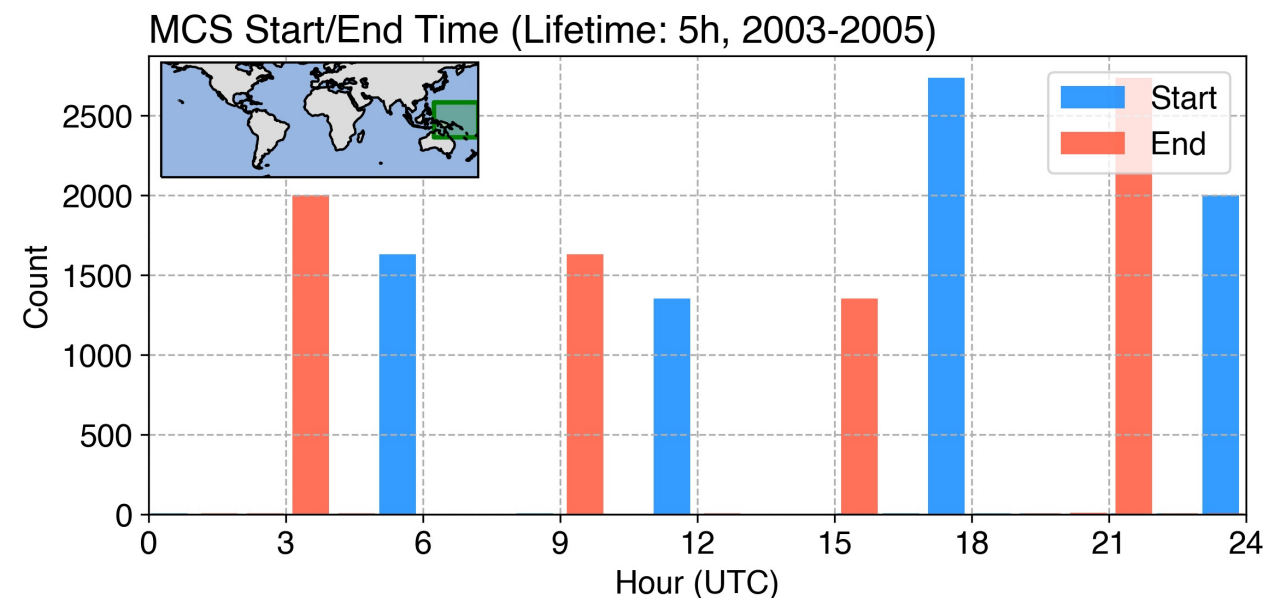


PNNL is operated by Battelle for the U.S. Department of Energy



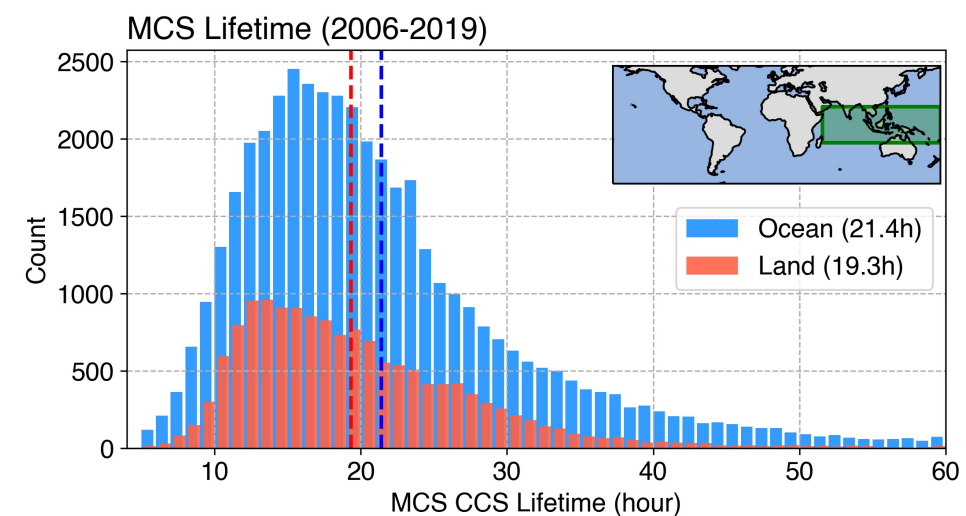
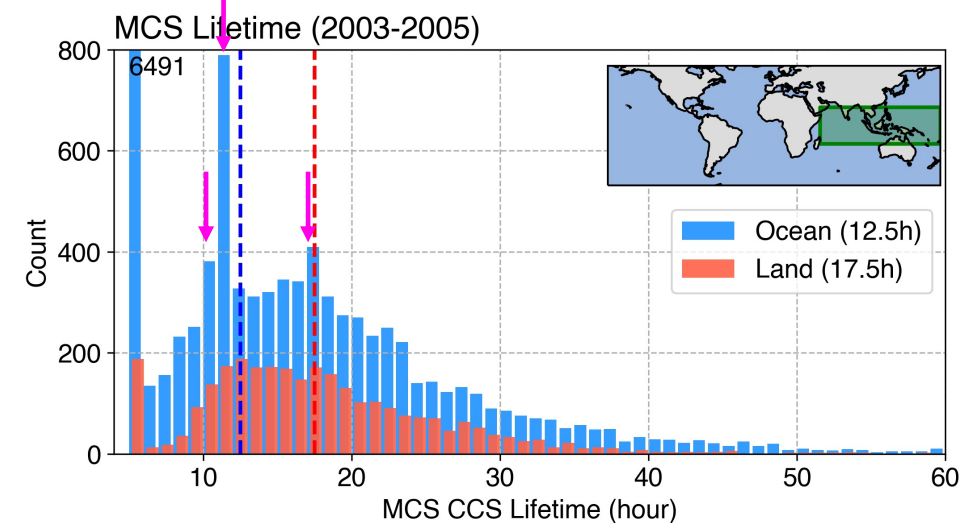
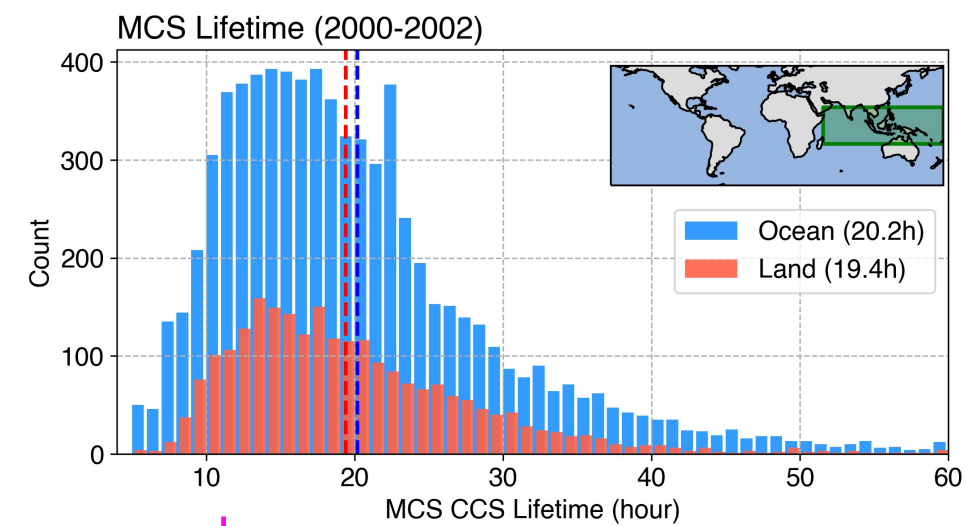
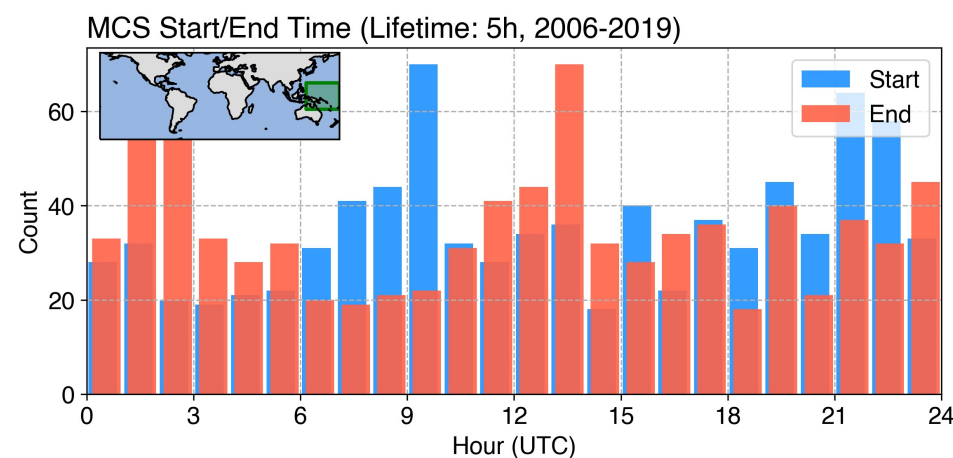
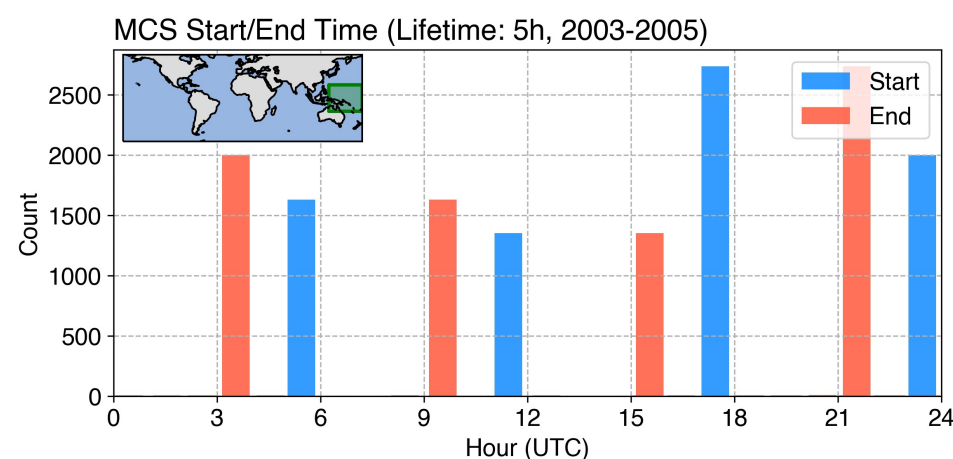
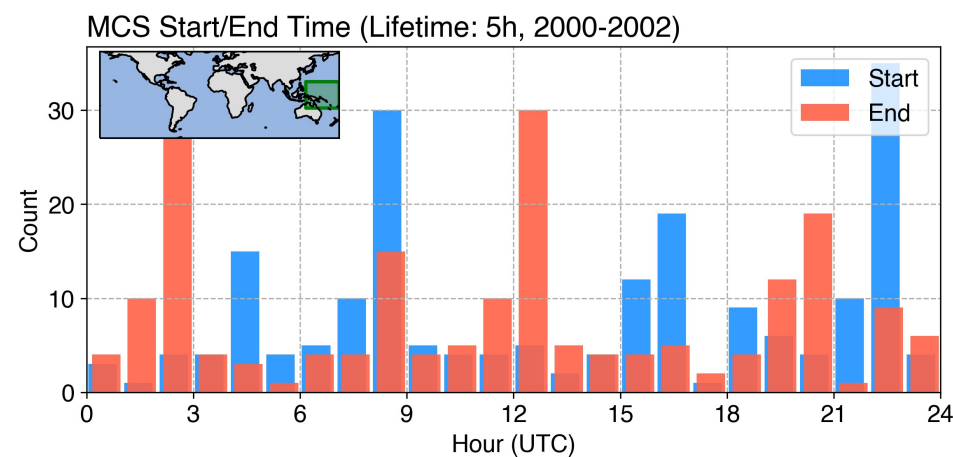
Summary

- During **2003-2005**, East Asia (130°E-180°E) has frequent missing IR T_b data at 4 specific hours of the day, artificially increasing MCS number with 5-hour lifetime significantly, while reducing the number of longer-lived MCSs
 - The impact on MCSs in east Maritime Continent is significant
- During **2006-2011**, S.E. Pacific has more frequent missing IR T_b data at 2 specific hour of the day, artificially increasing MCS number with 5-hour lifetime
 - The impact on MCS statistics is relatively smaller as further east of 180°W, MCSs are less frequent



Missing IR Data Hours

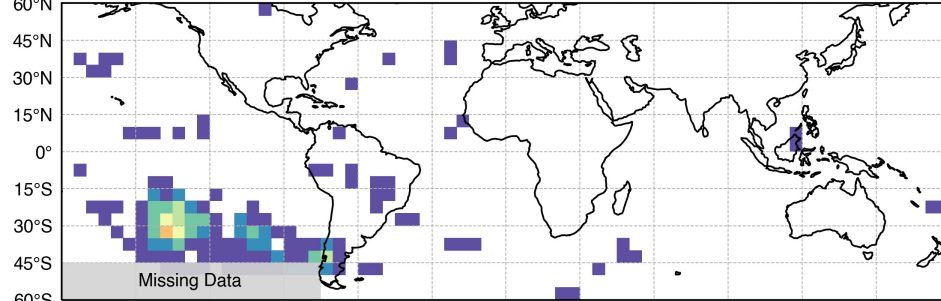
- During 2003-2005, E Asia missing IR data frequently occurs at regular 5 hourly intervals
 - 5-h long MCSs are excessively increased
 - 10, 11, 17 h MCSs are also noticeably more
- While other years also have missing data, the impact is much smaller



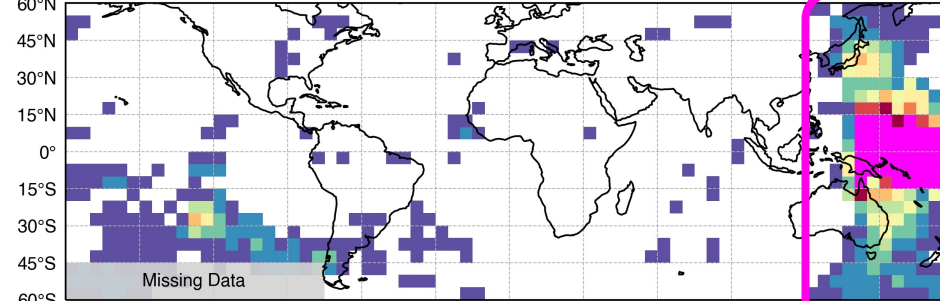
5-h MCS Number (2000-2011)



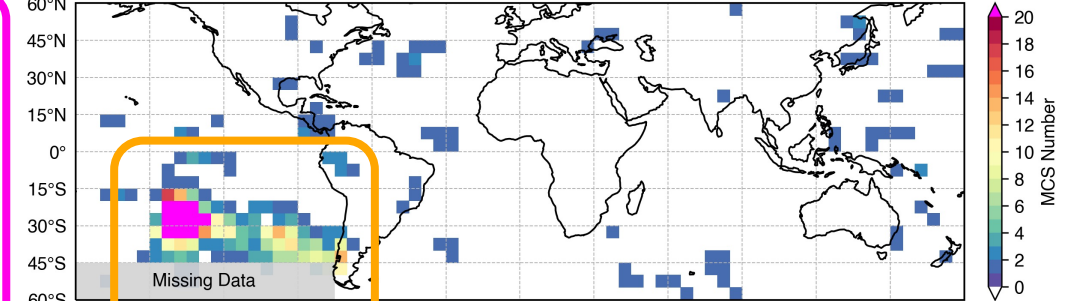
2000 Annual Number of MCS (Lifetime = 5 h)



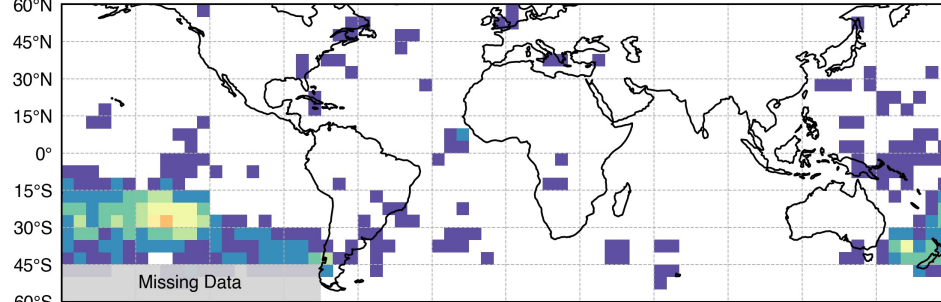
2004 Annual Number of MCS (Lifetime = 5 h)



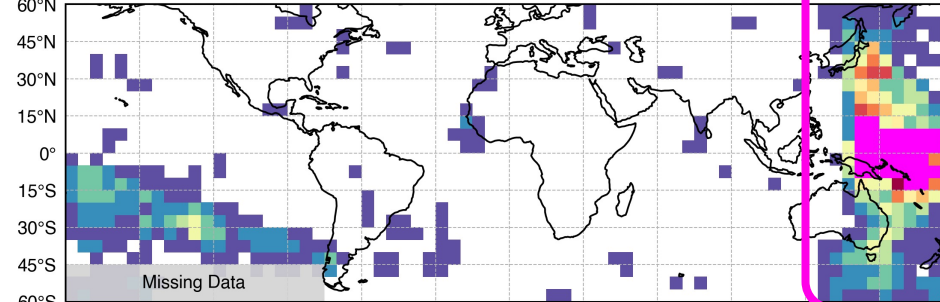
2008 Annual Number of MCS (Lifetime = 5 h)



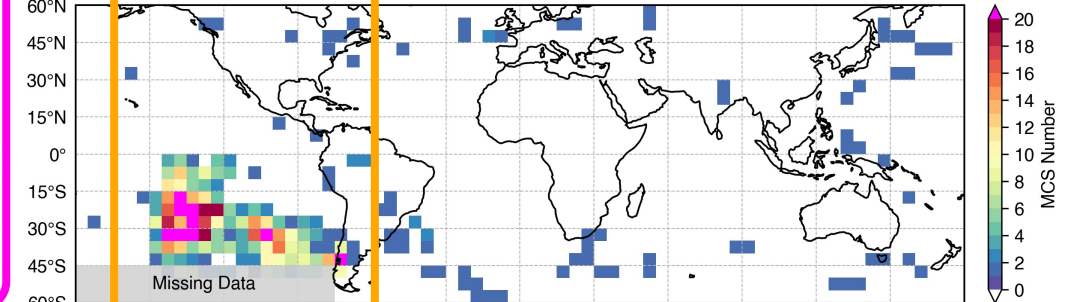
2001 Annual Number of MCS (Lifetime = 5 h)



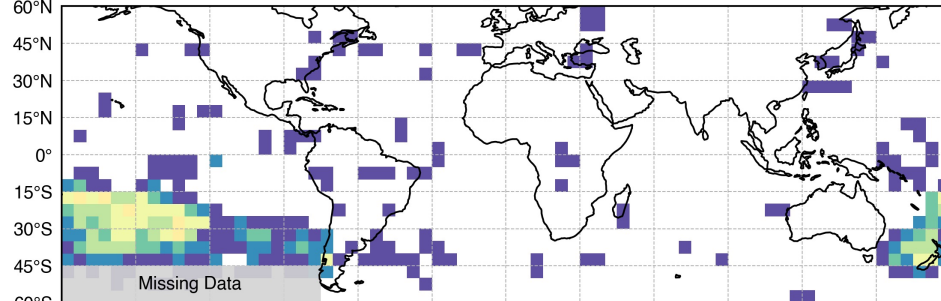
2005 Annual Number of MCS (Lifetime = 5 h)



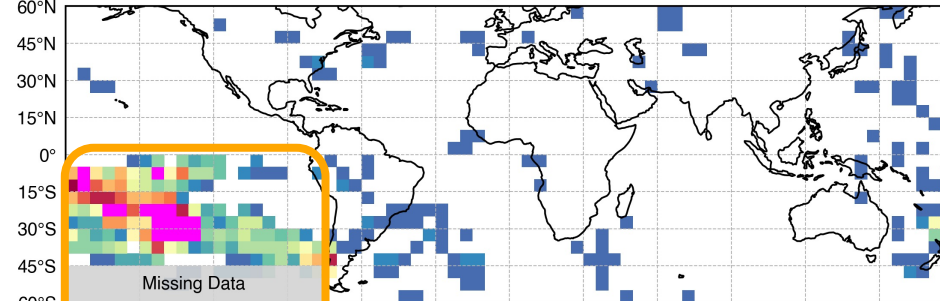
2009 Annual Number of MCS (Lifetime = 5 h)



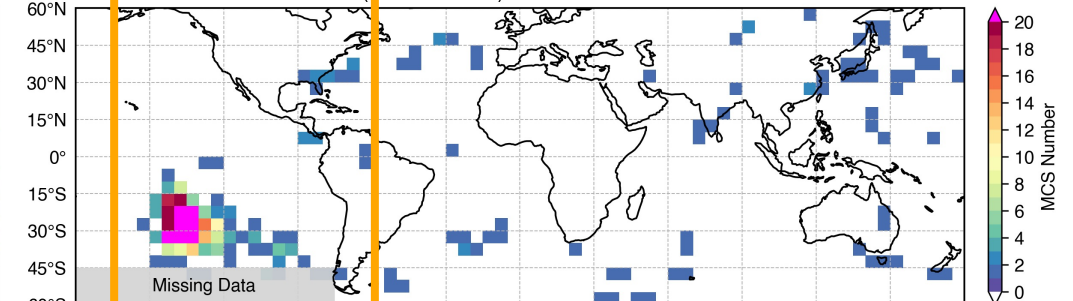
2002 Annual Number of MCS (Lifetime = 5 h)



