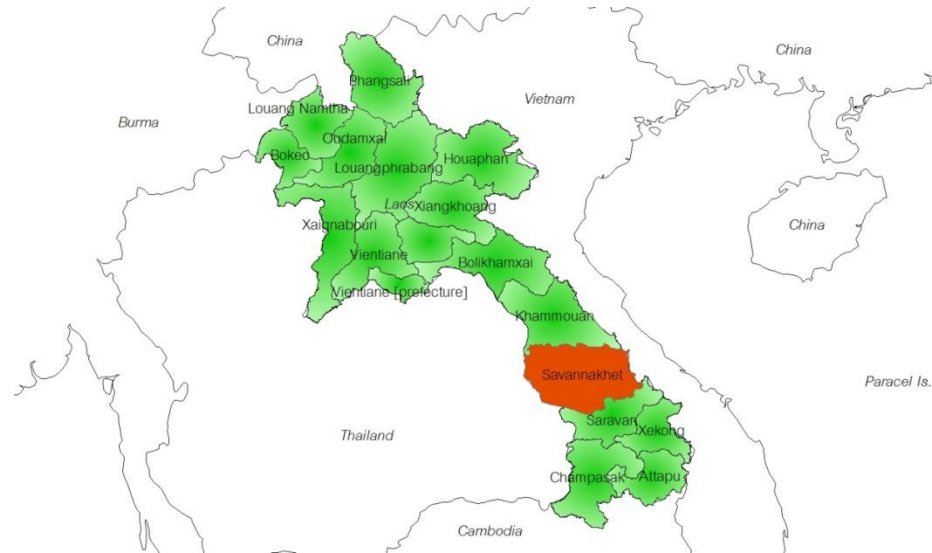


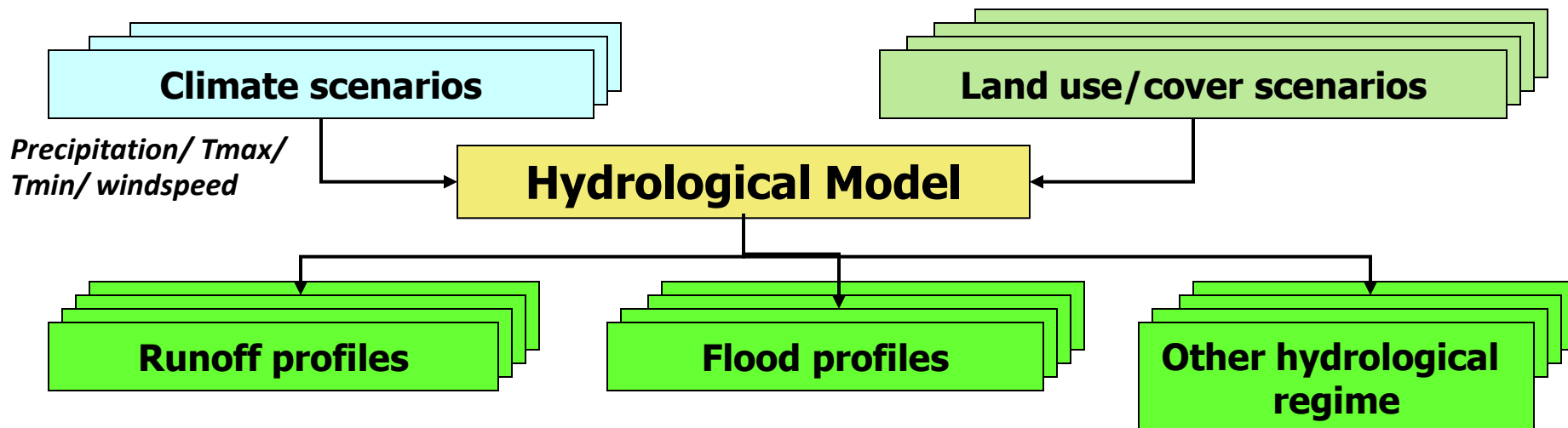
Rapid Assessment on Climate Change Risk CCAI pilot site: Champhone, Savannakhet, Lao PDR



