

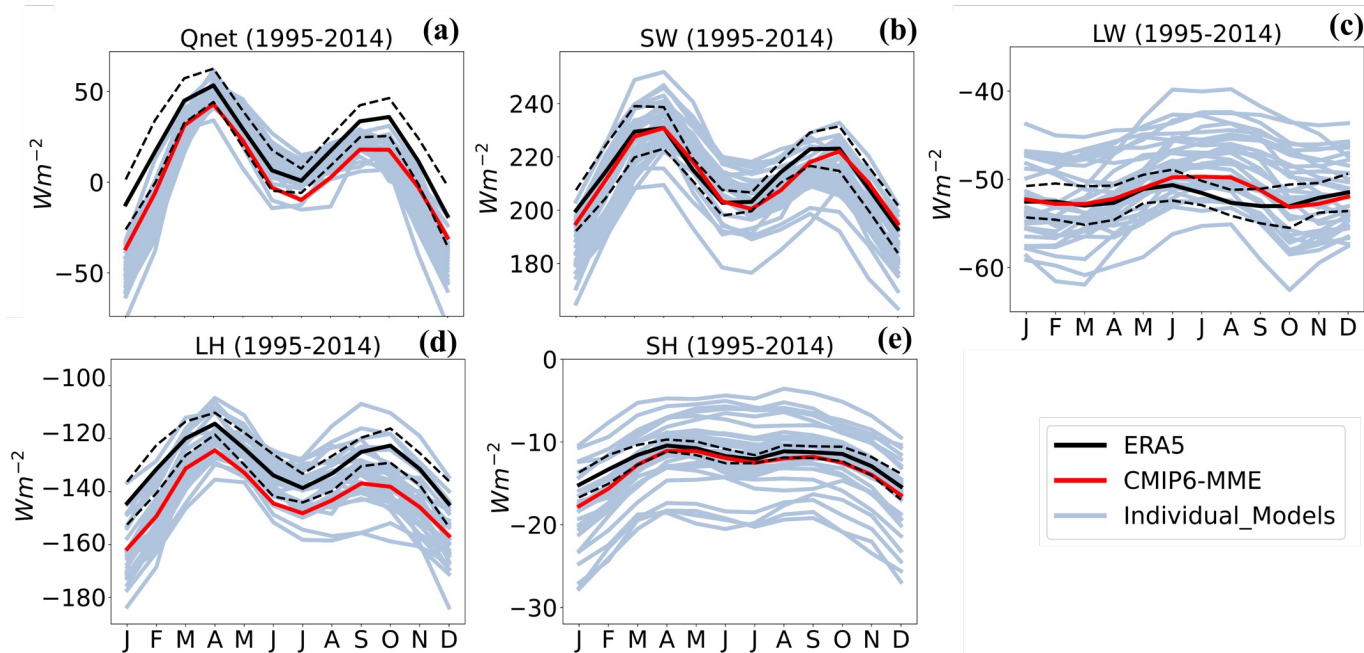
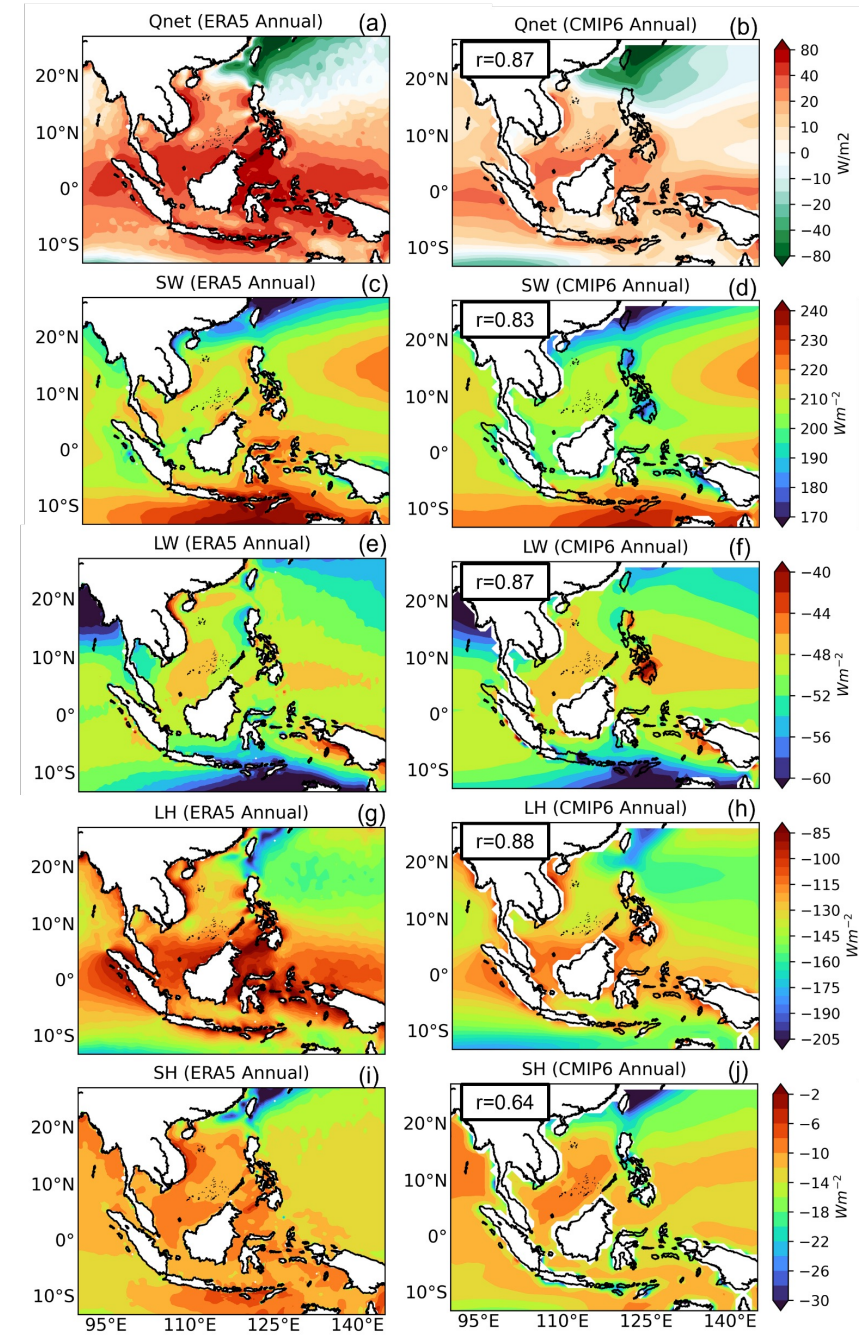
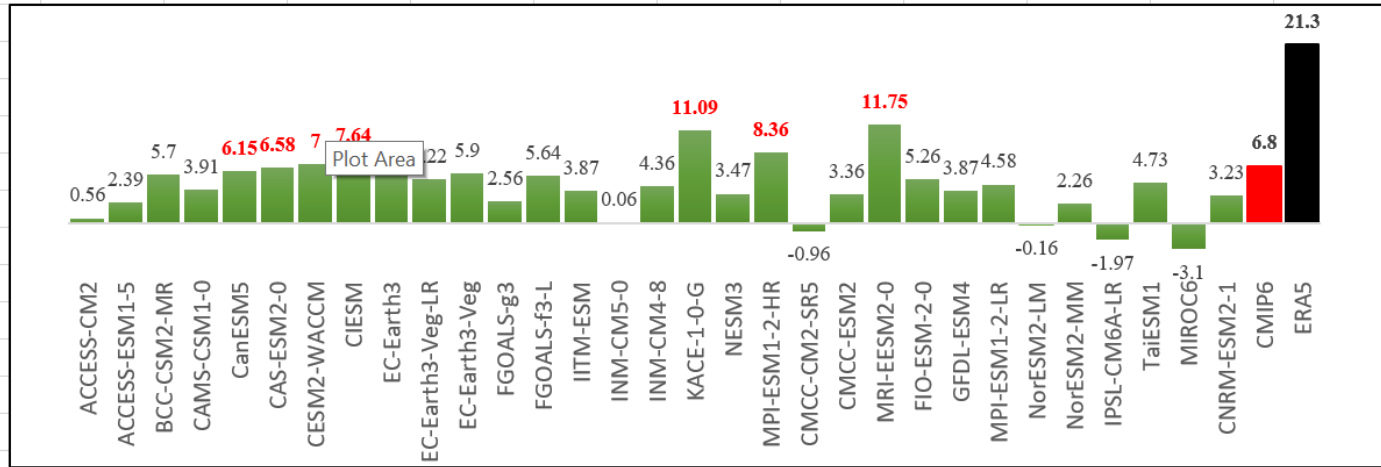
Quantifying air-sea heat fluxes over Southeast Asia and their response to climate change