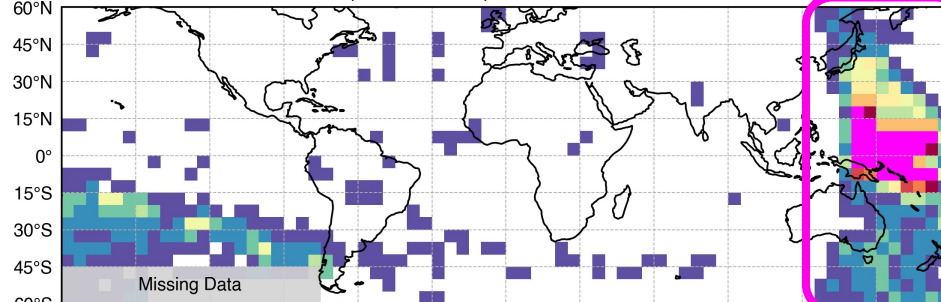
2006 Annual Number of MCS (Lifetime = 5 h)



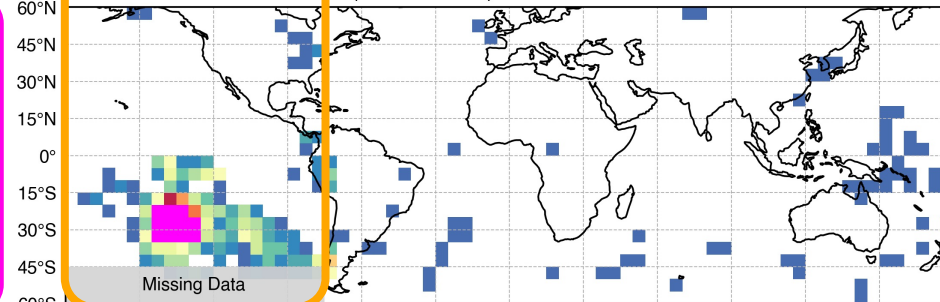
2010 Annual Number of MCS (Lifetime = 5 h)



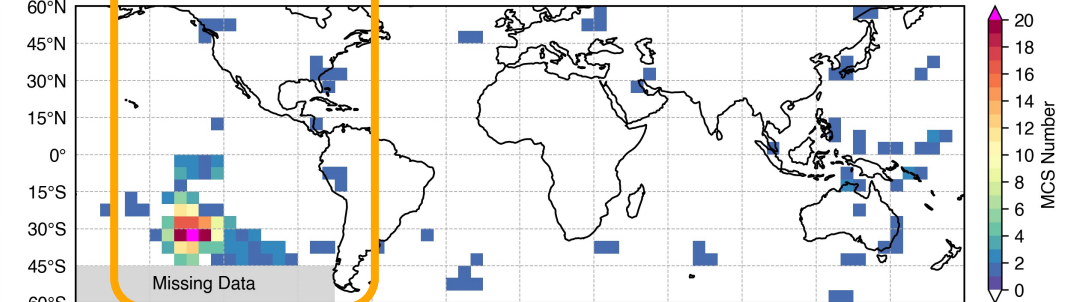
2003 Annual Number of MCS (Lifetime = 5 h)



2007 Annual Number of MCS (Lifetime = 5 h)



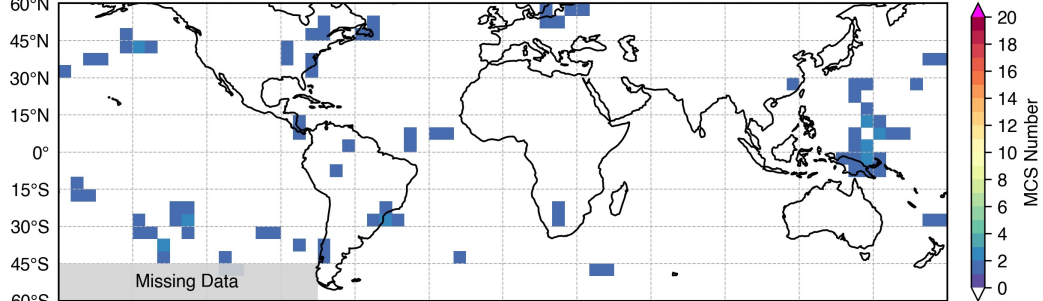
2011 Annual Number of MCS (Lifetime = 5 h)



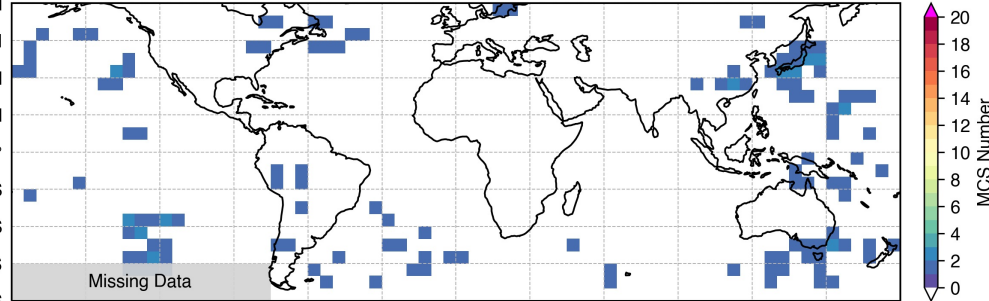
5-h MCS Number (2012-2019)



2012 Annual Number of MCS (Lifetime = 5 h)

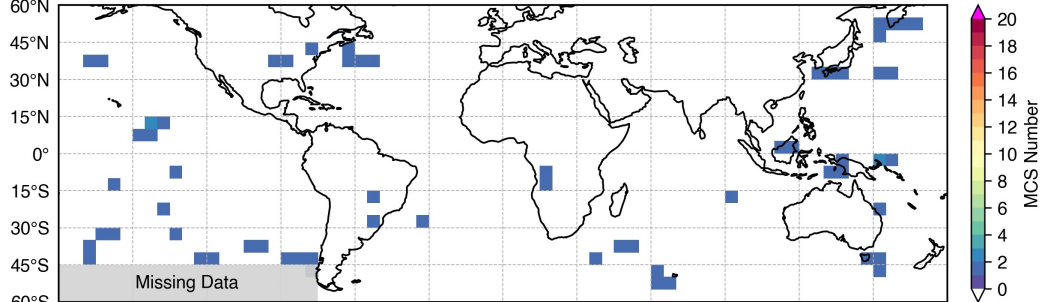


2016 Annual Number of MCS (Lifetime = 5 h)

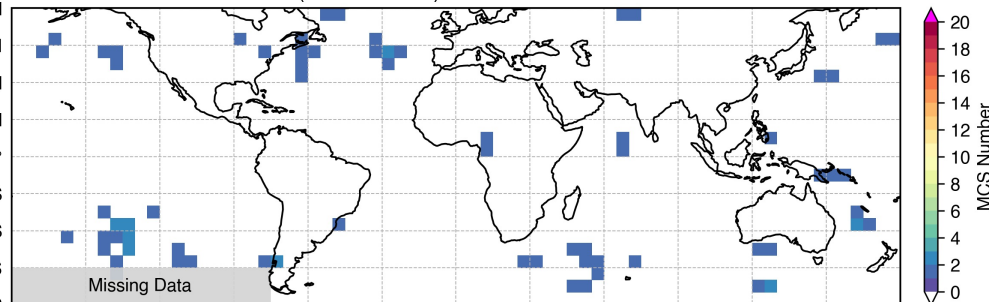


- Number of 5-h MCS are small during these years

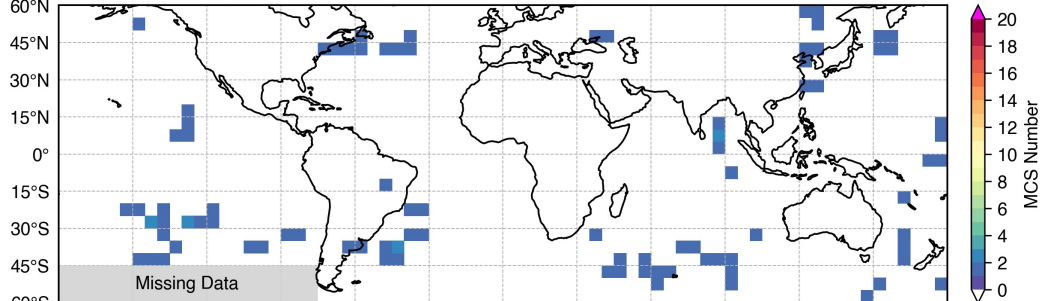
2013 Annual Number of MCS (Lifetime = 5 h)



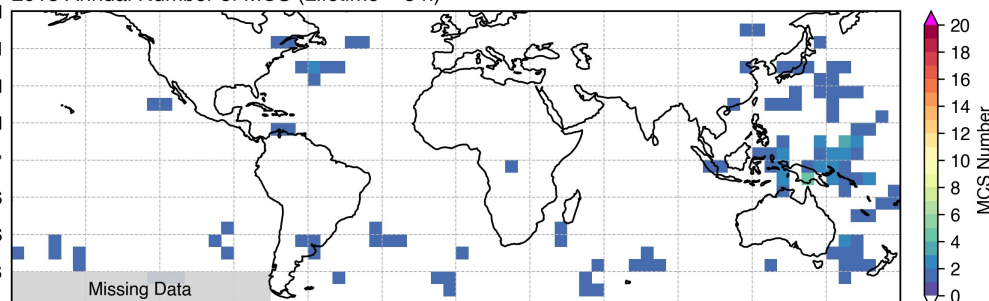
2017 Annual Number of MCS (Lifetime = 5 h)



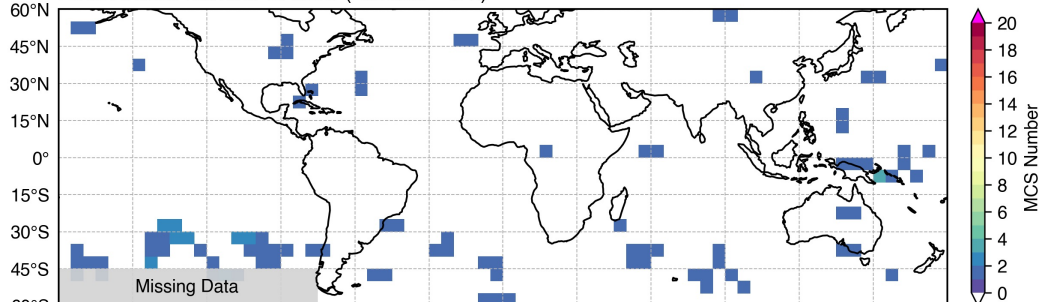
2014 Annual Number of MCS (Lifetime = 5 h)



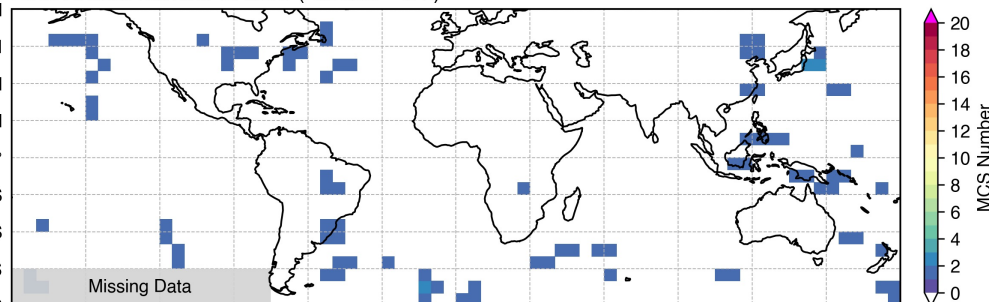
2018 Annual Number of MCS (Lifetime = 5 h)



2015 Annual Number of MCS (Lifetime = 5 h)



2019 Annual Number of MCS (Lifetime = 5 h)



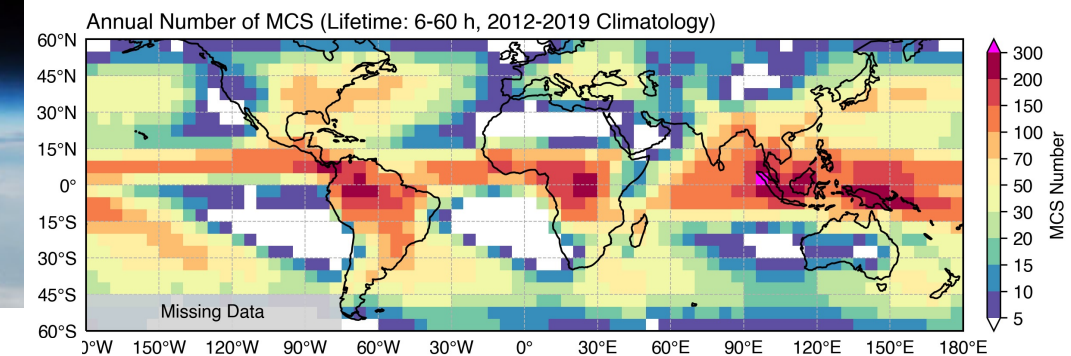
5-h vs. 6-60 h MCS Number Annual Map





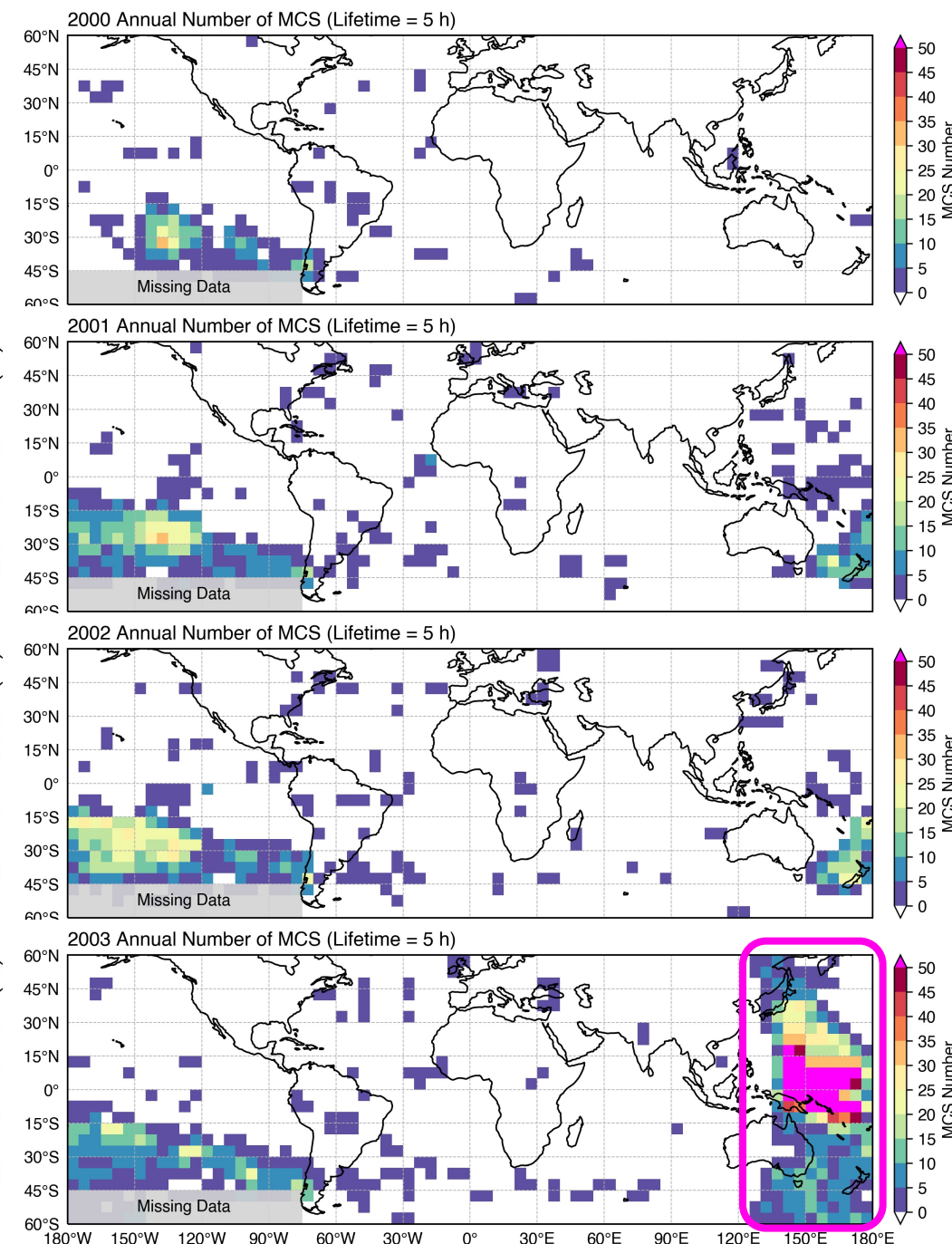
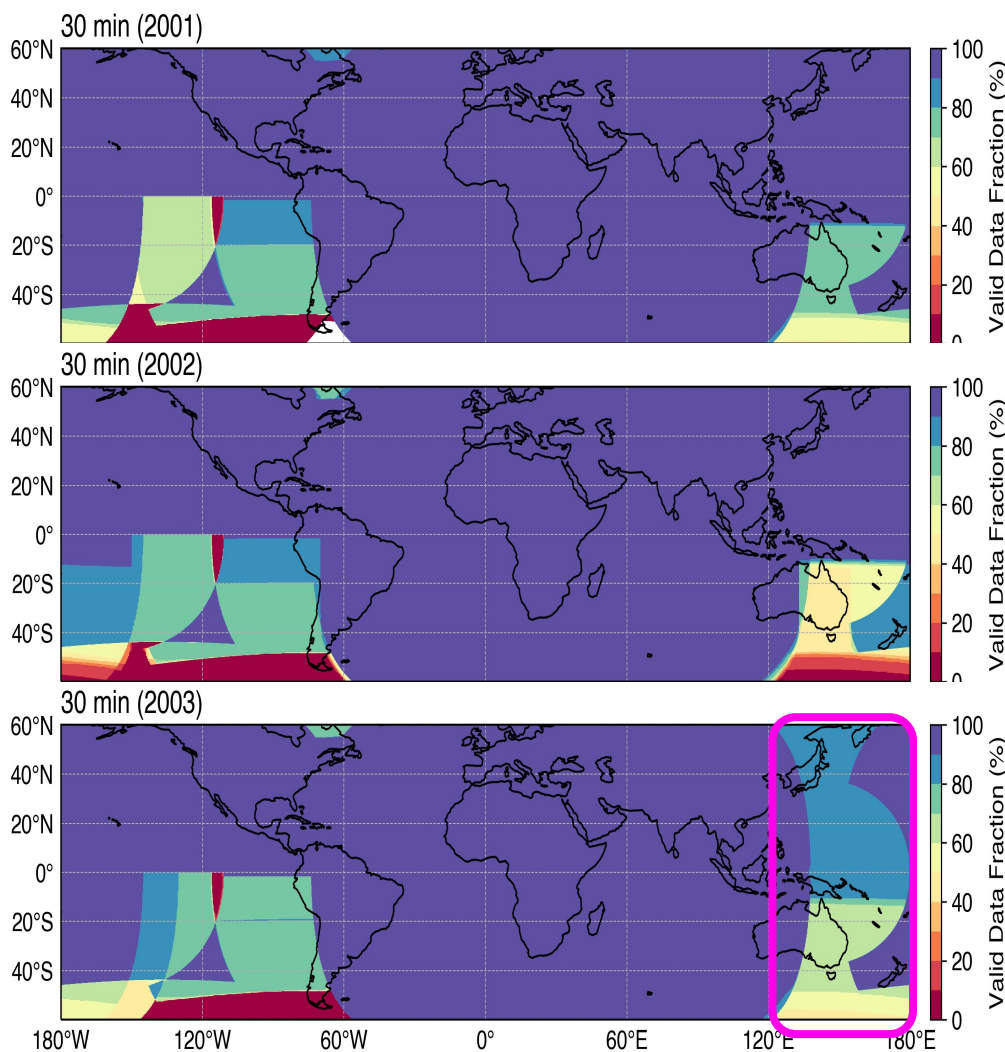
5-h MCS Number (2000-2003)