Session 9: Climate change and impact on hydrological regime

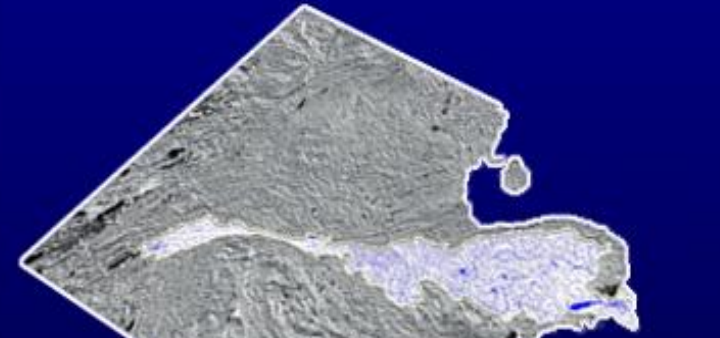
Climate change and impact on hydrological regime

Using long term climate projection data in climate change impact assessment:
Case studies on hydrological analysis



Templates

River Network



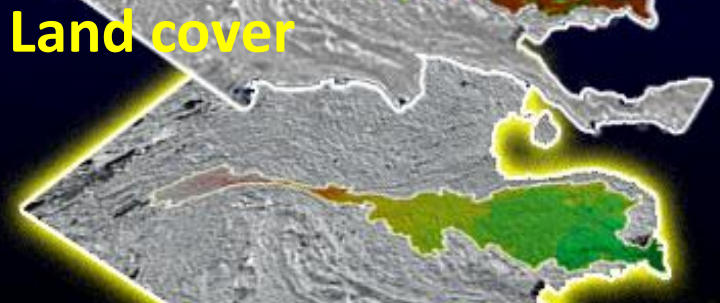
Soil property