Presented by Hue Thi Thanh Nguyen

Supervisors: Dr. Marine Herrmann (LEGOS), Dr. Thanh Ngo-Duc (USTH)

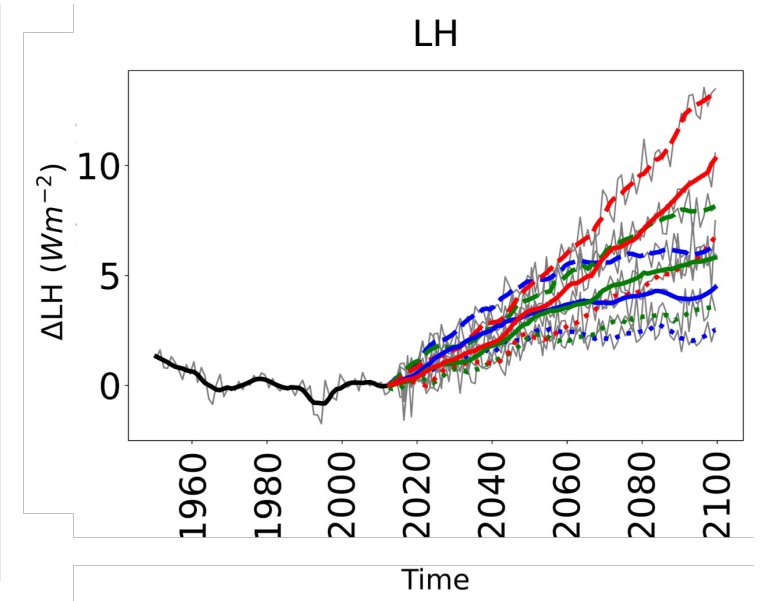
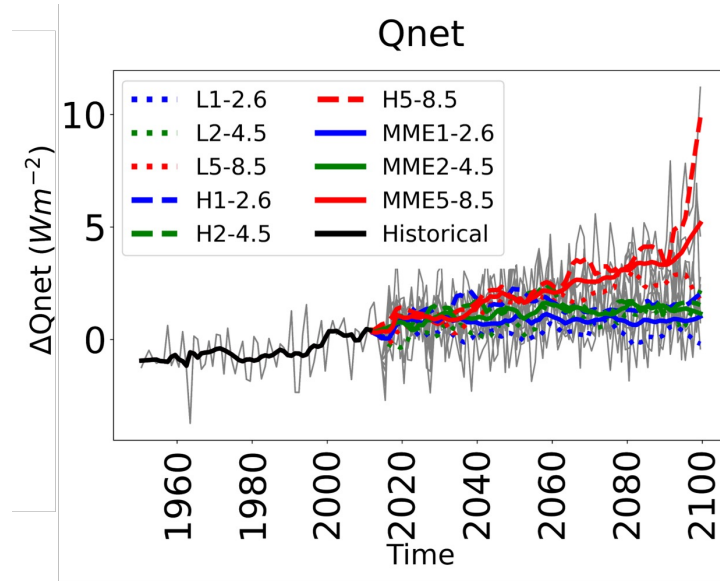
CMIP6 heat fluxes analysis

The annual mean of heat flux of 30 models from CMIP6, ensemble of multimodels, ERA5 (1995-2014)