5-h MCS Number

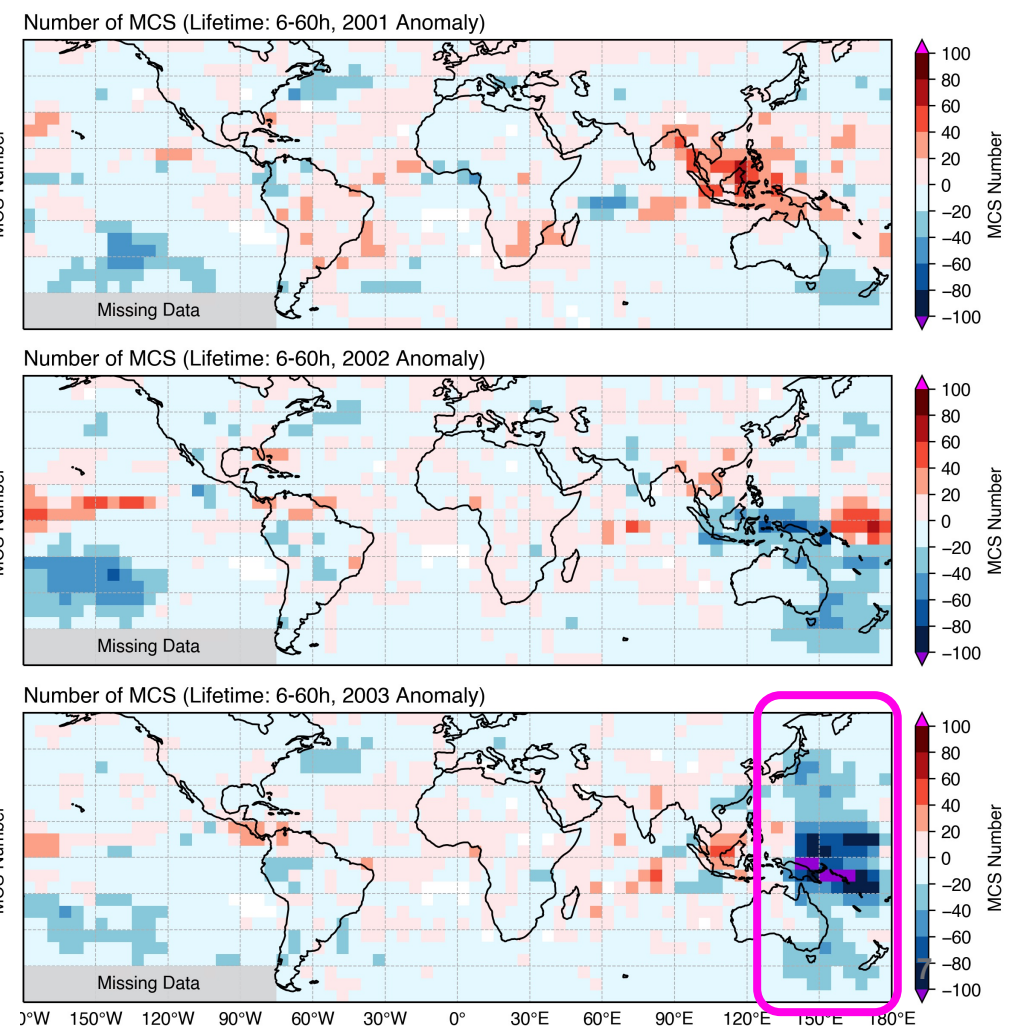


Valid IR Data Frequency

30 min IR T_b is used for tracking



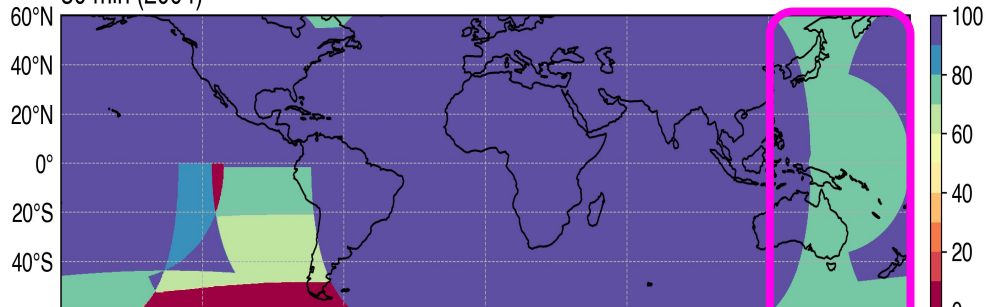
6-60 h MCS Number Anomaly



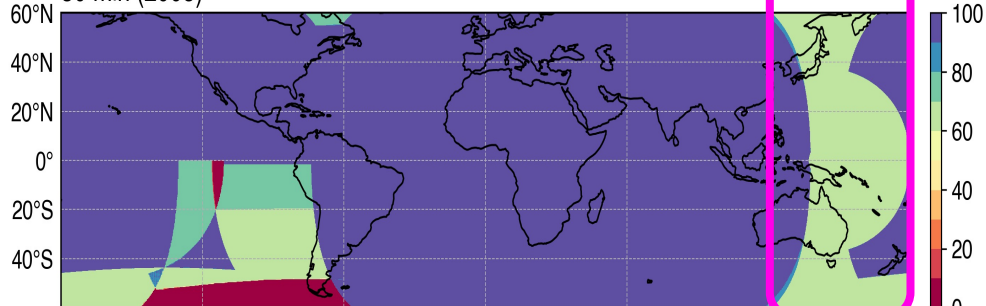
MCS Number (2004-2007)

5-h MCS Number

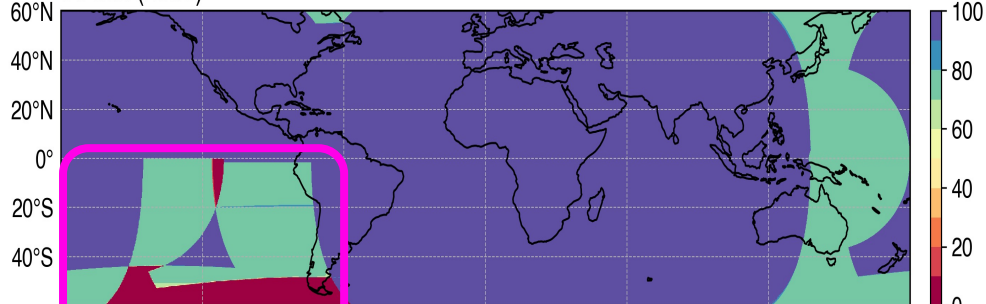
30 min (2004)



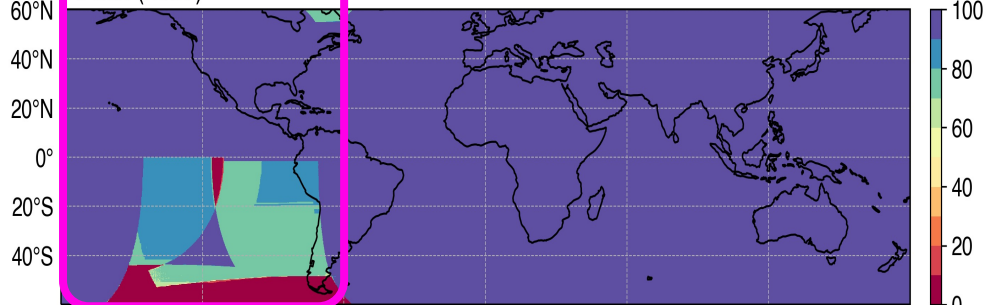
30 min (2005)



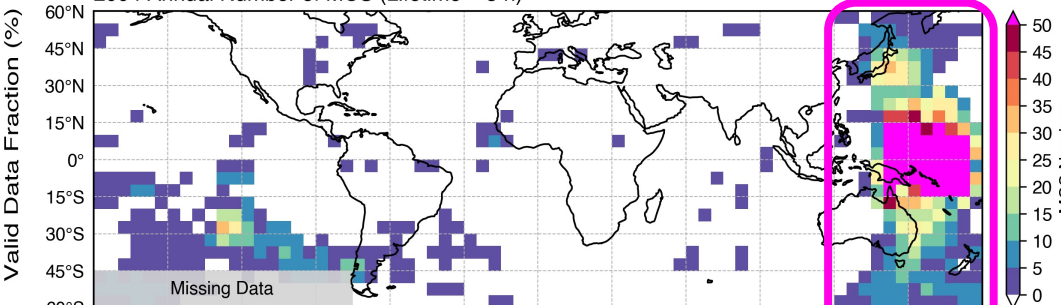
30 min (2006)



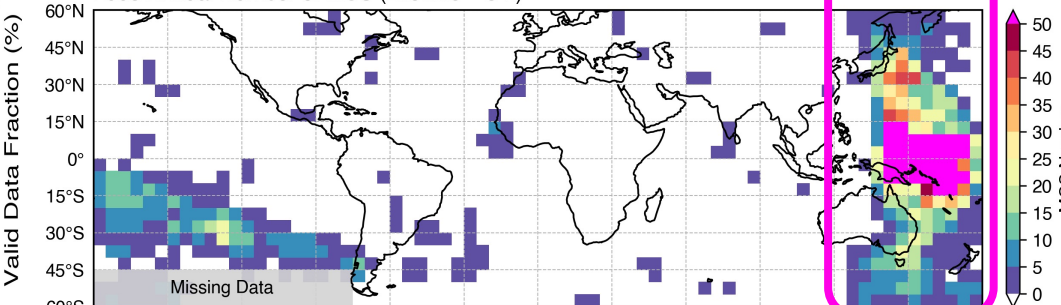
30 min (2007)



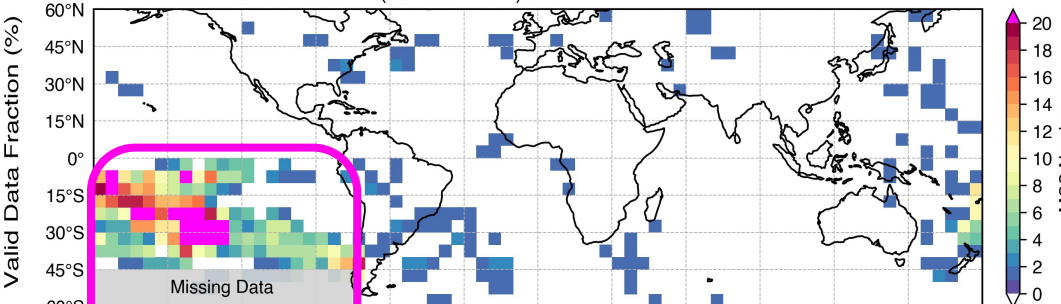
2004 Annual Number of MCS (Lifetime = 5 h)



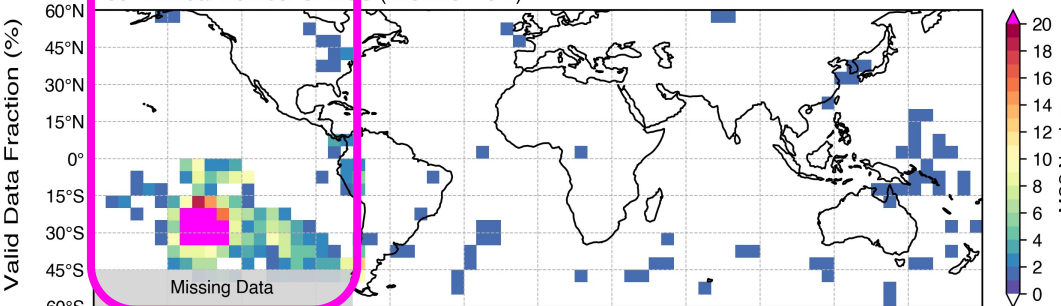
2005 Annual Number of MCS (Lifetime = 5 h)



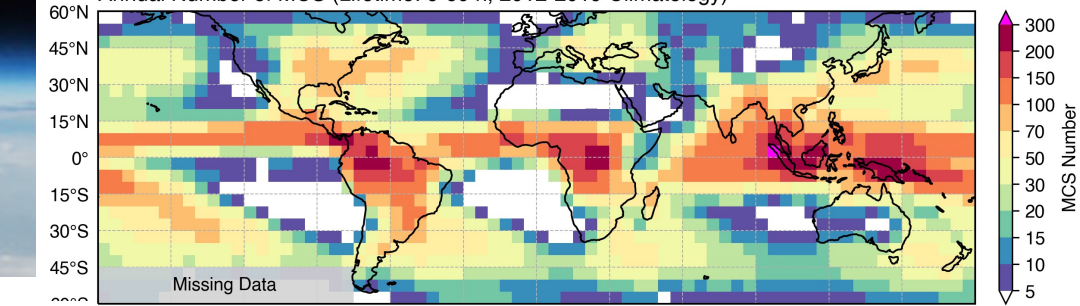
2006 Annual Number of MCS (Lifetime = 5 h)



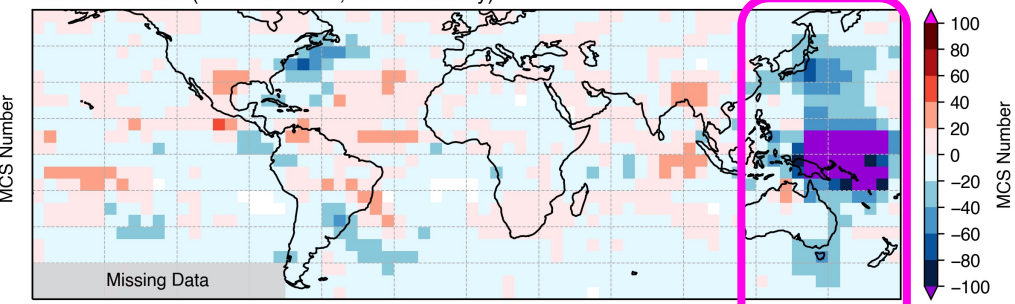
2007 Annual Number of MCS (Lifetime = 5 h)



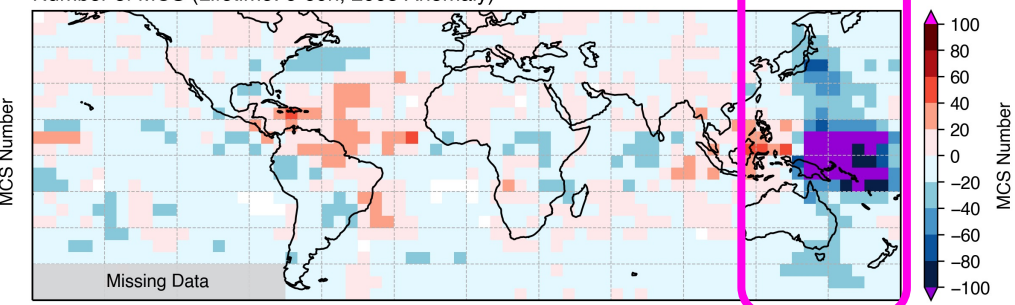
Annual Number of MCS (Lifetime: 6-60 h, 1979-2019 Climatology)



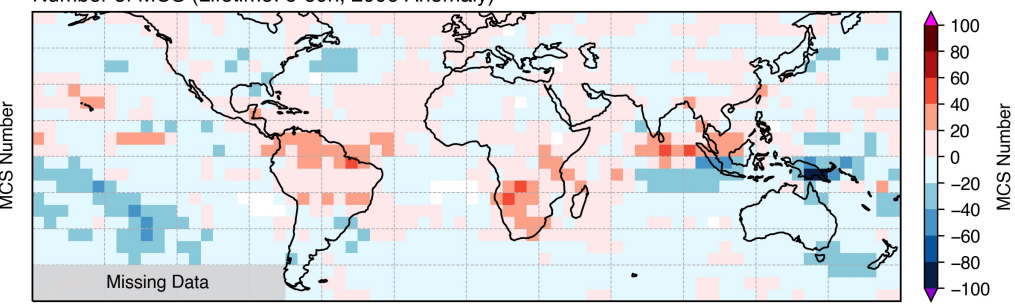
Number of MCS (Lifetime: 6-60h, 2004 Anomaly)



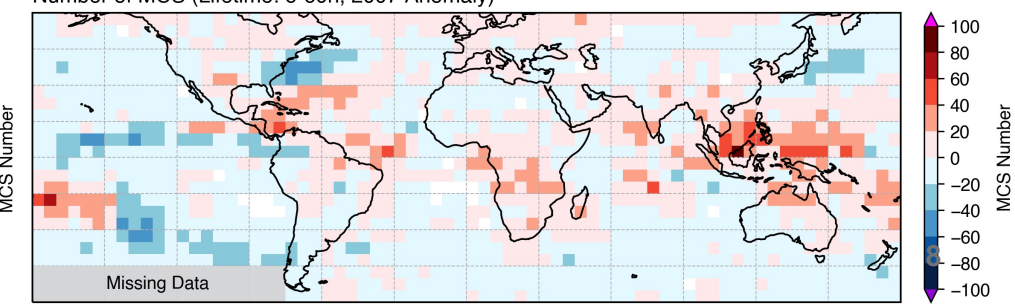
Number of MCS (Lifetime: 6-60h, 2005 Anomaly)



Number of MCS (Lifetime: 6-60h, 2006 Anomaly)

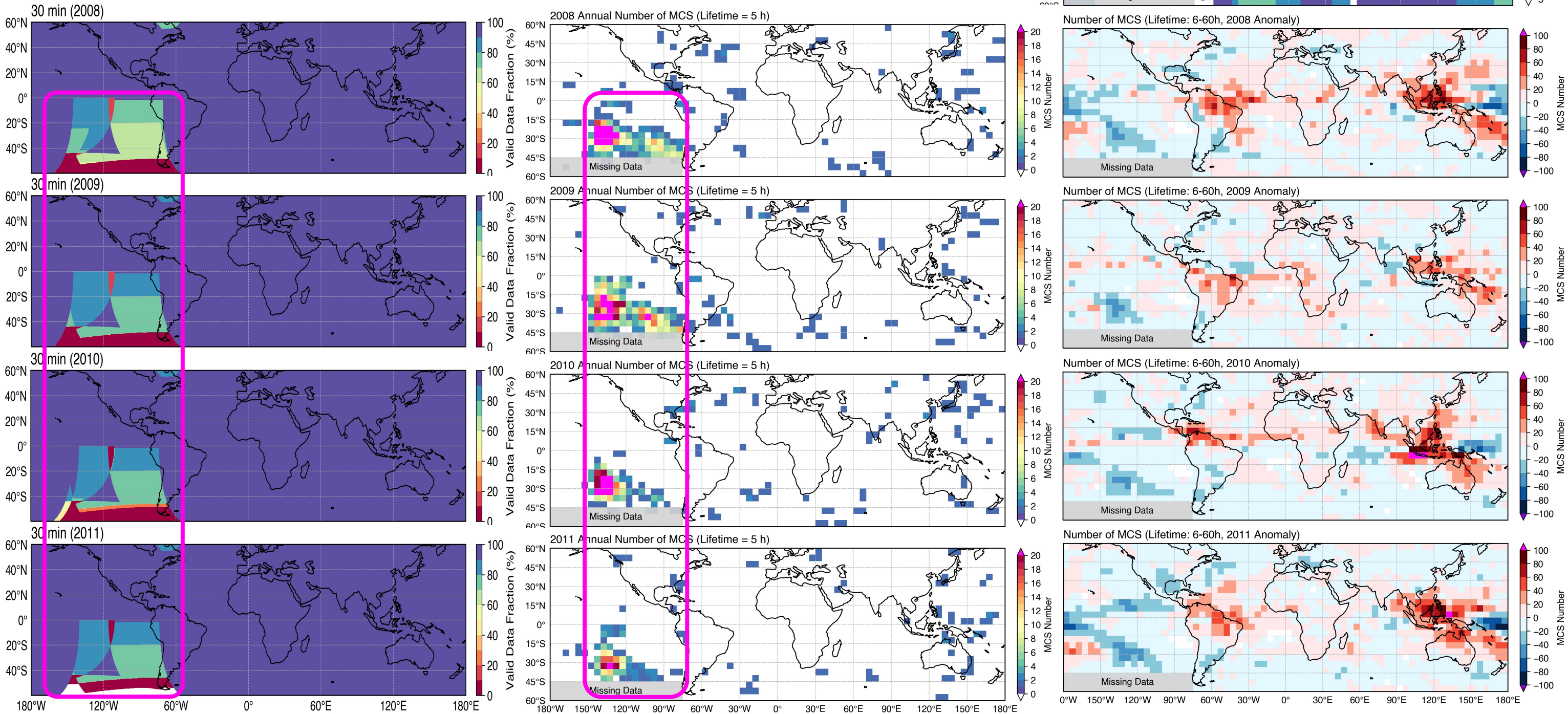


Number of MCS (Lifetime: 6-60h, 2007 Anomaly)



MCS Number (2008-2011)