Land cover



Elevation



3000

meters

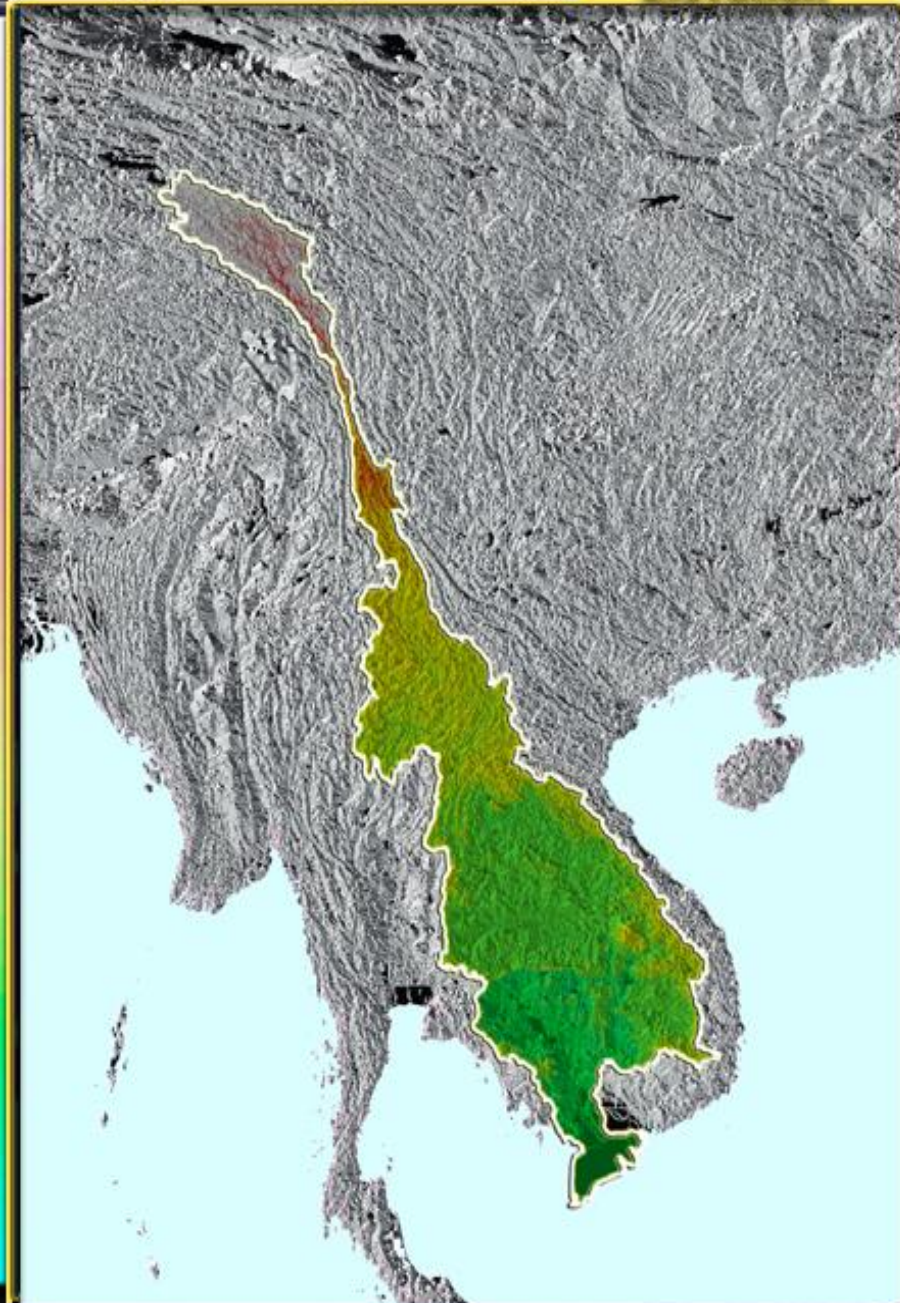
0

Land cover

Soils

Rivers

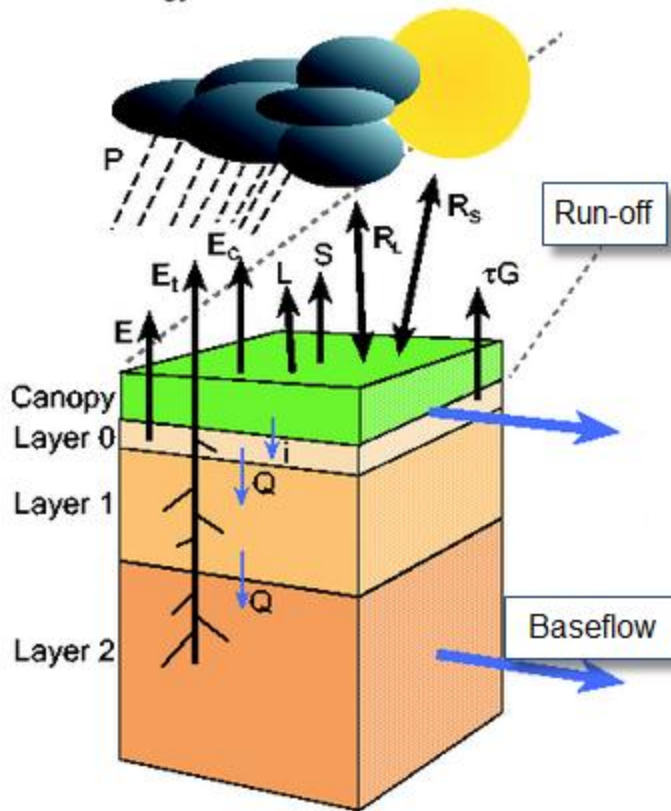
Elevation



Climate change and impact on hydrological regime

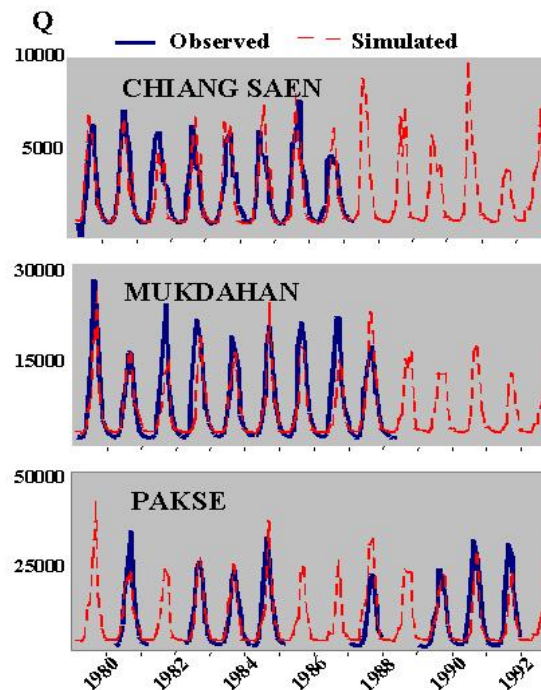
Precipitation, Tmax, Tmin, Wind speed

Cell Energy and Moisture Fluxes



Routing Model

Discharge (mm³/s)