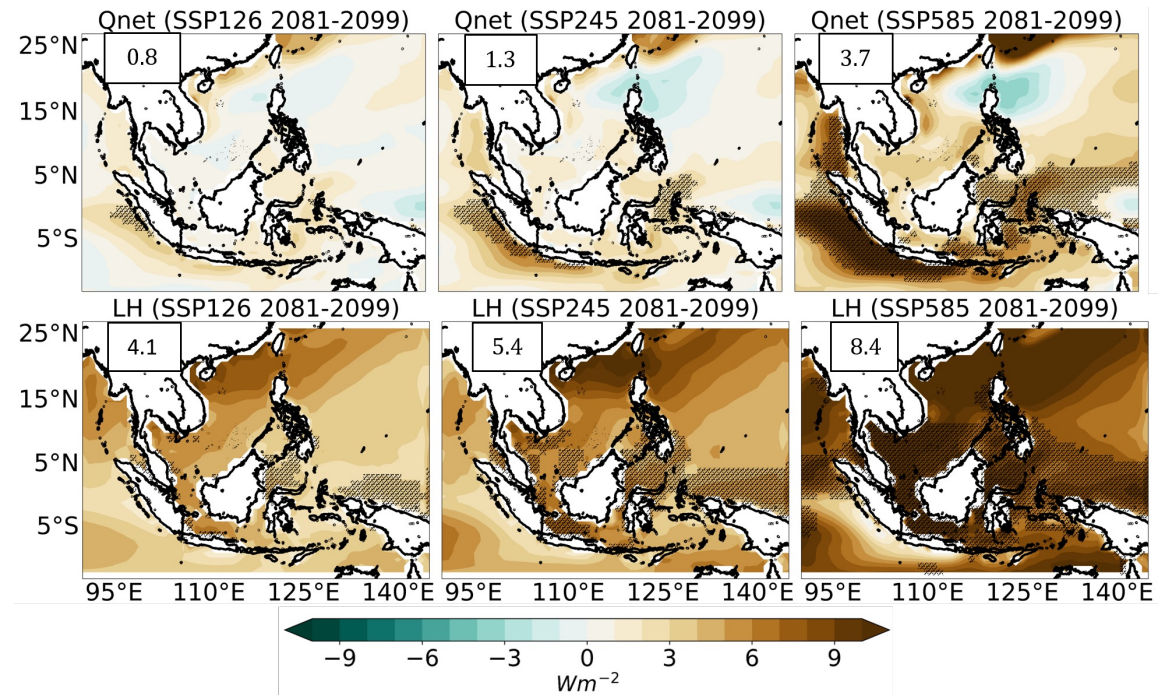


Future projection

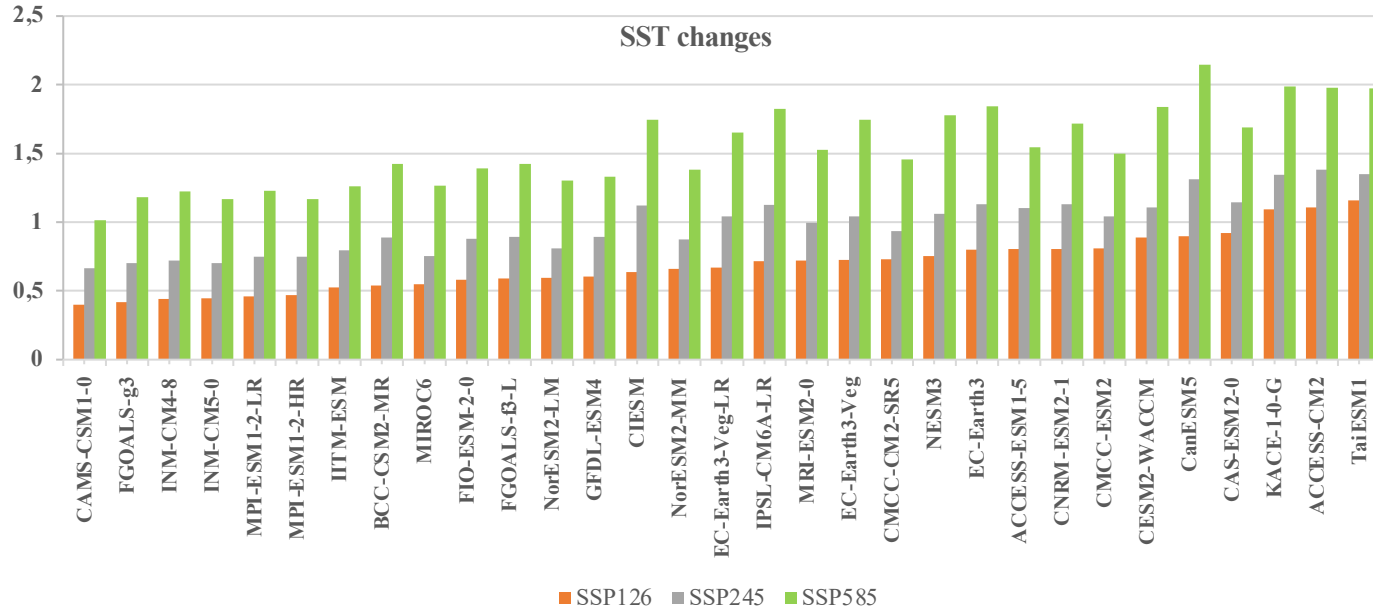
- Historical: **1950-2014**
- Baseline period: **1995-2014**
- Future: 2081-2099 (**SSP126, SSP245, SSP585**)