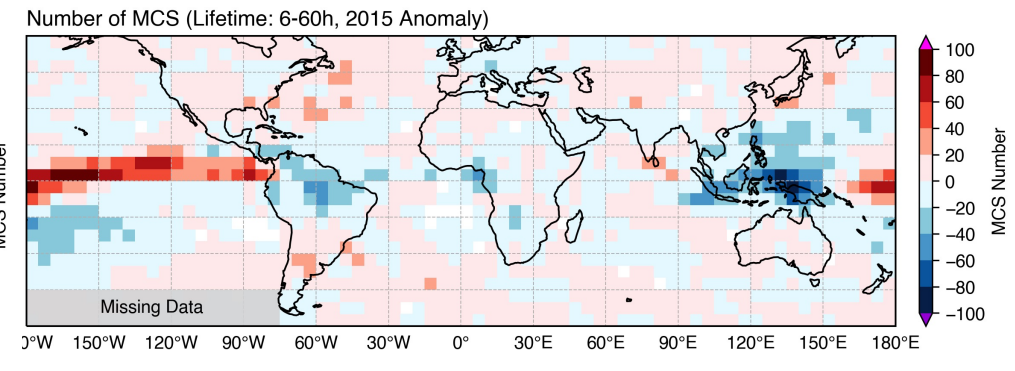
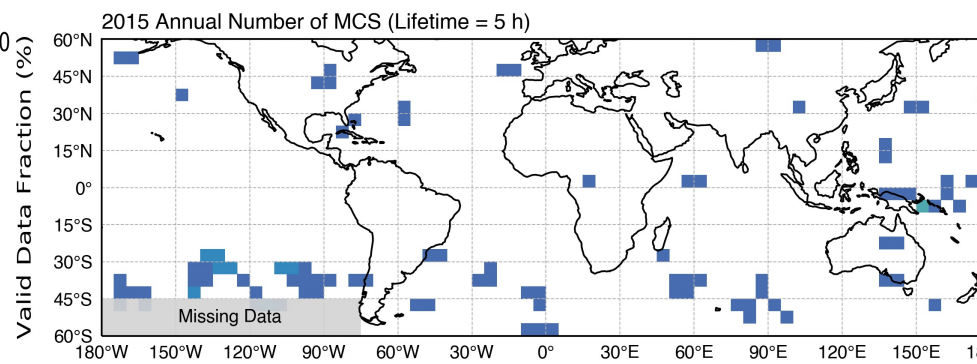
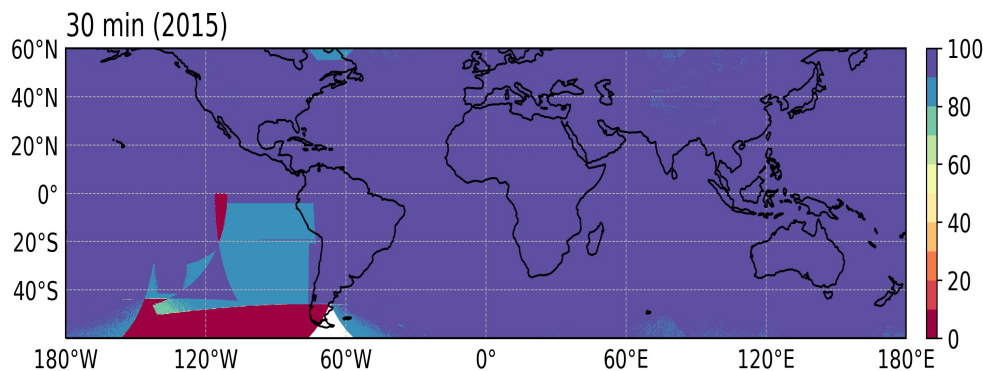
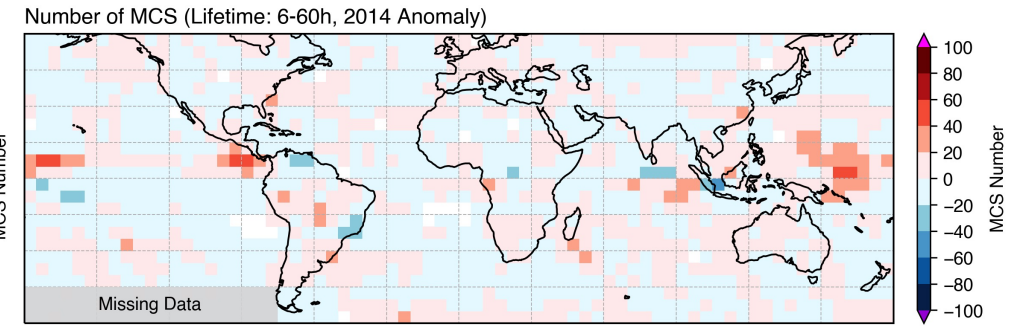
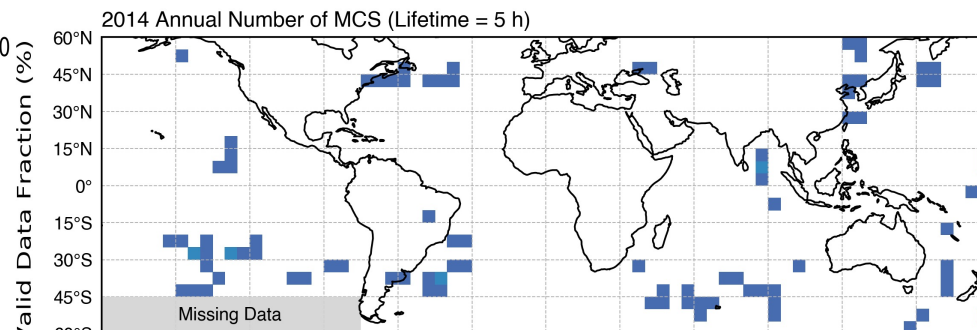
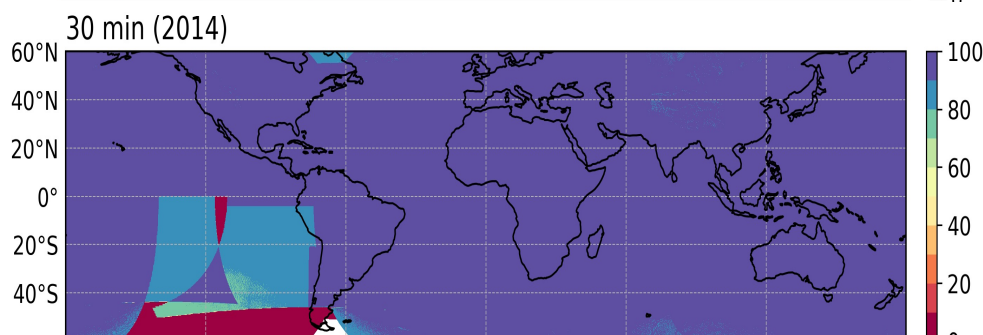
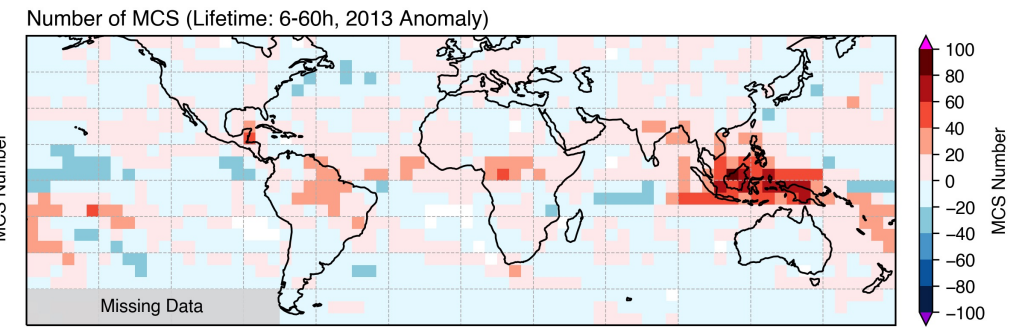
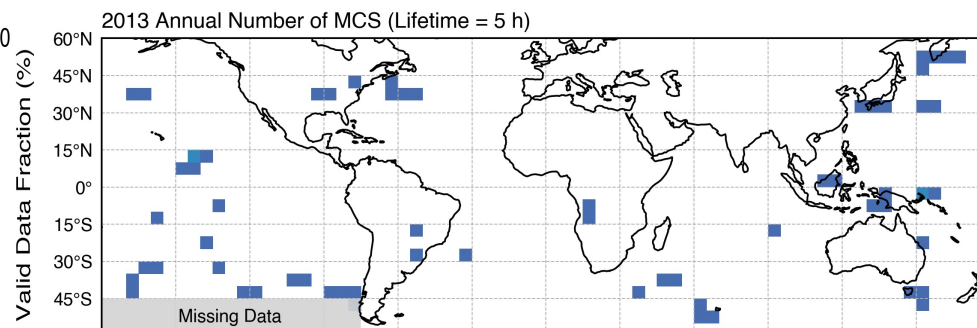
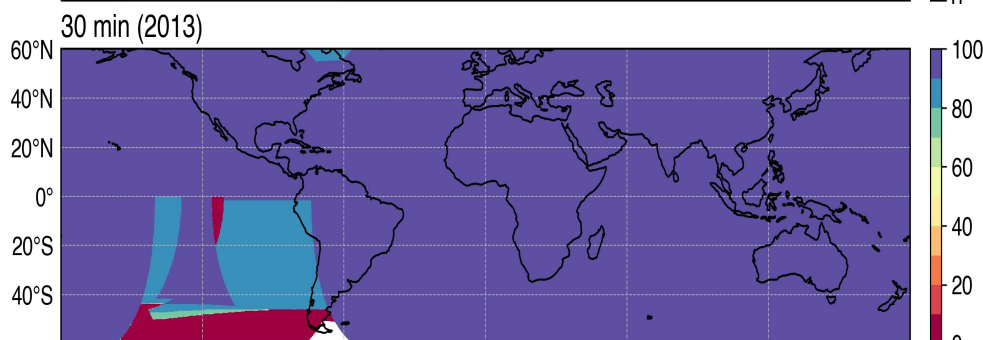
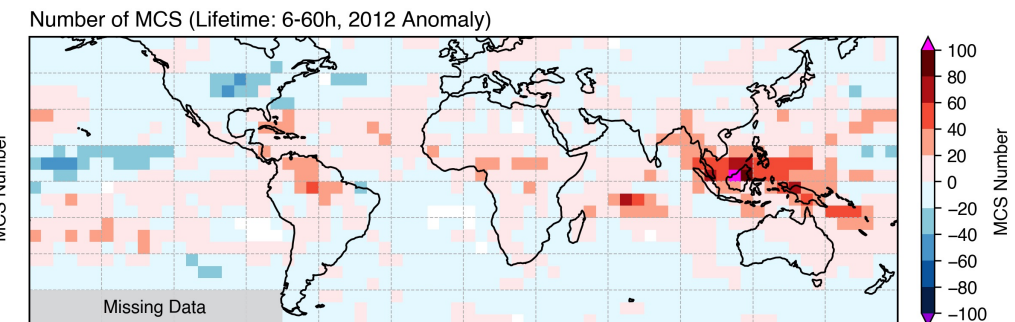
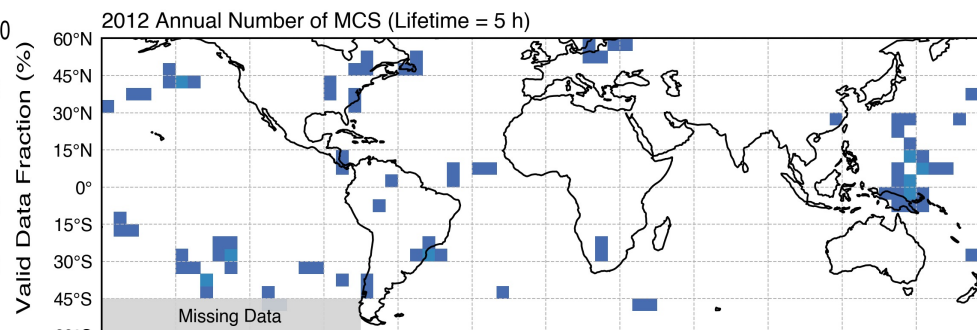
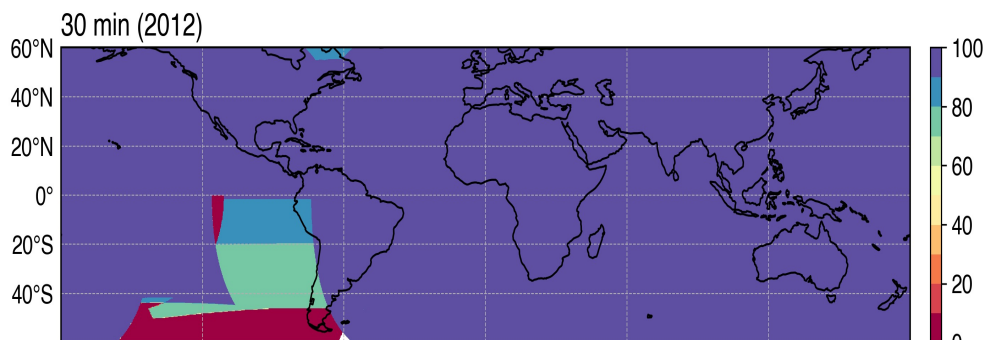
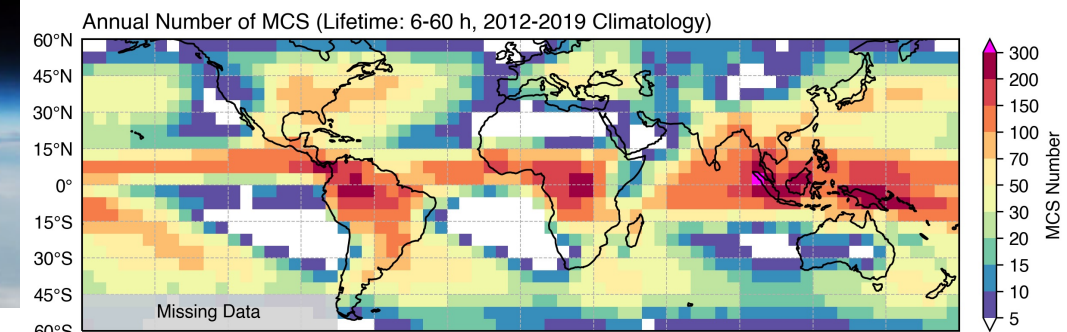
5-h MCS Number





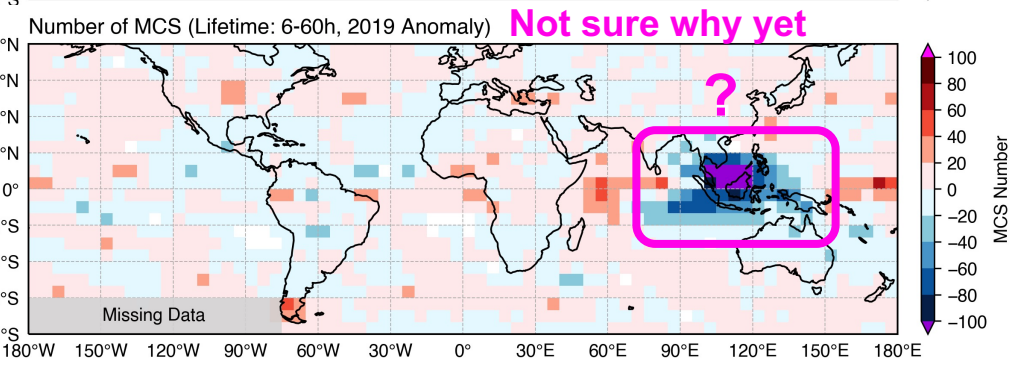
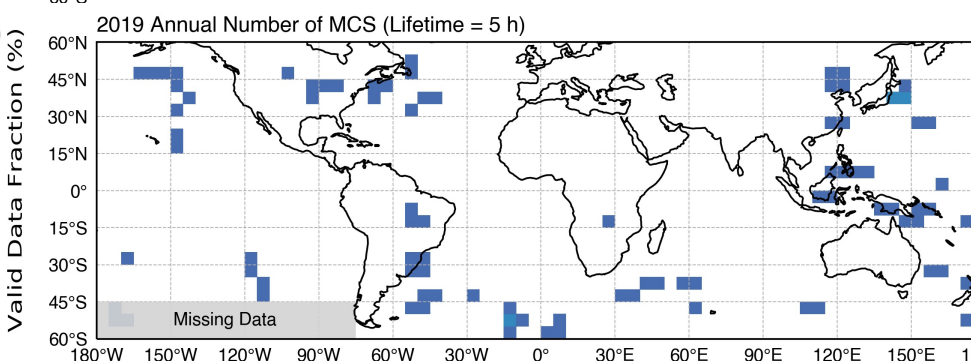
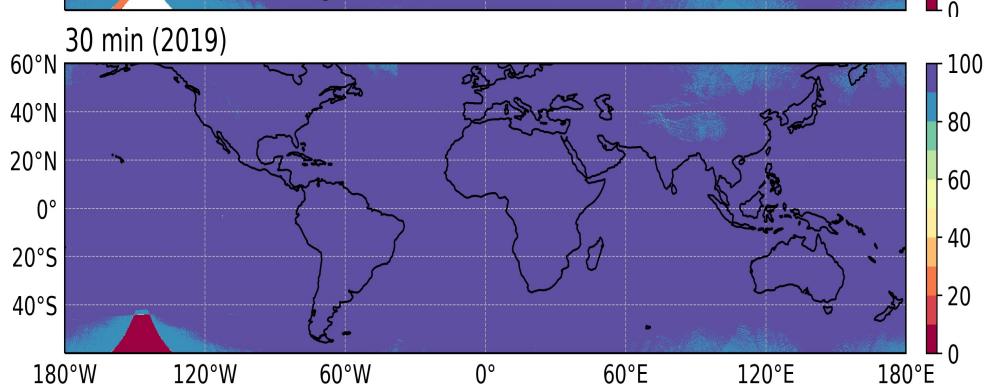
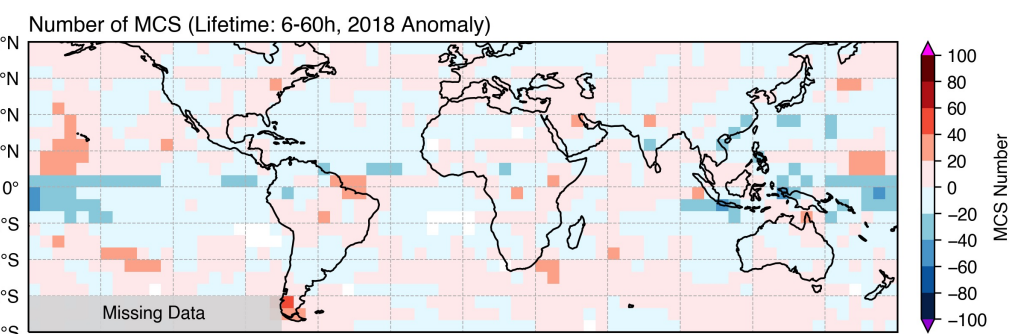
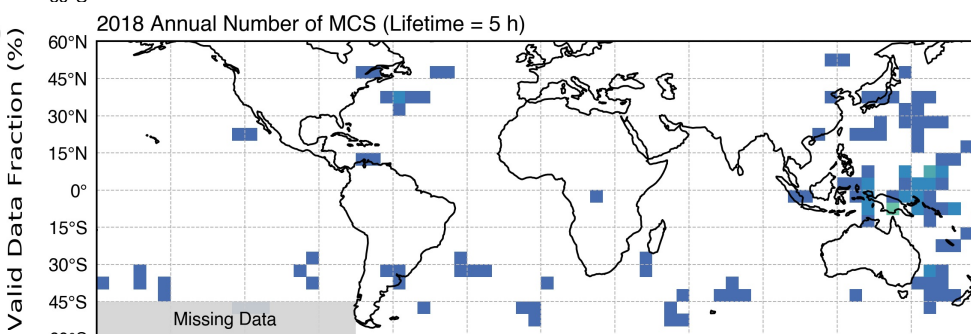
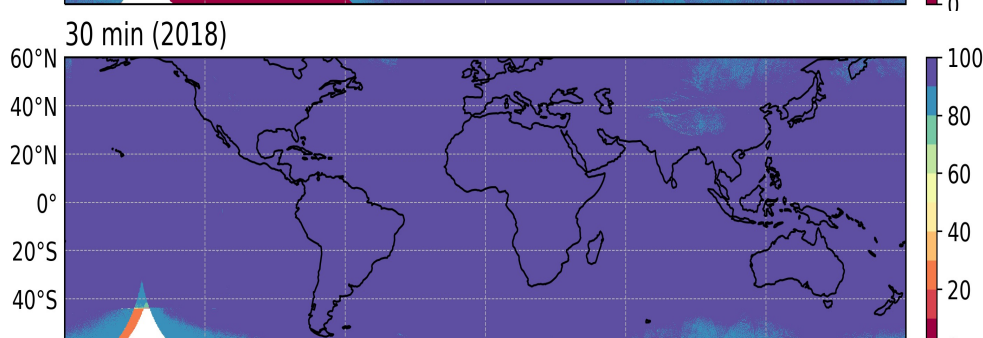
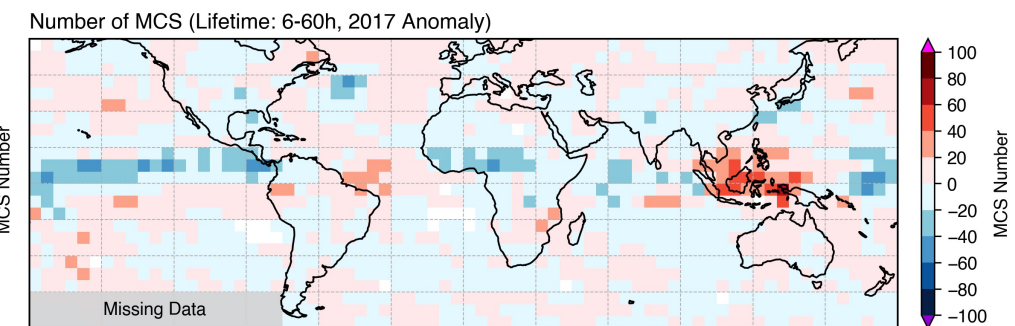
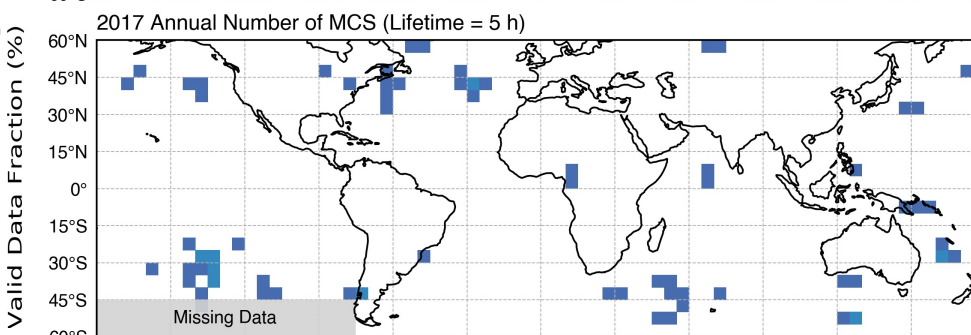
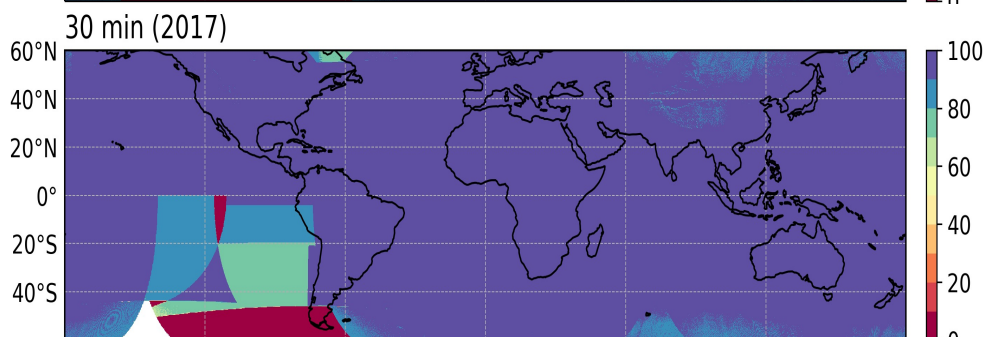
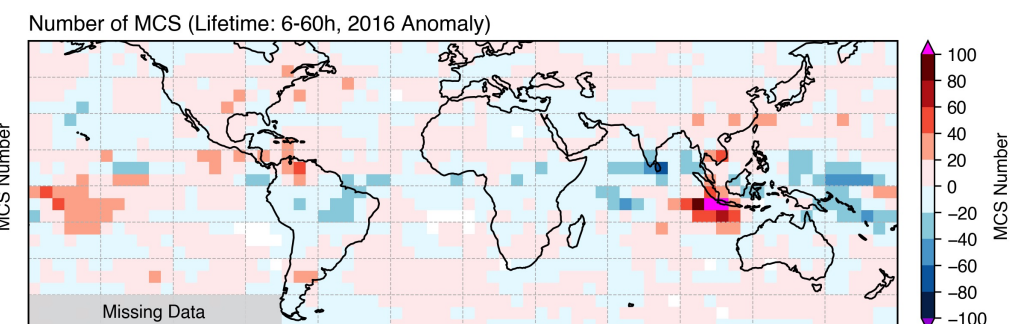
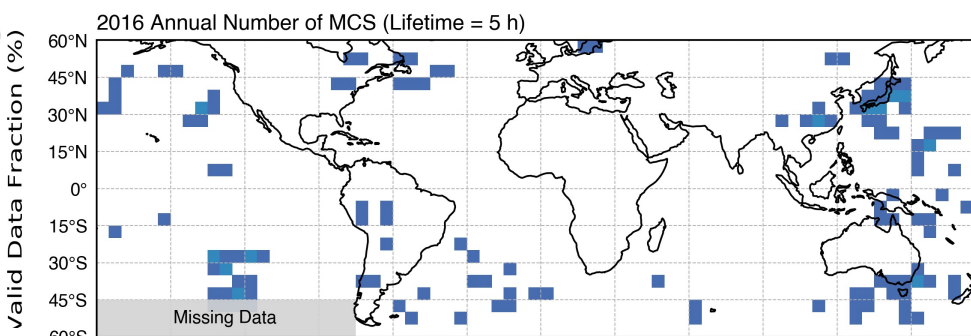
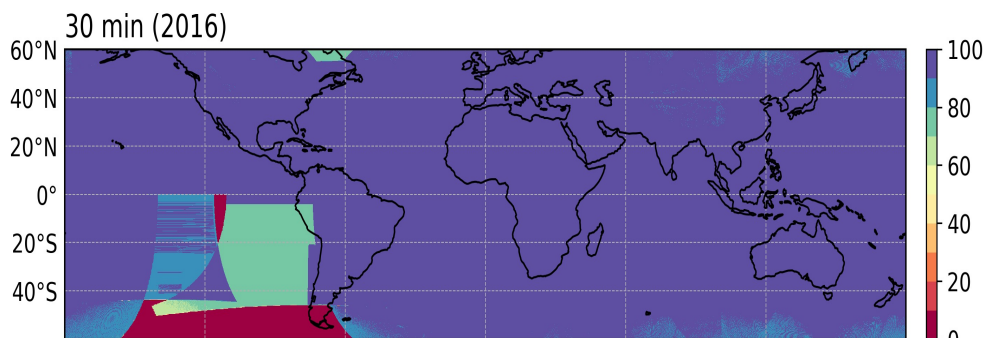
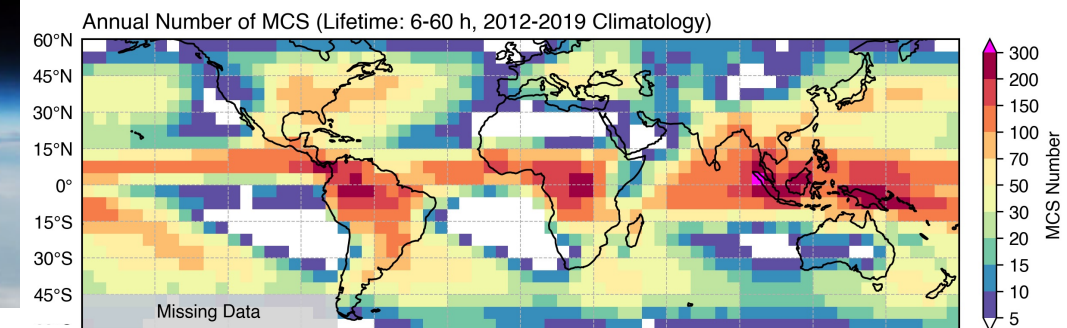
MCS Number (2012-2015)