Variable Infiltration Capacity model (VIC)

Climate change and impact on hydrological regime

Daily
Discharge

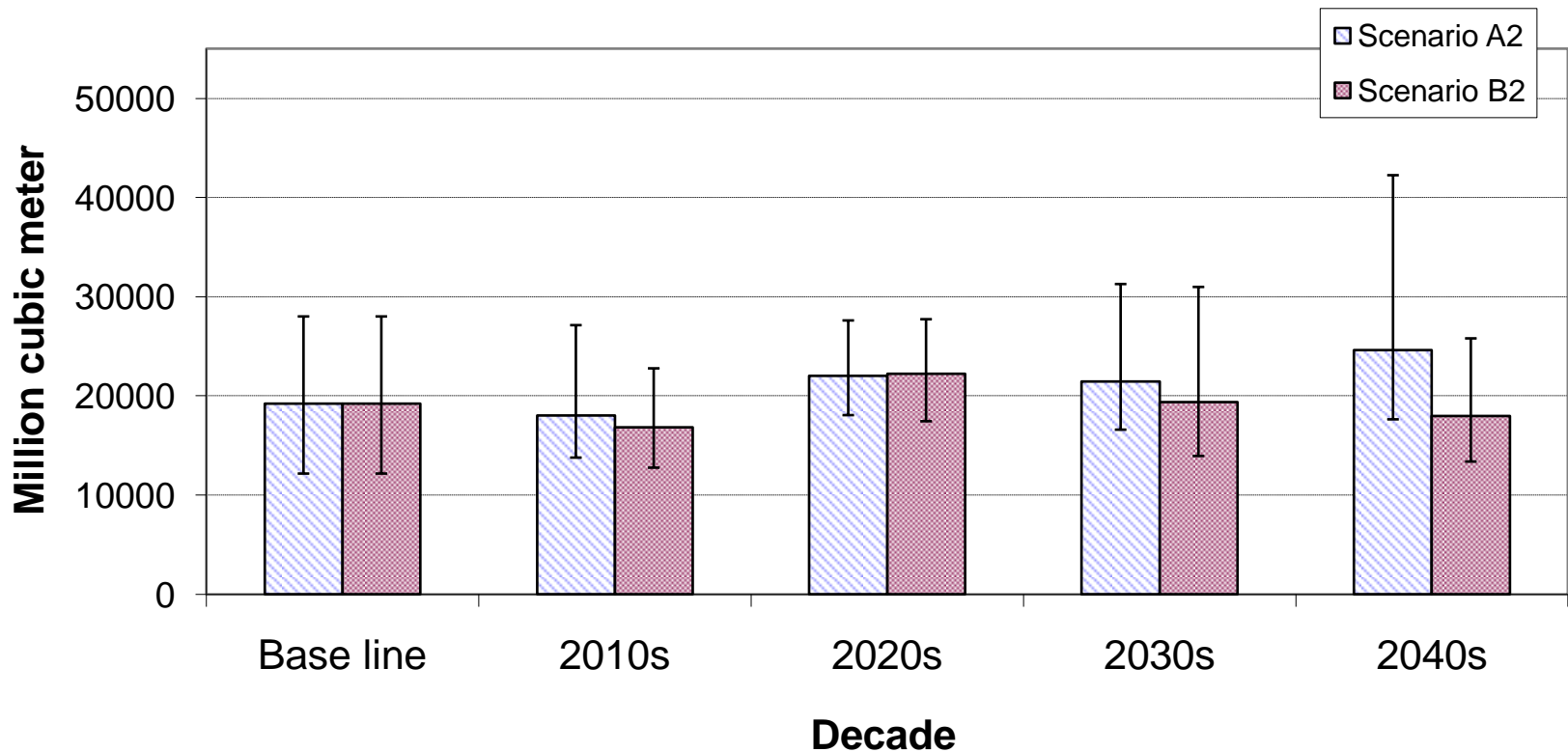
Day	Base	2010s	2020s	2030s	2040s
1	1509	1739	1300	1736	1296
2	1491	1684	1293	2013	1290
3	1479	1636	1284	1283	1284
4	1476	1593	1275	1723	1279
5	1478	1556	1266	2381	1275
6	1481	1523	1258	3226	1270
7	1480	1493	1249	3879	1263
8	1478	1466	1241	4026	1255
9	1483	1442	1234	3757	1247