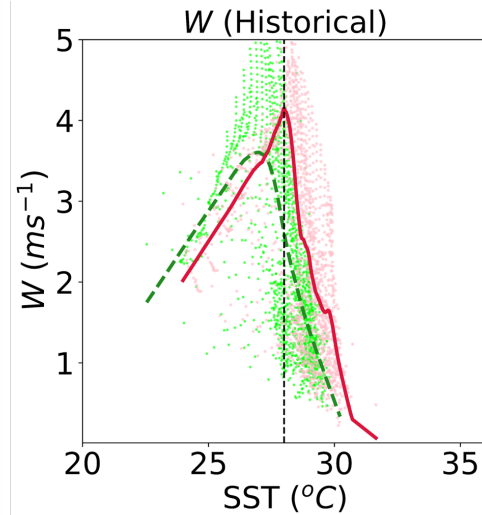
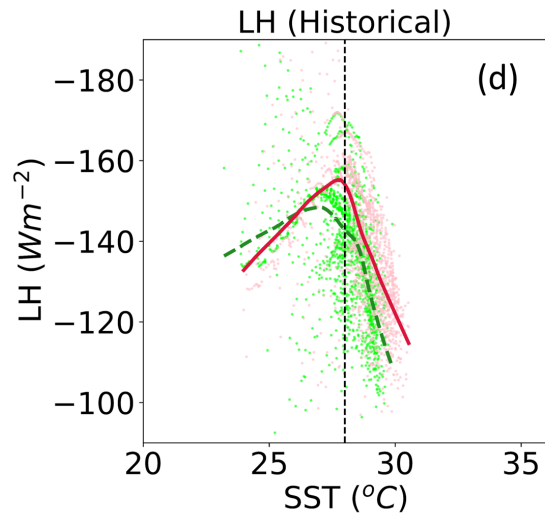
Period	Scenarios	SW	LW	LHF	SHF	Qnet
2041-2060	SSP126	2.0	-1.9	3.2	-0.3	1.0
	SSP245	0.7	-2.8	2.9	-0.6	1.2
	SSP585	0.2	-4.0	3.2	-0.9	1.9
2081-2099	SSP126	2.9	-1.8	4.1	-0.3	0.8
	SSP245	1.4	-4.4	5.4	-0.9	1.3
	SSP585	1.0	-9.2	8.4	-1.8	3.7



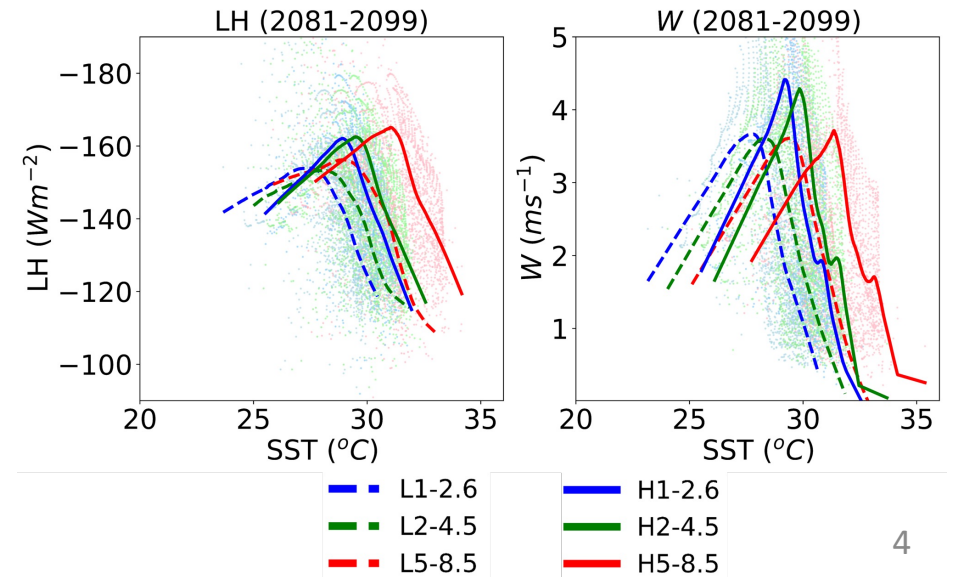
Future projection



Group/Scenarios	SSP126	SSP245	SSP585
Lowest group (L)	L1-2.6	L2-4.5	L5-8.5
Highest group(H)	H1-2.6	H2-4.5	H5-8.5



- - L-Hist — H-Hist



Conclusion

1995-2014

- ✓ The SEA is the **heat gain region**
- ✓ Heat gain over 10°S–20°N
- ✓ Qnet, SW: maximum in April and October
- ✓ LW: opposite of Qnet seasonal cycle
- ✓ Qnet: CMIP6 **lower** than ERA5 (may due to SW and LH)
 - At low SST: LH loss, and *W* increase
 - At high SST: LH loss decrease
 - Decrease in wind speed: responsible for the low LH

Projections for future:

- ✓ Heat gain: strongerst (SSP585) in East of Indian Ocean
- ✓ **LH**: heat loss **increase**
- ✓ **LW**: a significant heat loss **decrease**
- ✓ The tipping SST thresholds range from 28 °C to 31.5 °C