5-h MCS Number



MCS Number (2016-2019)

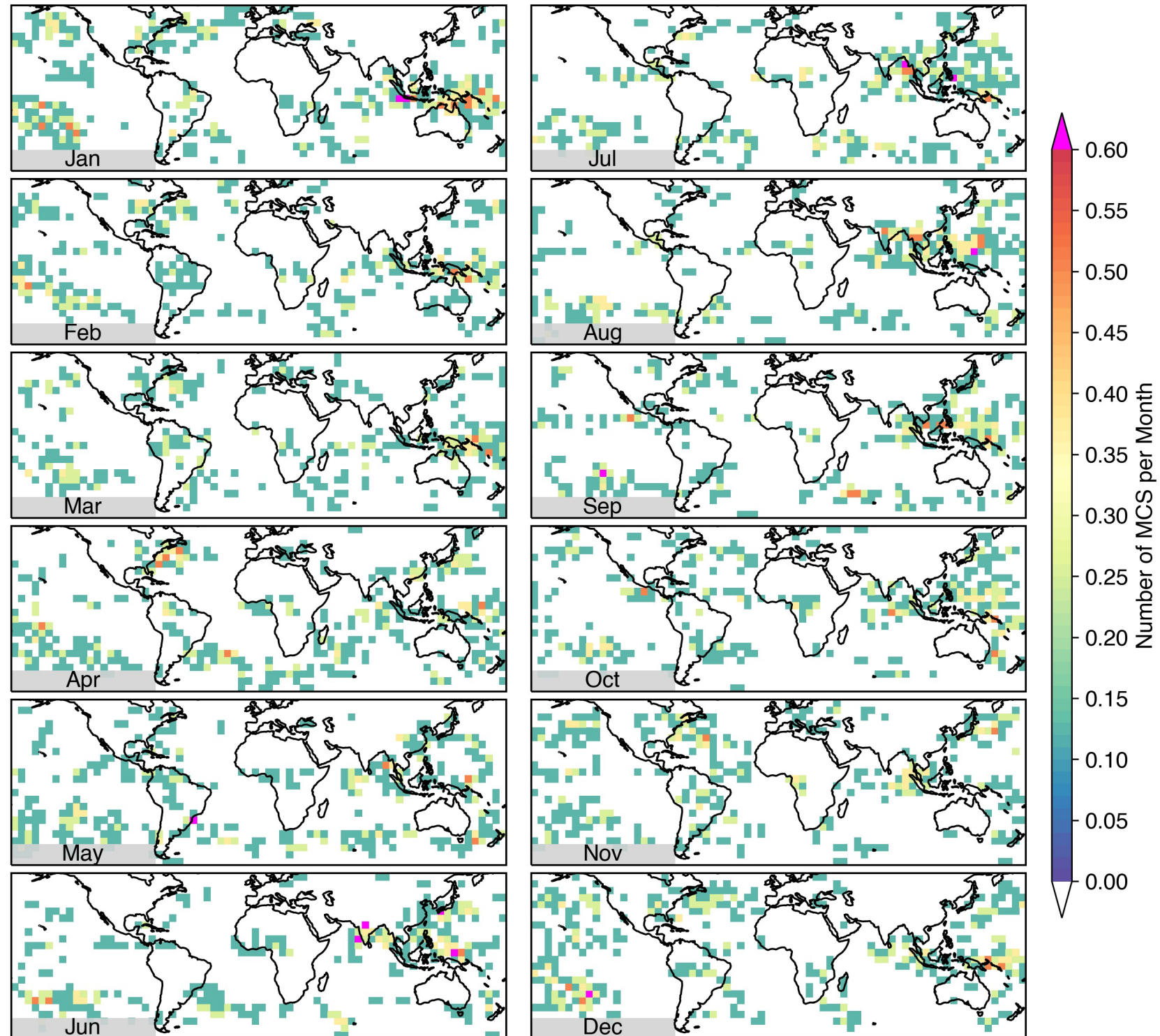
5-h MCS Number



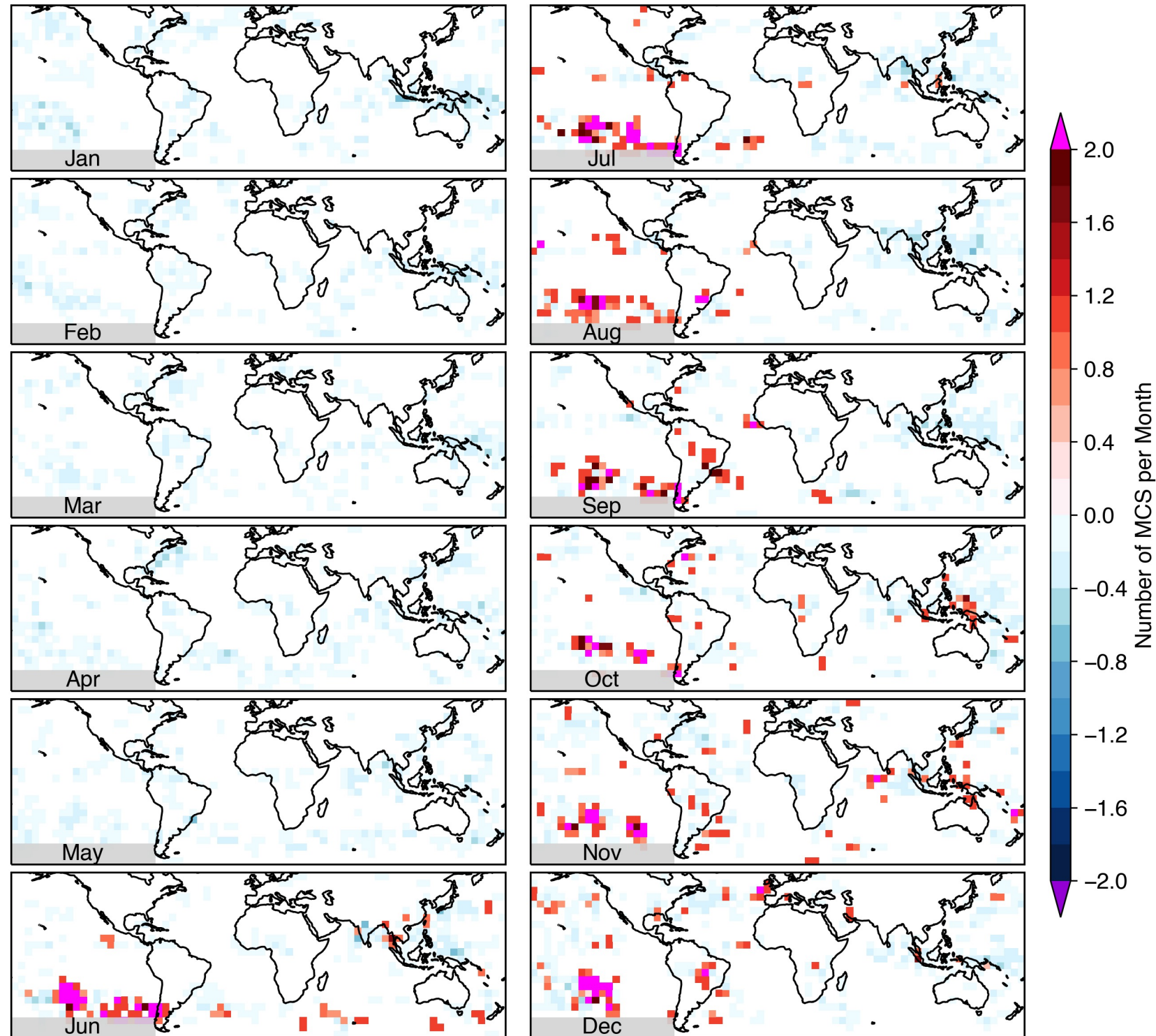
Monthly Anomaly



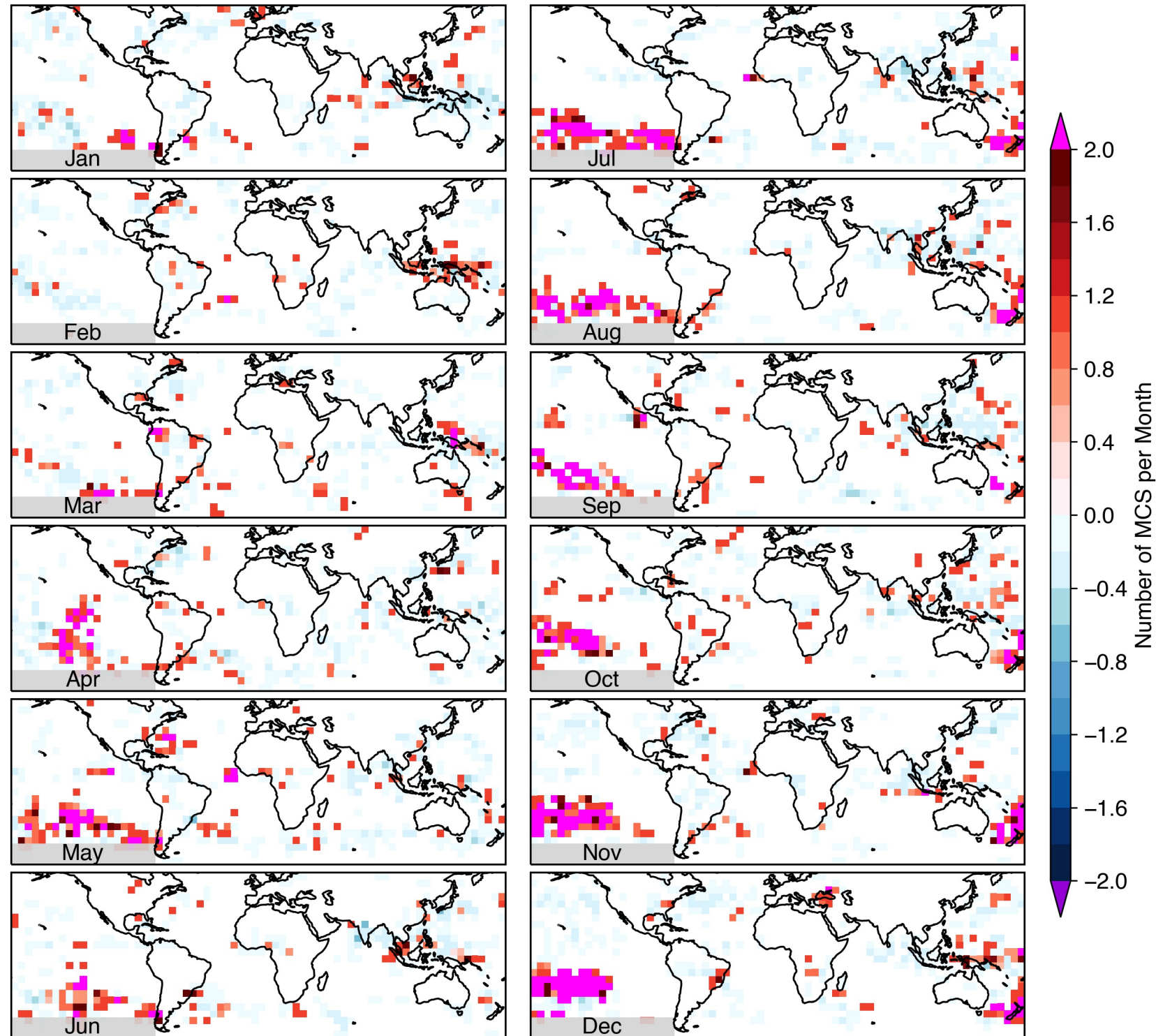
Number of MCS (Lifetime = 5 h, 2012-2019 Climatology)



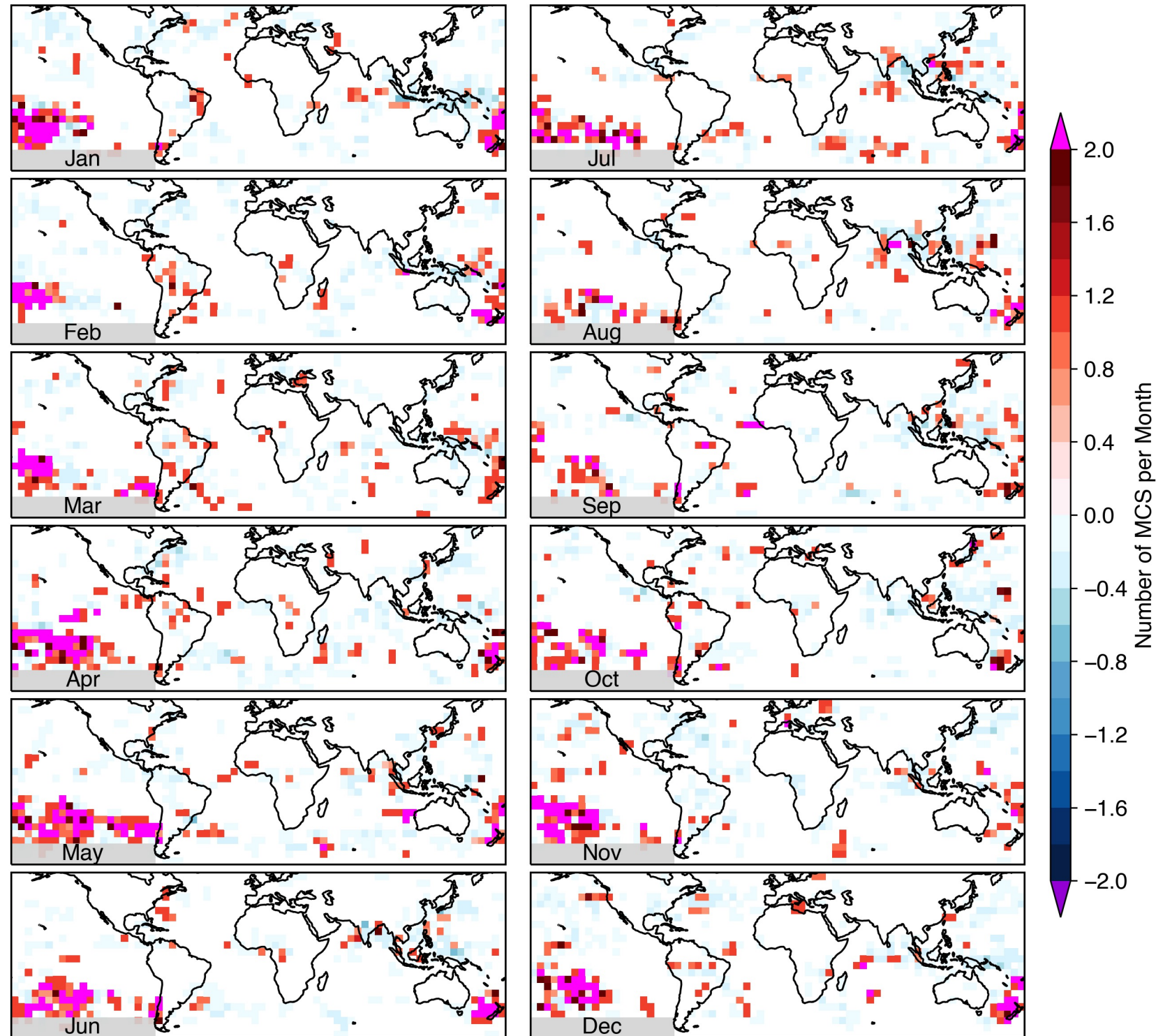
Number of MCS (Lifetime = 5 h, 2000 Anomaly)