Day	Base	2010s	2020s	2030s	2040s
3642	1479	1439	1588	1366	1262
3643	1586	1417	1551	1357	1258
3644	1680	1396	1522	1349	1257
3645	1718	1377	1506	1340	1264
3646	1717	1360	1502	1332	1277
3647	1698	1344	1505	1323	1296
3648	1670	1330	1510	1315	1317
3649	1637	1318	1525	1308	1339
3650	1600	1308	1580	1301	1370

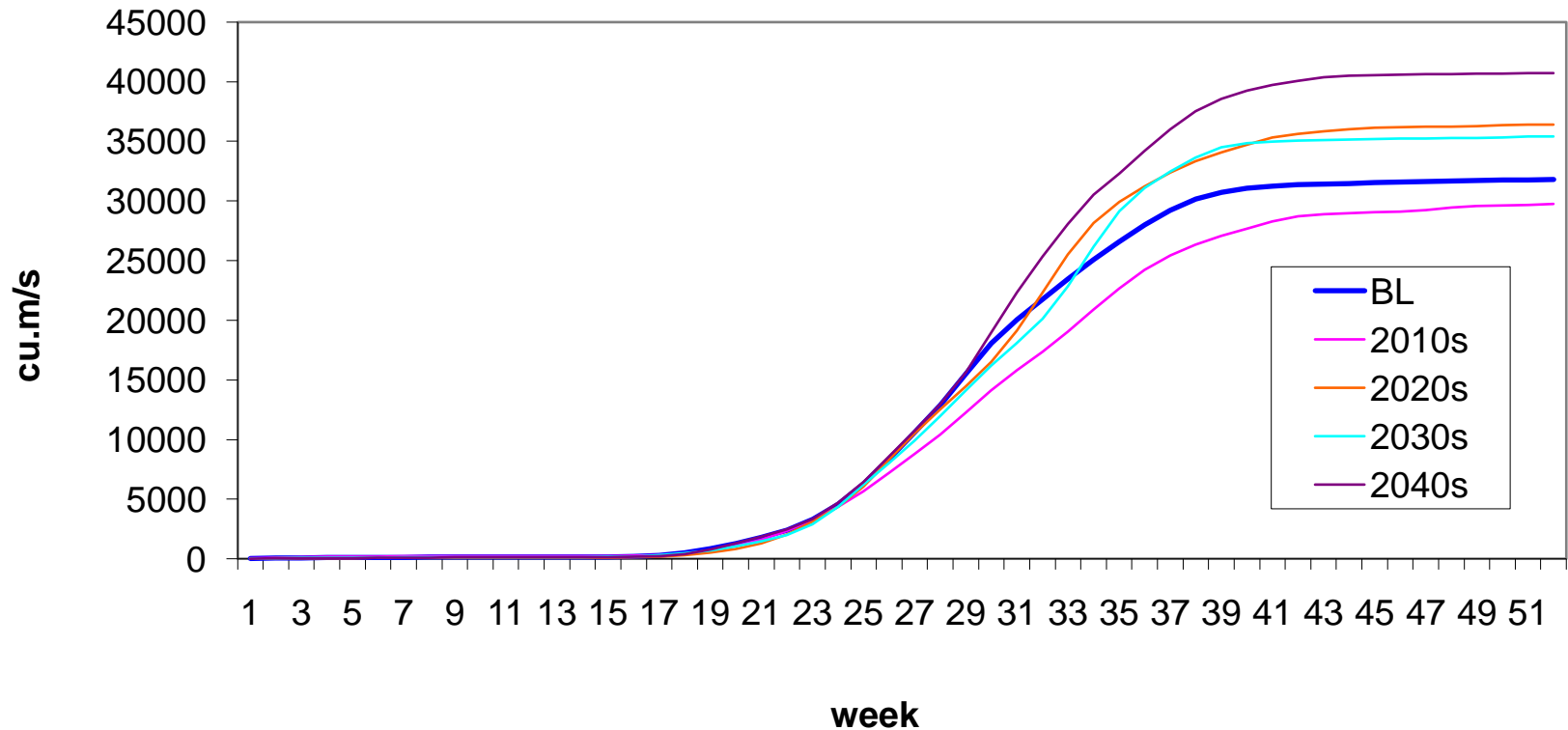
Climate change and impact on hydrological regime

