**AIMS**

Specifically, we aim to assess the significance of MHWs (MCSs) within the context of

1. the data sets’ inherent differences;
2. ii) the various dynamical properties that then emerge out of the regional oceanographic context; and
3. out of the local-scale modifications of the regional ocean features as they approach the coast.

In doing so, we wish to provide a mechanistic understanding of the nature and origin of MHWs (MCSs) within oceanographically distinct ocean/coastal regions.

Our predictions are that

1. local coastal MHW events are coupled with offshore broad-scale thermal patterns;
2. MCSs originate at the local scale in the coastal *in situ* dataset as isolated incidents decoupled from broader-scale patterns;
3. different coastal sections, each variously influenced interactions between local- and broad-scale processes, display different dynamics (timing, frequency, duration and intensity) of MHWs and MCSs; and
4. the frequency of warm (cold) events will increase (decrease) with time under a regime of climate change.

**RESULTS**

**Events**

*Frequency*

OISST has more MHWs and MCSs than *in situ* dataset

Same number of MHW and MCS in both datasets

All coasts have same number of MHWs and MCSs, irrespective of dataset

*Duration*

OISST have longer MHWs and MCSs

MHWs and MCSs last longest along the east coast *in situ* dataset

OISST MHWs and MCSs also shortest along east coast

Only in the OISST dataset along the east coast are MCSs longer than the MHWs

*Intensity*

MHWs more intense in *in situ* data compared to OISST

In OISST data, MCSs are more intense than MHWs

South coast has most intense MHWs and MCSs in *in situ* data

In OISST data, MCSs more intense MCSs along south coast

In OISST data, MHWs least intense along east coast

MHWs more intense than MCSs along west and east coasts in *in situ* data

MCSs more intense than MHWs along south coast in *in situ* data

In OISST data, only along the east coast are MCSs more intense than MHWs

The mean cumulative intensity of MHWs and MCSs is higher in the *in situ* data

**Top-three events**

MHWs in *in situ* data: south coast > west coast > east coast

MCS in *in situ* data: south coast > west coast > east coast

MHW in OISST data: (south coast and west coast) > east coast

The largest events in the two sets of data do not coincide

**Co-occurrence rates**

South coast has greatest amount of co-occurrence, and west coast least

No difference in co-occurrences between MCSs and MHWs

Decadal trends in MHWs and MCSs

Offshore MHWs and MCSs