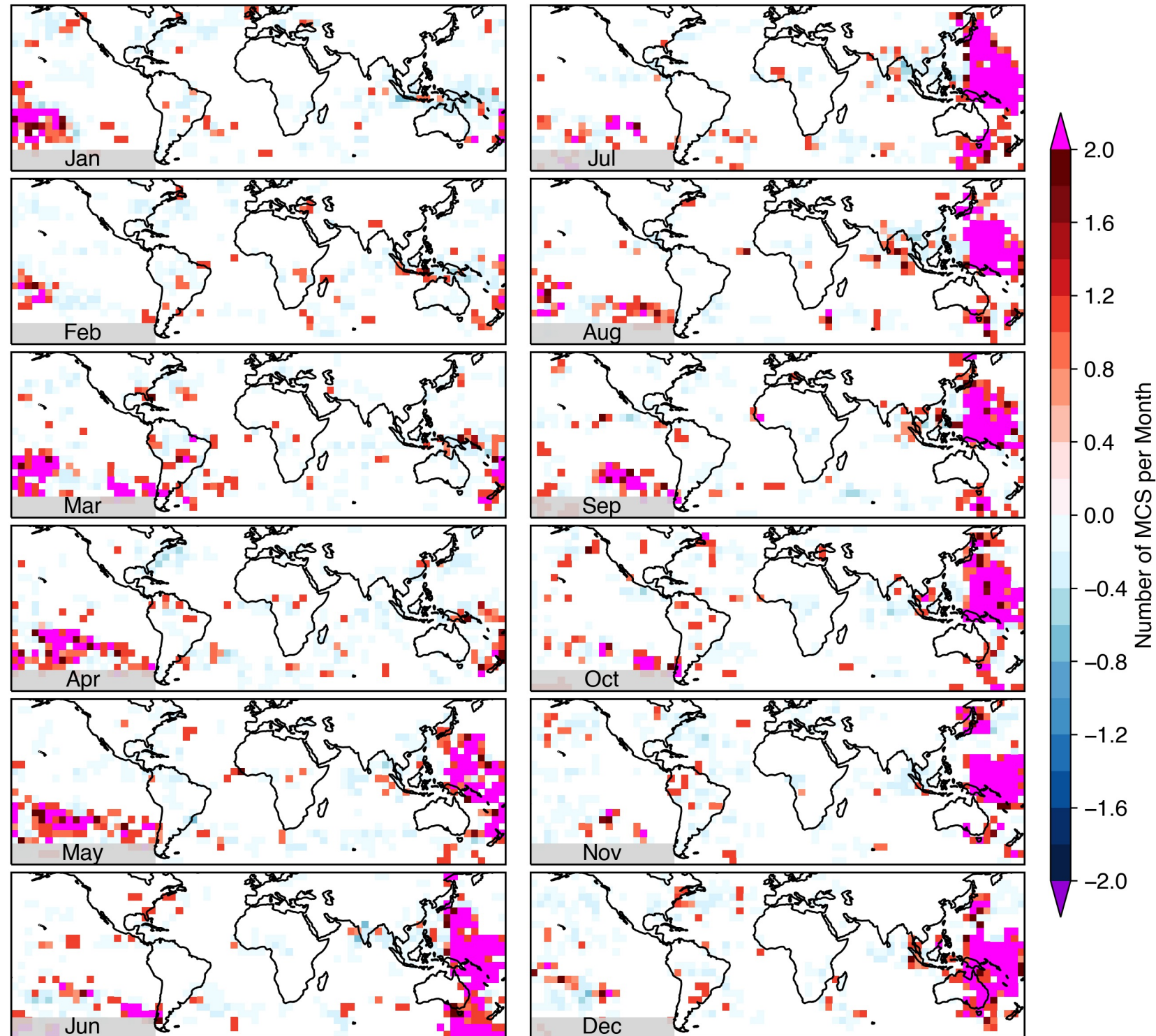
Number of MCS (Lifetime = 5 h, 2001 Anomaly)



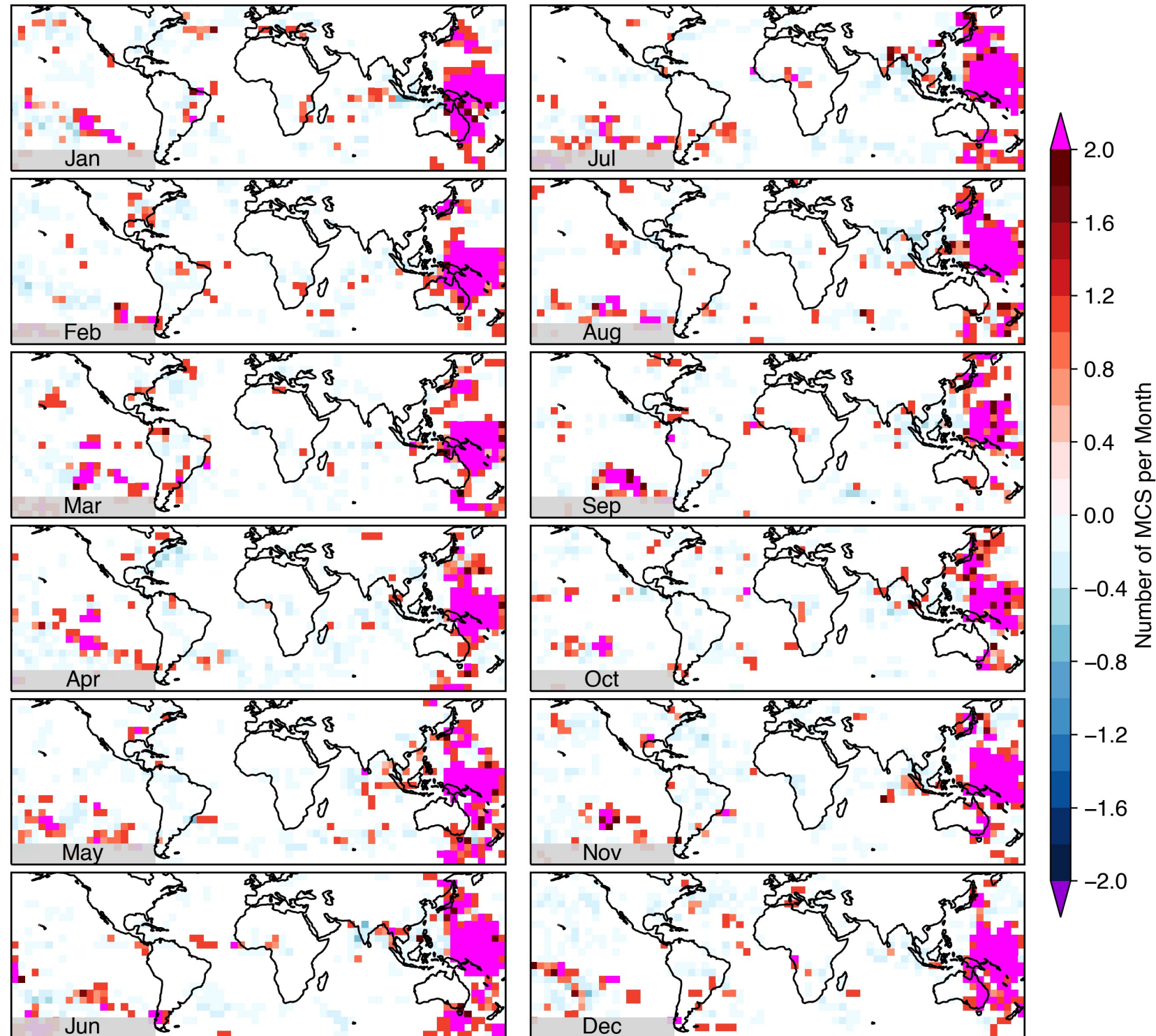
Number of MCS (Lifetime = 5 h, 2002 Anomaly)



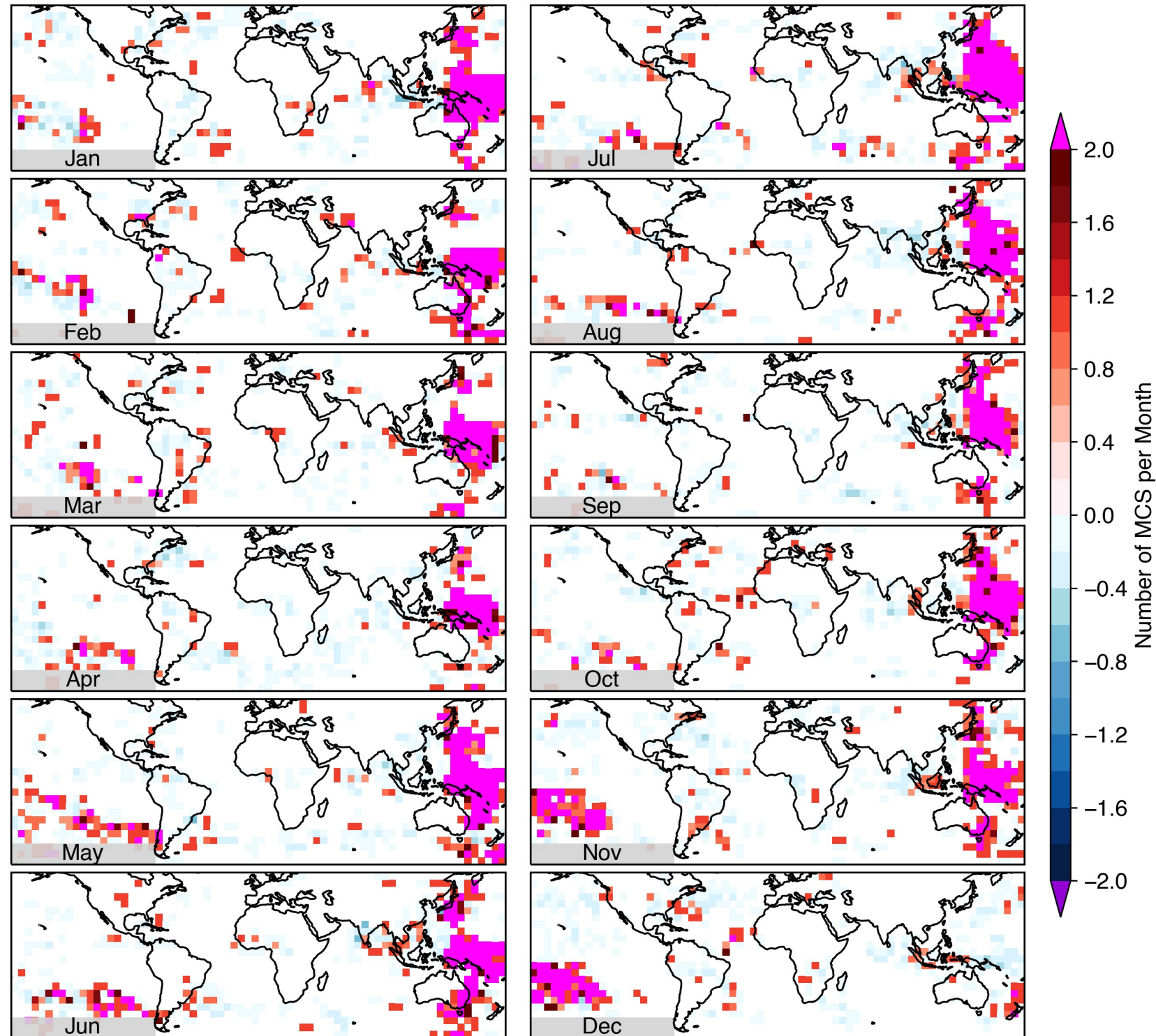
Number of MCS (Lifetime = 5 h, 2003 Anomaly)



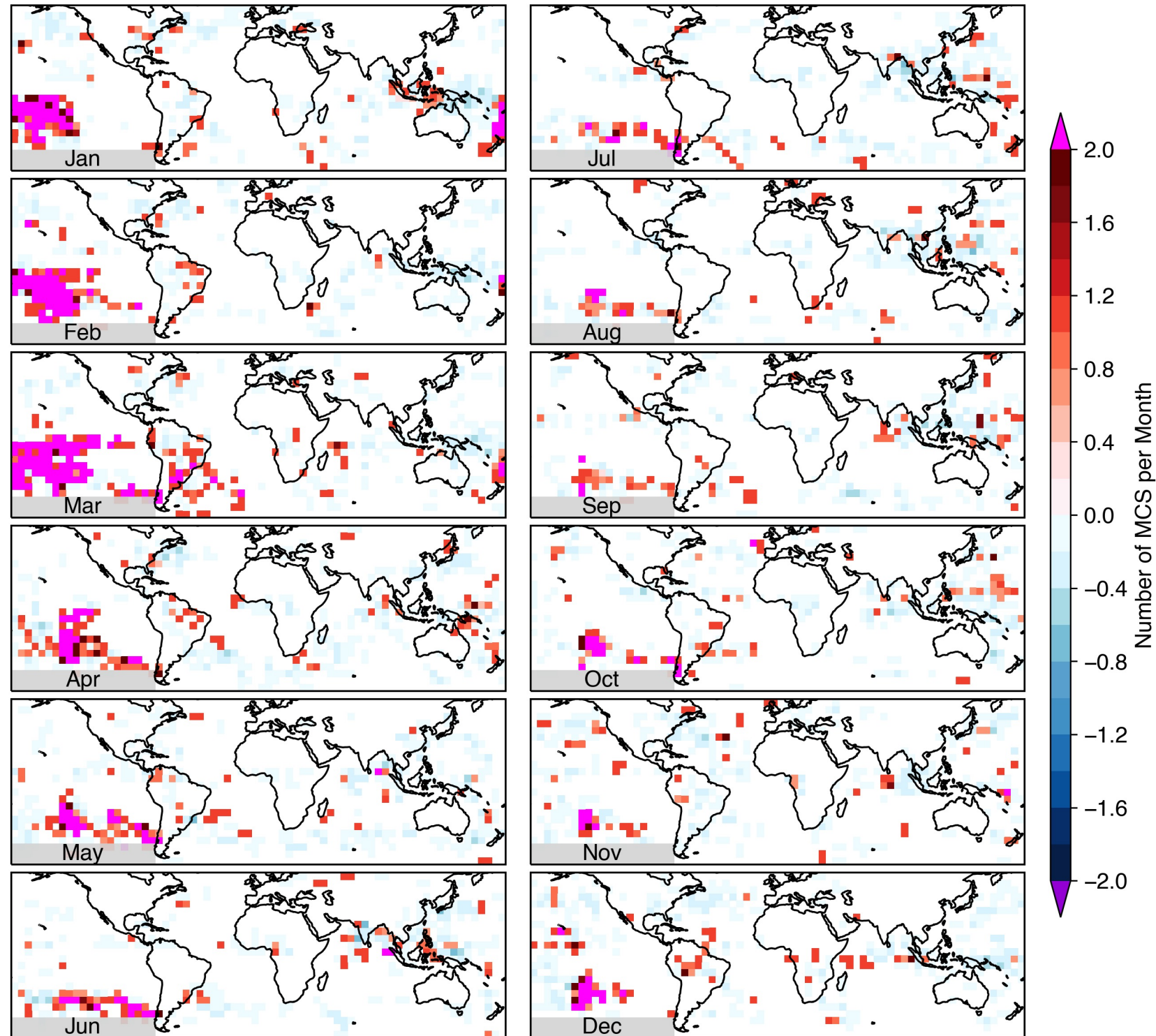
Number of MCS (Lifetime = 5 h, 2004 Anomaly)



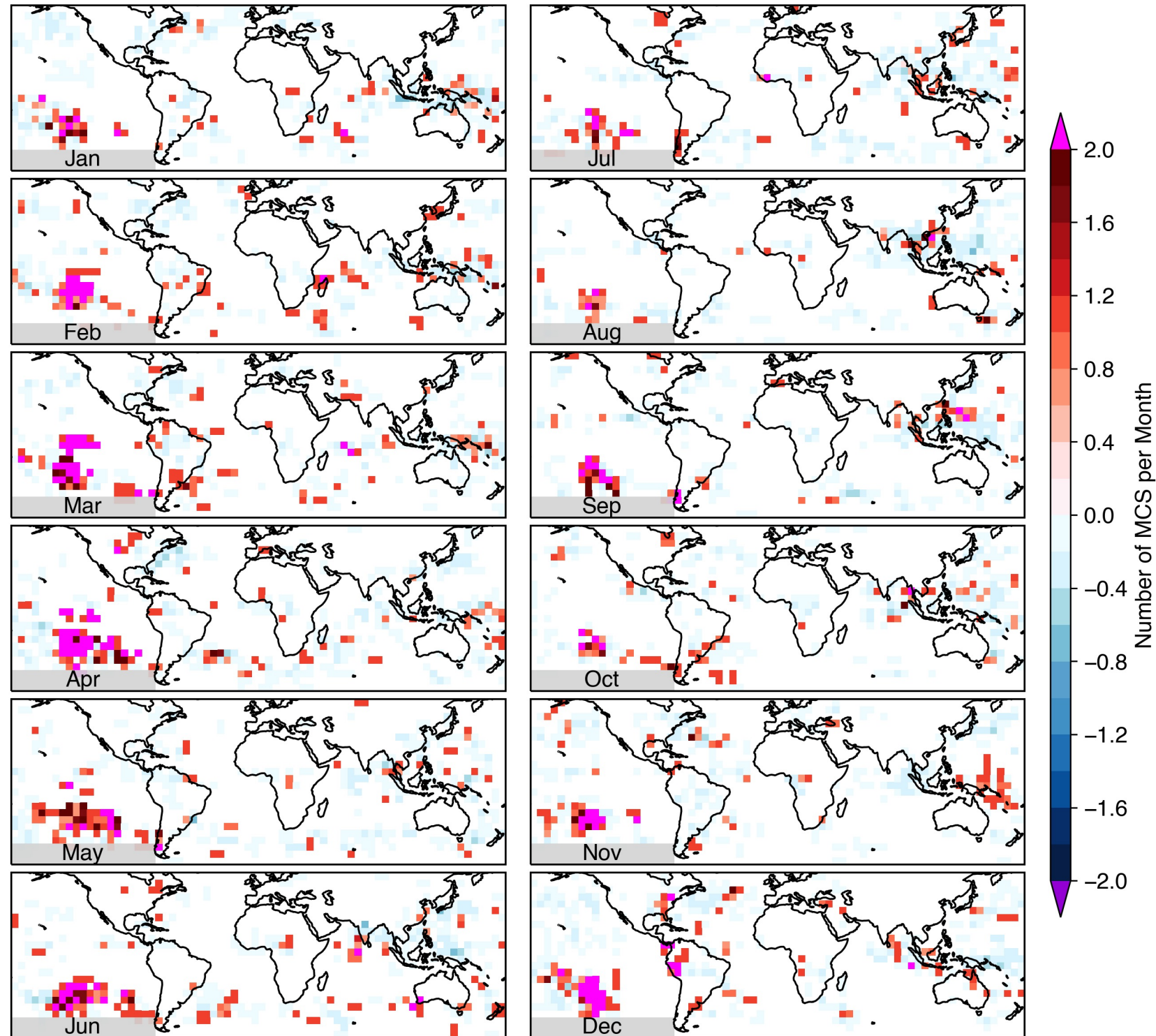
Number of MCS (Lifetime = 5 h, 2005 Anomaly)



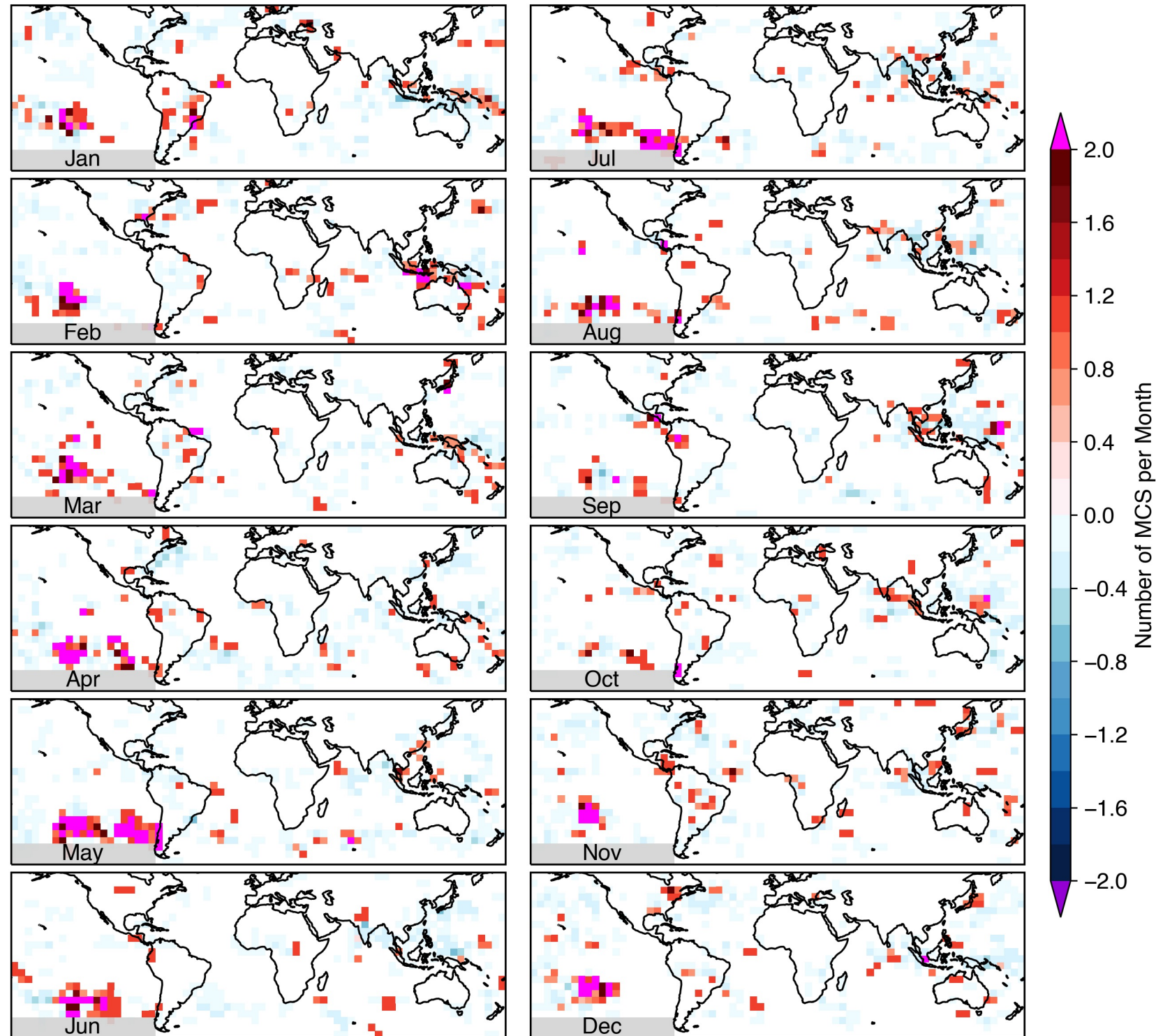
Number of MCS (Lifetime = 5 h, 2006 Anomaly)



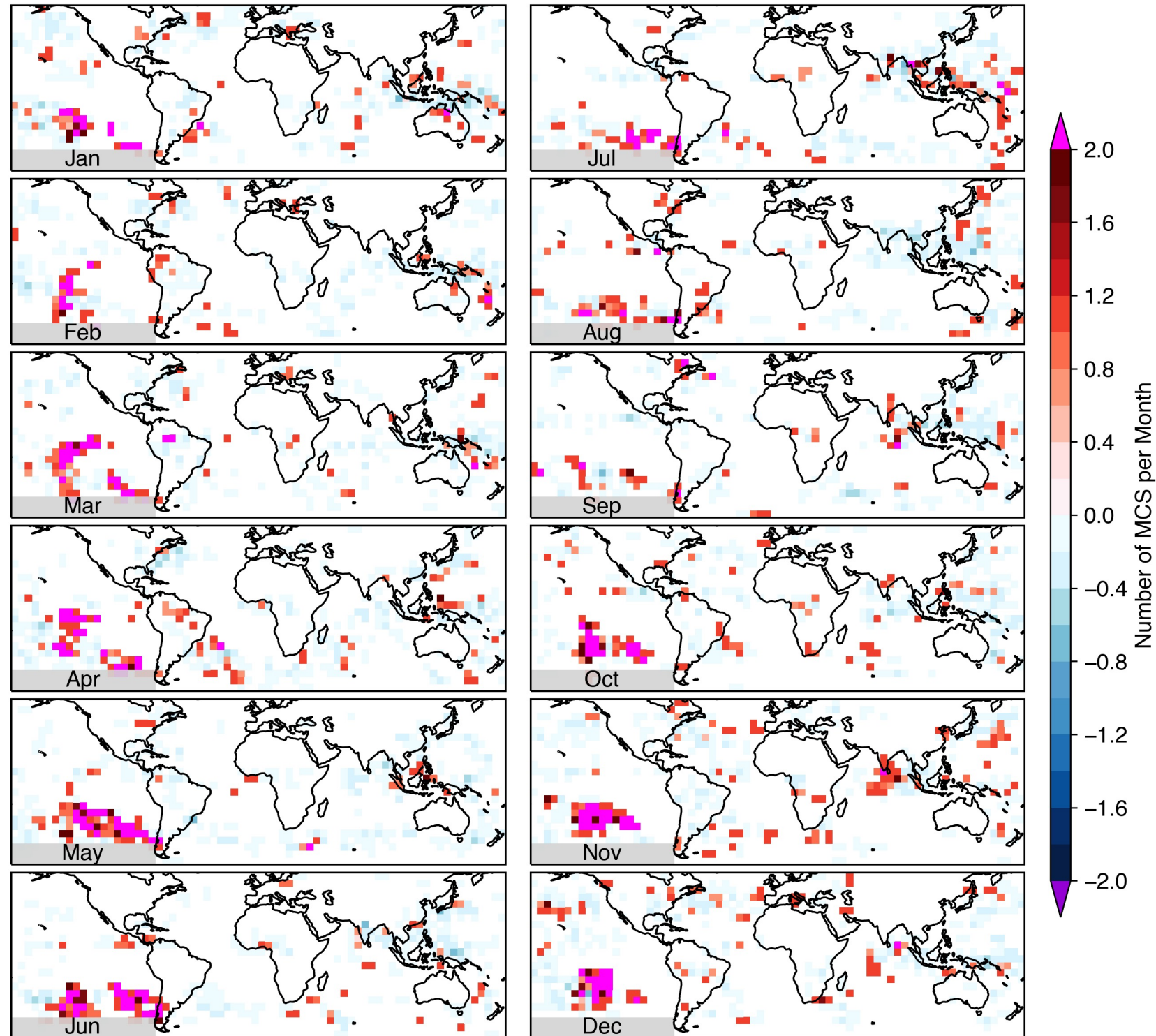
Number of MCS (Lifetime = 5 h, 2007 Anomaly)



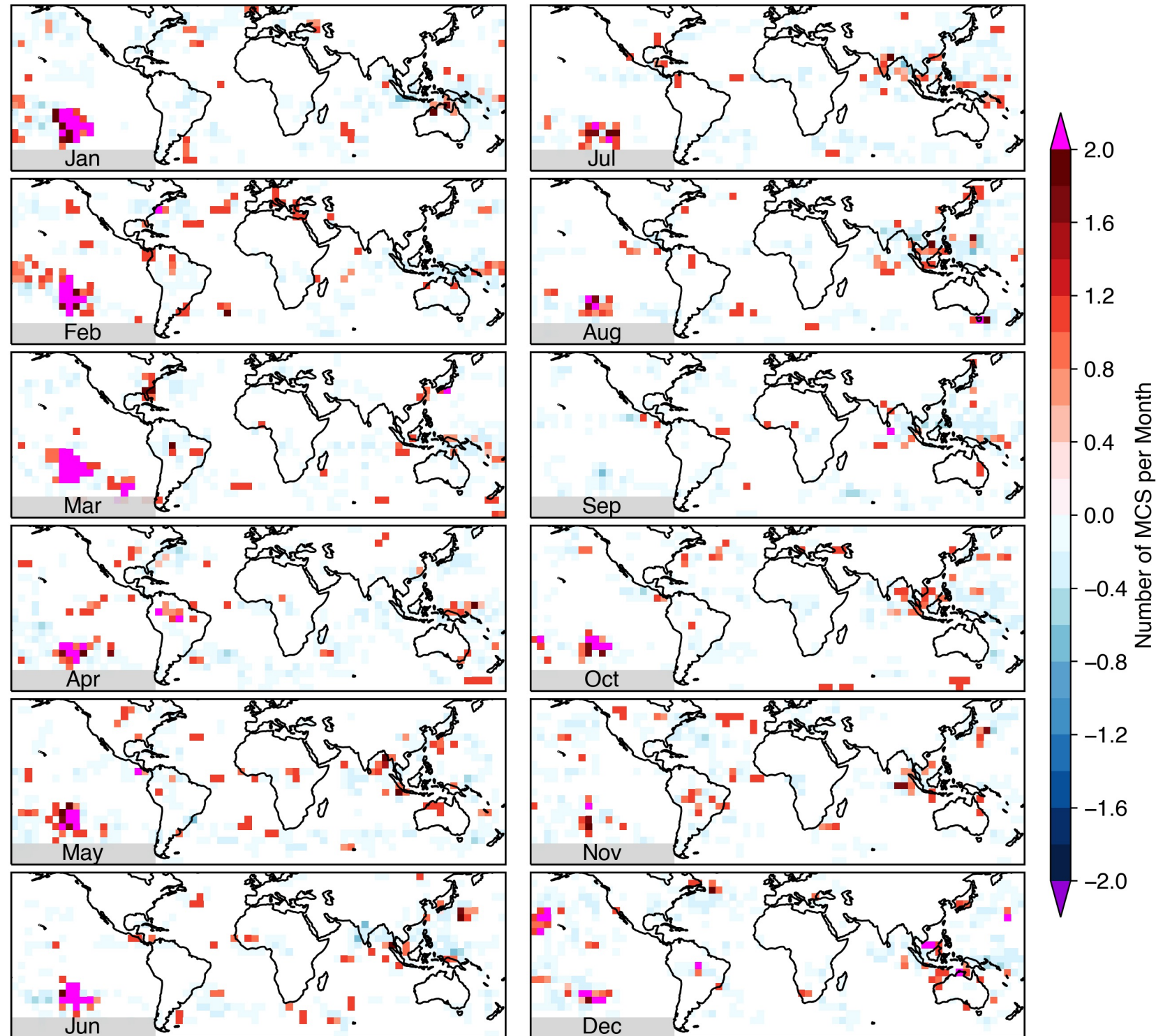
Number of MCS (Lifetime = 5 h, 2008 Anomaly)



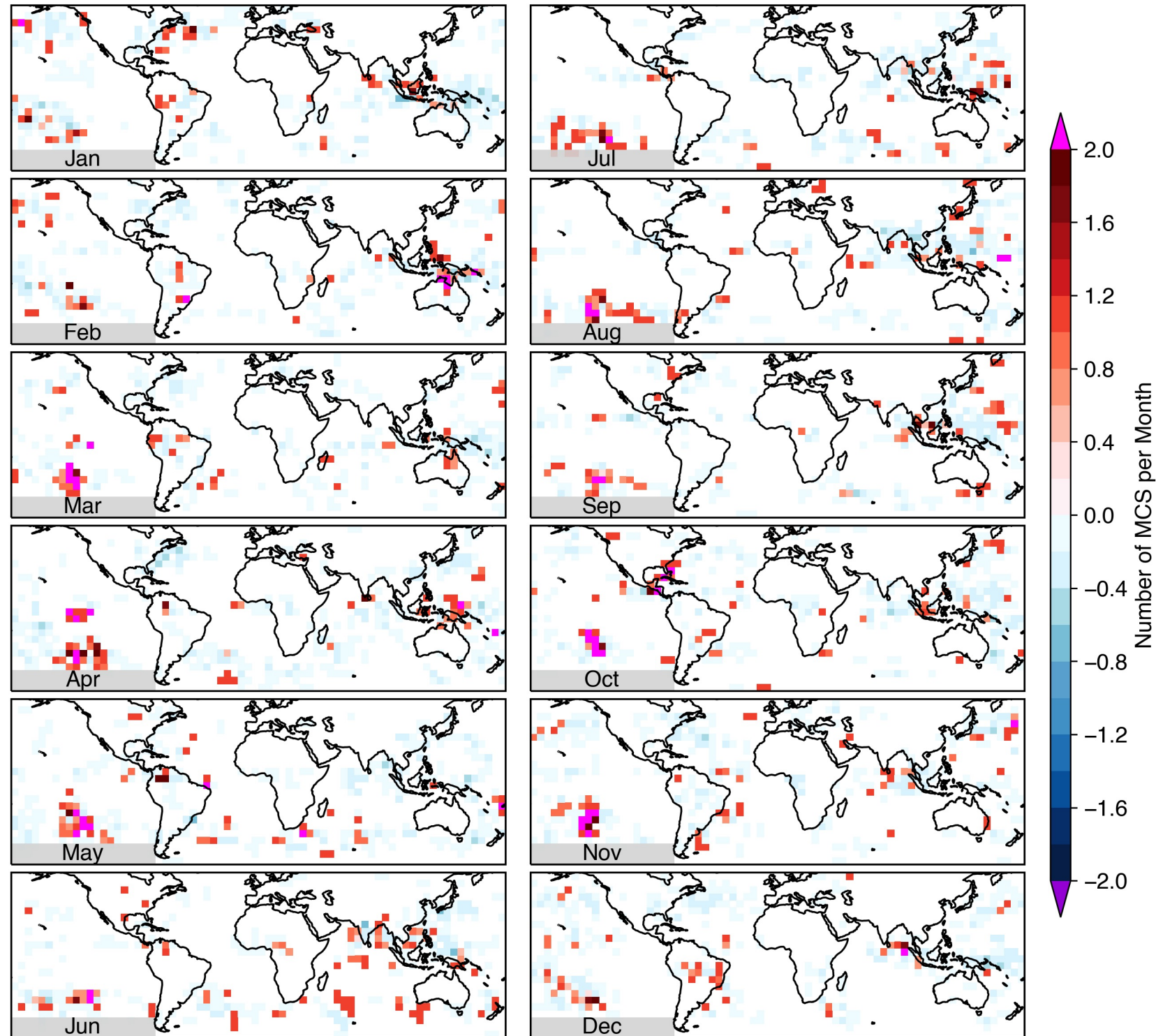
Number of MCS (Lifetime = 5 h, 2009 Anomaly)



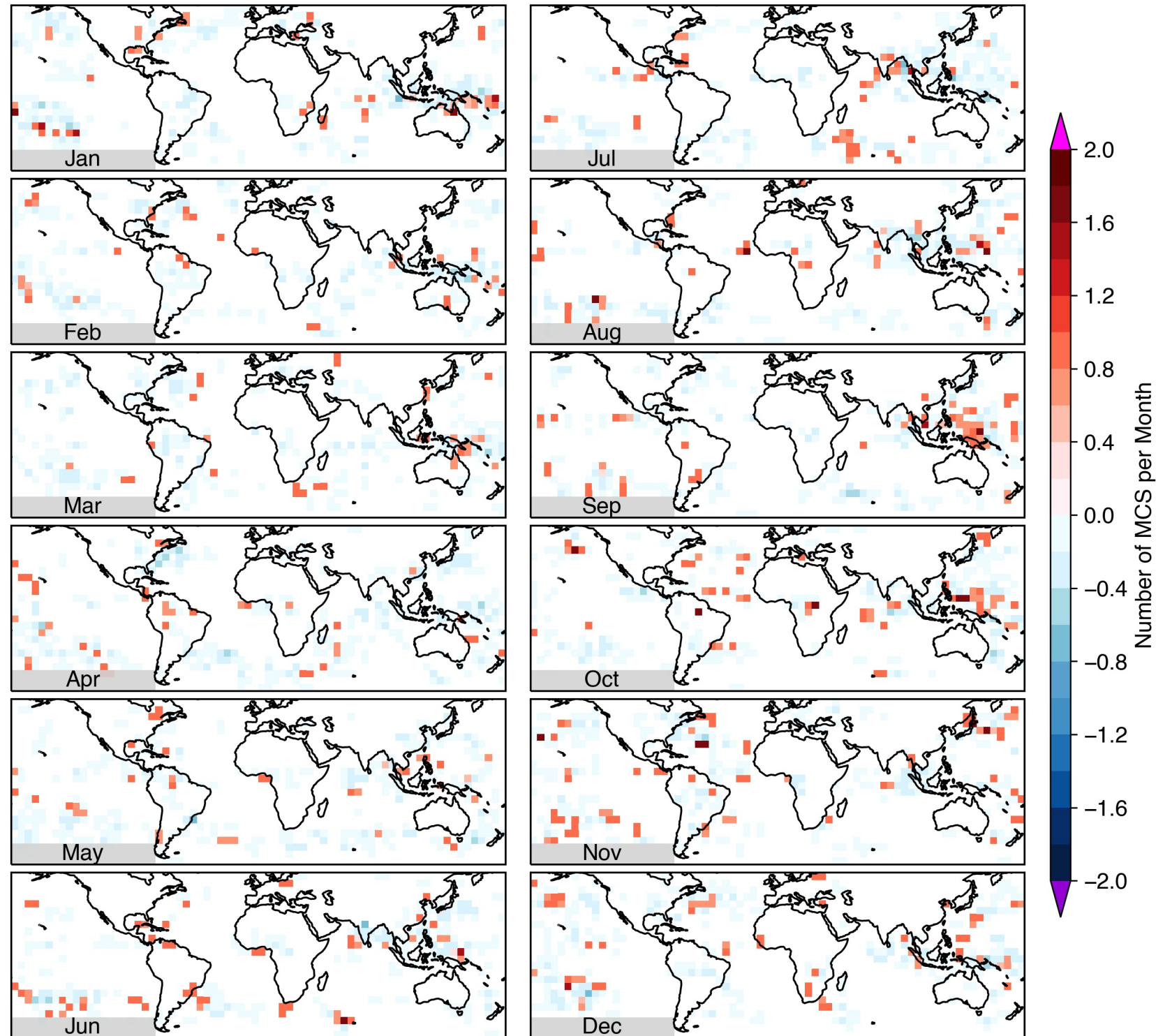
Number of MCS (Lifetime = 5 h, 2010 Anomaly)



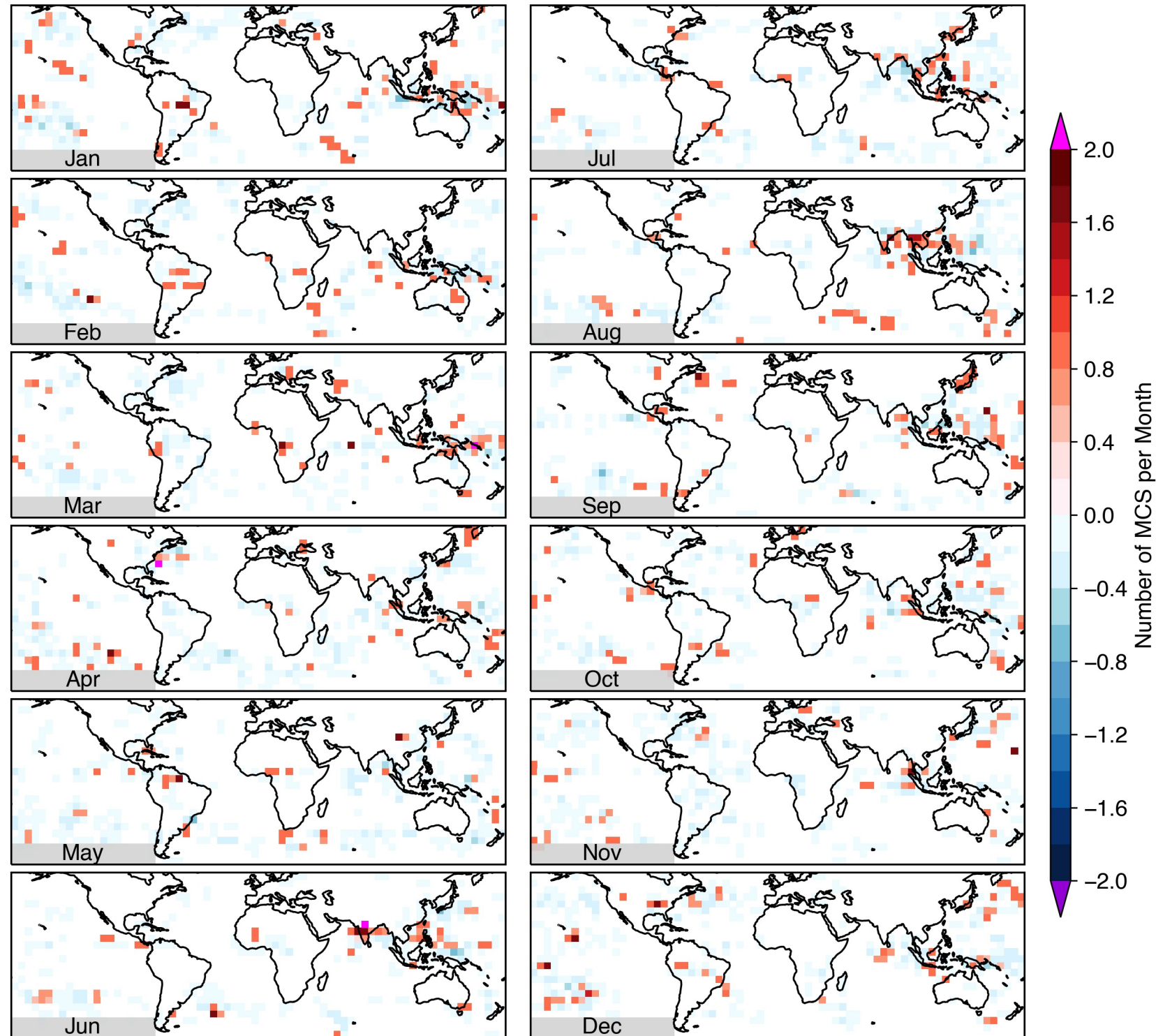
Number of MCS (Lifetime = 5 h, 2011 Anomaly)



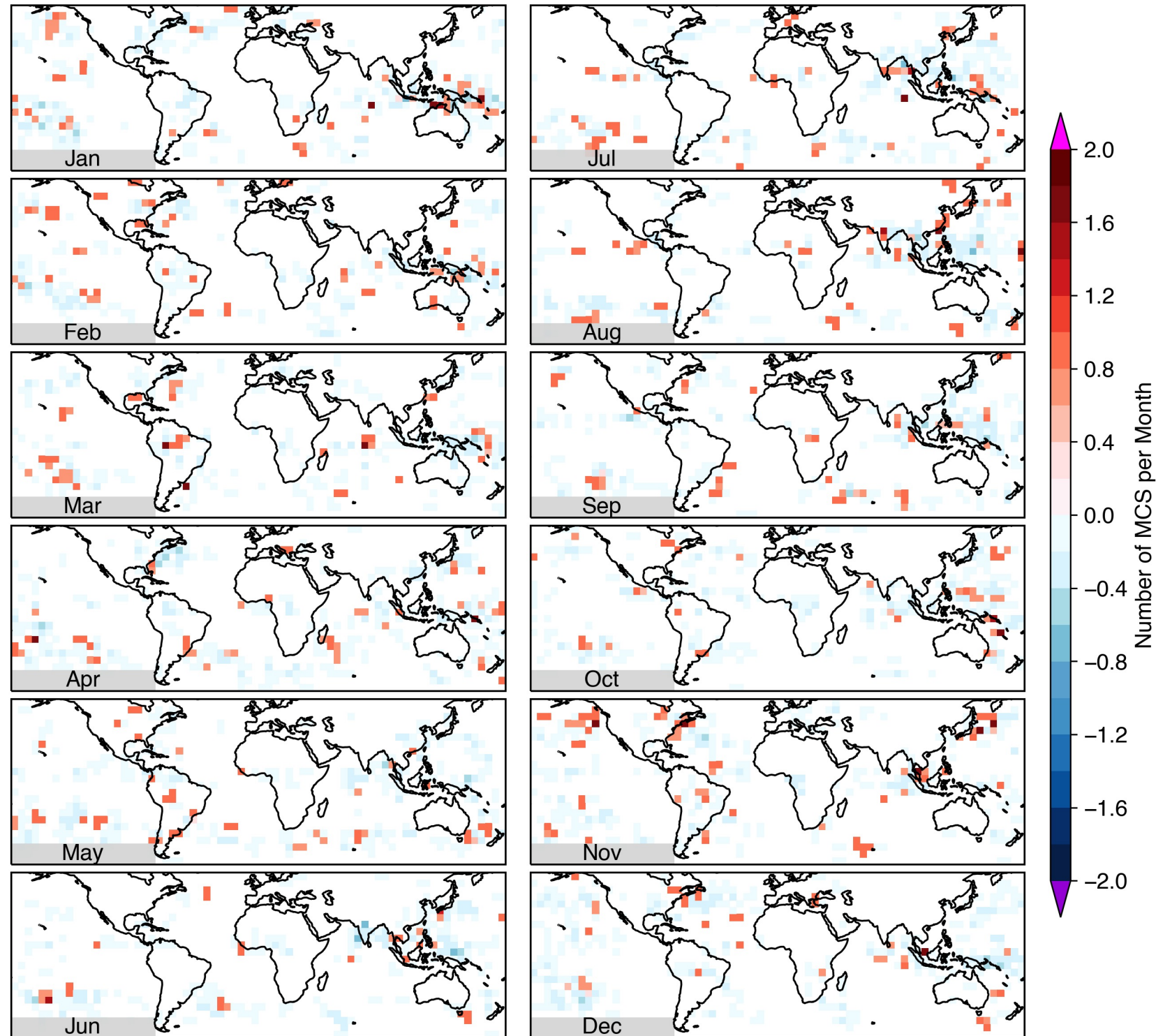
Number of MCS (Lifetime = 5 h, 2012 Anomaly)



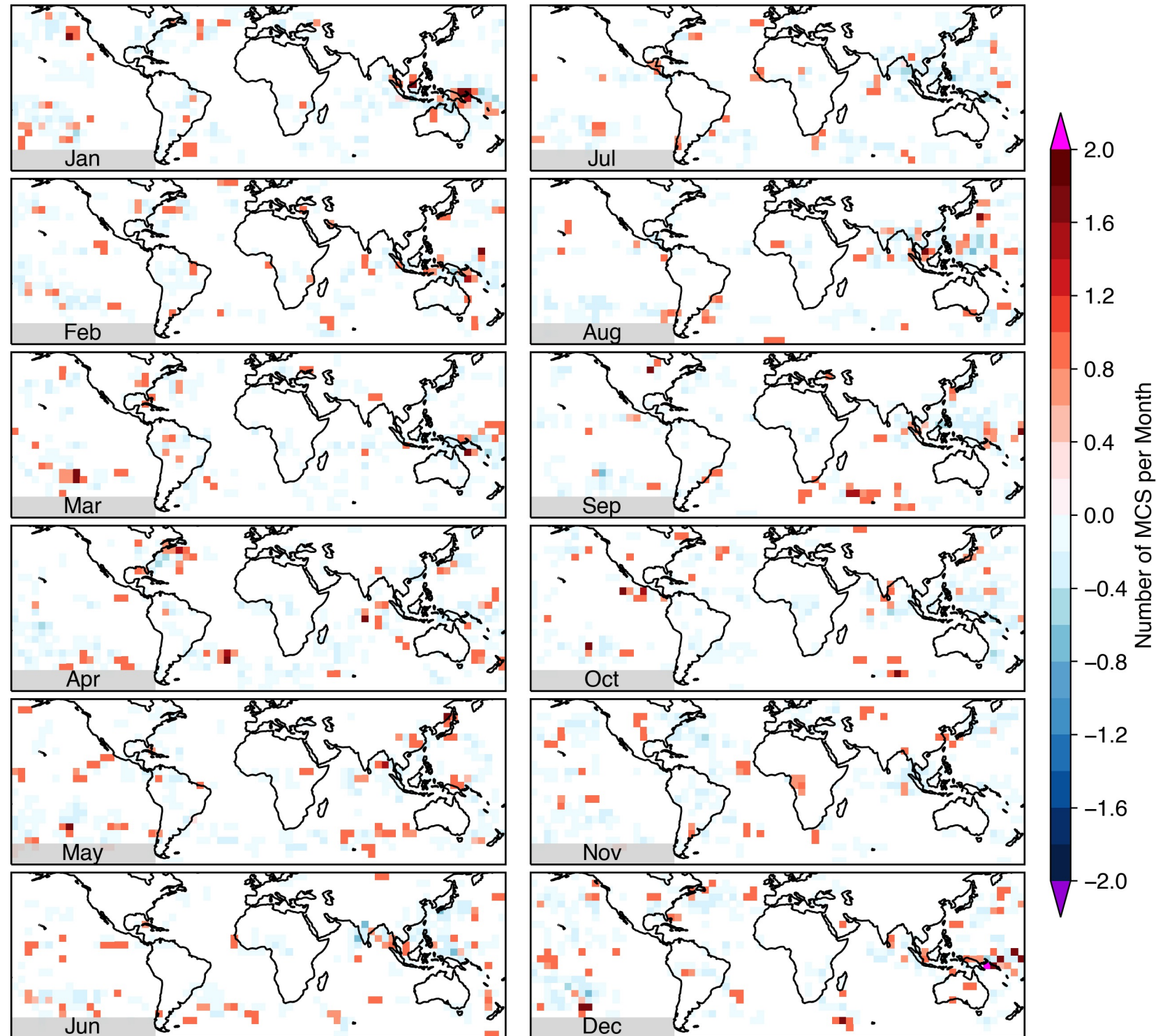
Number of MCS (Lifetime = 5 h, 2013 Anomaly)



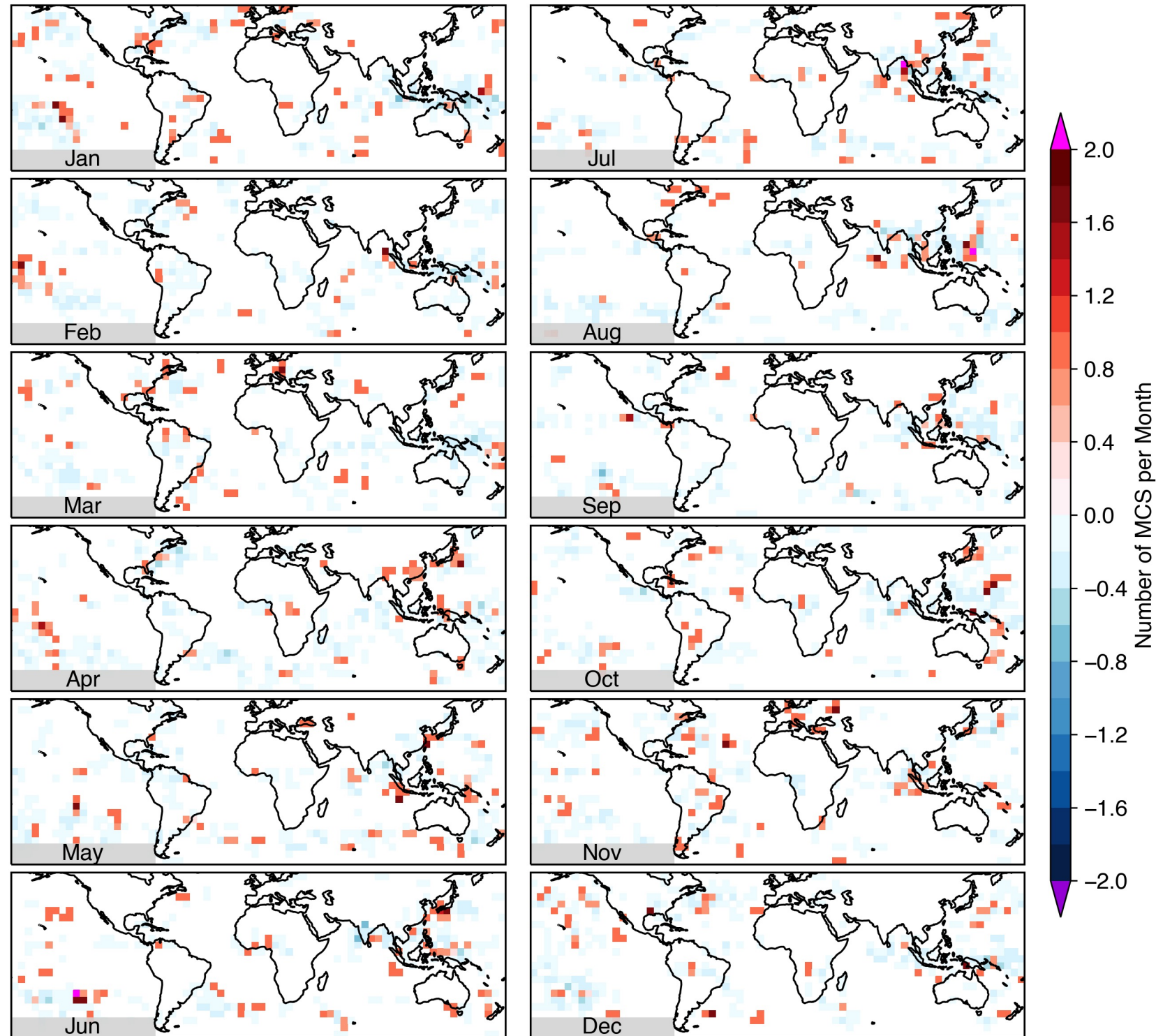
Number of MCS (Lifetime = 5 h, 2014 Anomaly)



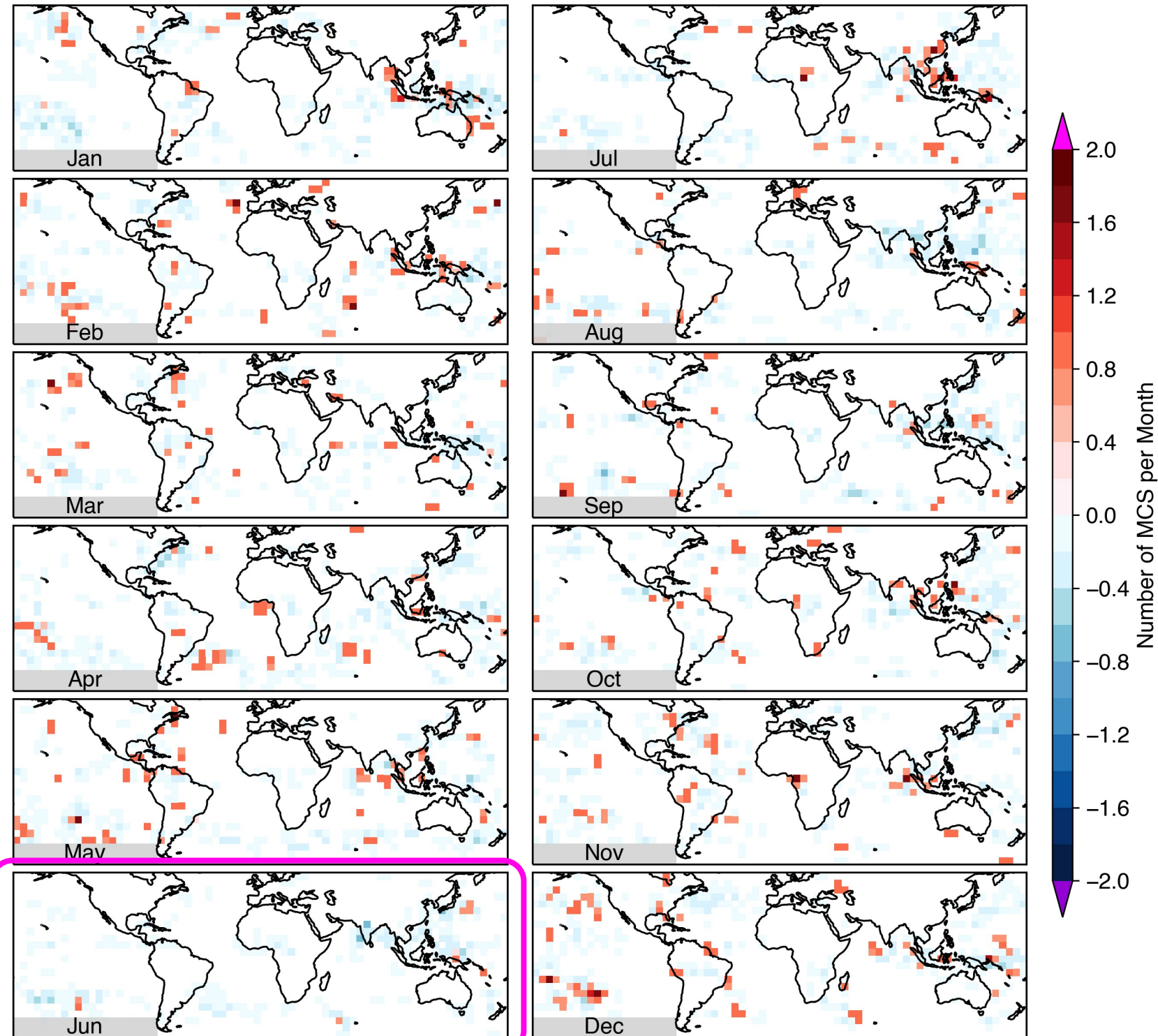
Number of MCS (Lifetime = 5 h, 2015 Anomaly)



Number of MCS (Lifetime = 5 h, 2016 Anomaly)

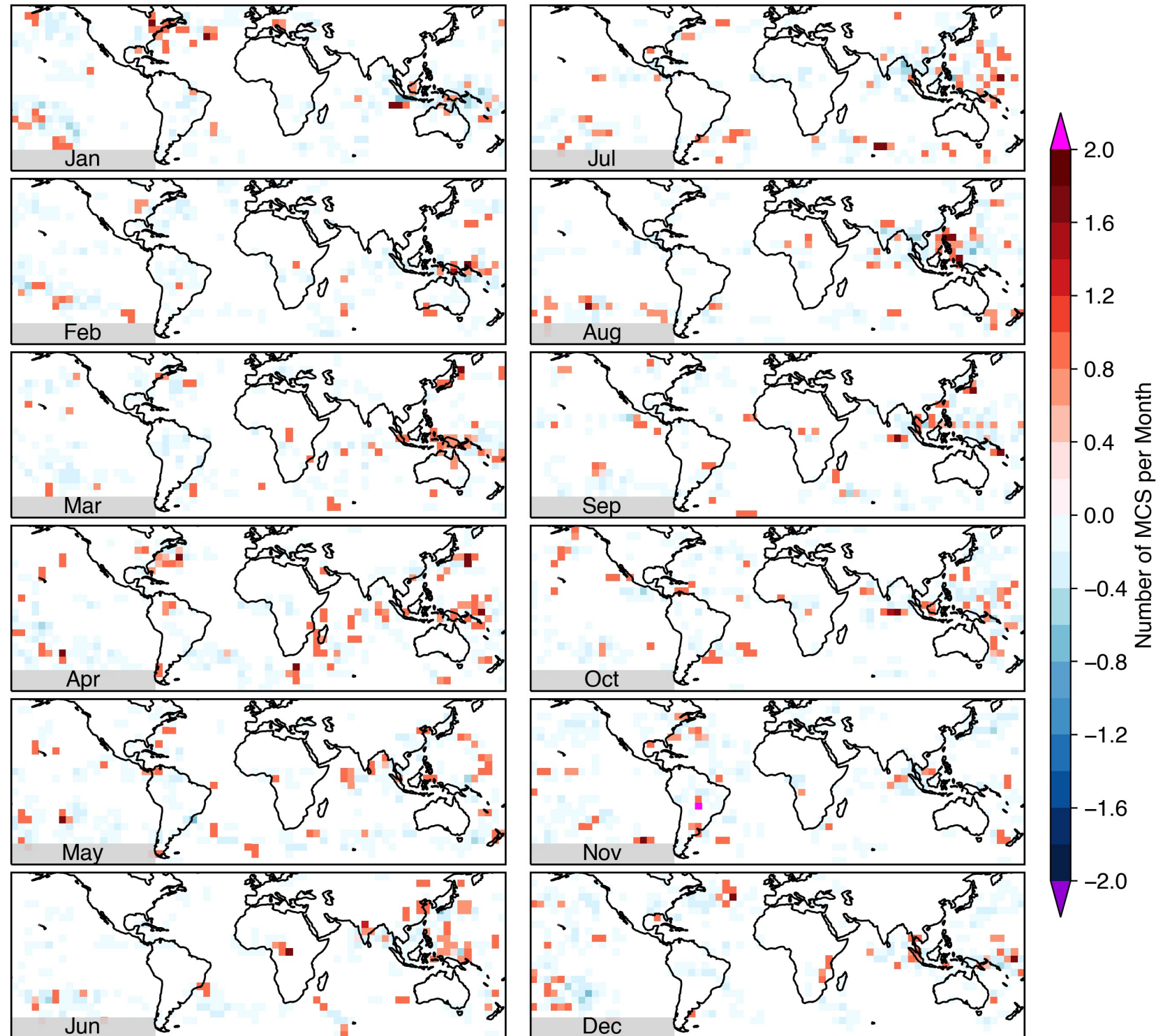


Number of MCS (Lifetime = 5 h, 2017 Anomaly)



Global T_b data
production were
interrupted **June 11-30**,
MCS data in this month
should NOT be used

Number of MCS (Lifetime = 5 h, 2018 Anomaly)



Number of MCS (Lifetime = 5 h, 2019 Anomaly)