Change in annual discharge – Se Bang Hieng



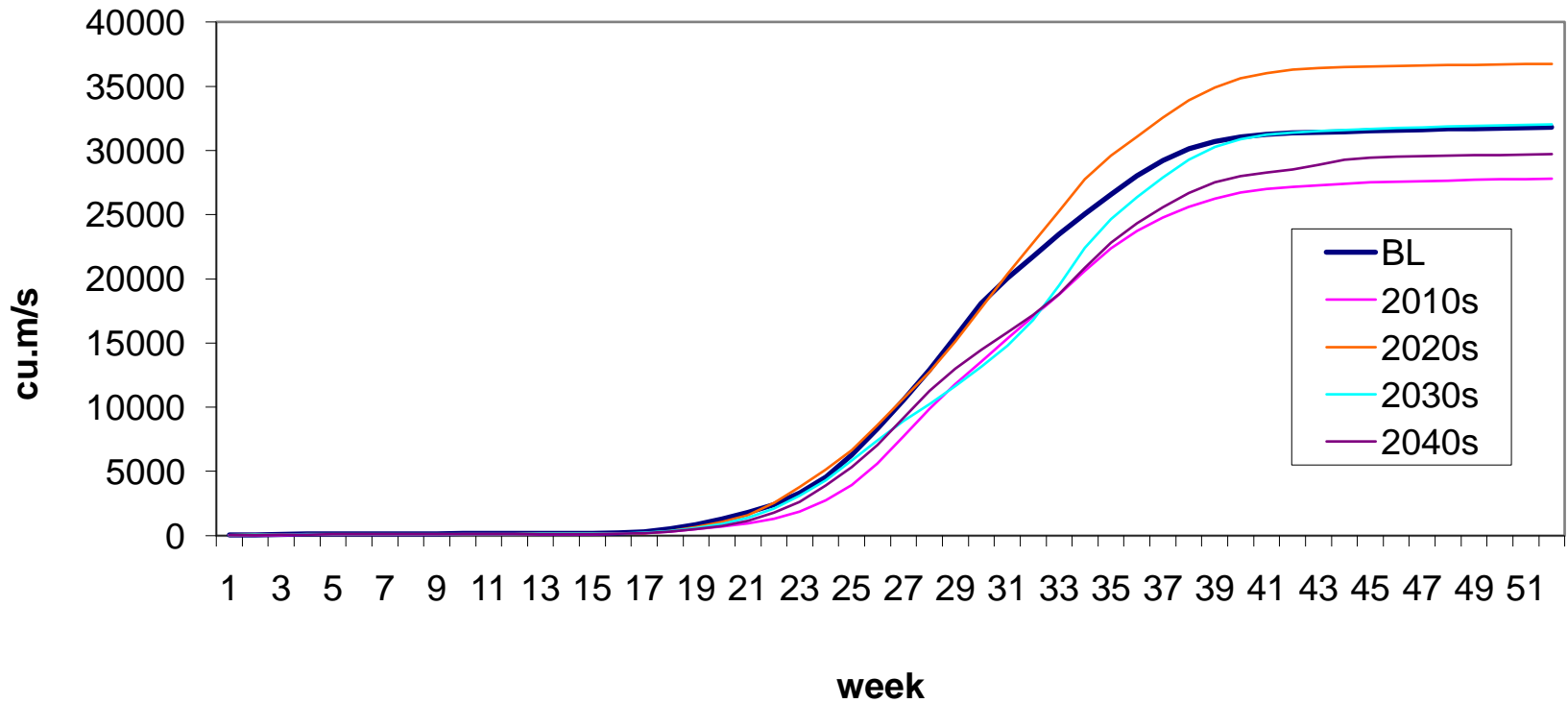
Change in weekly discharge – Se Bang Hieng

Scenario A2

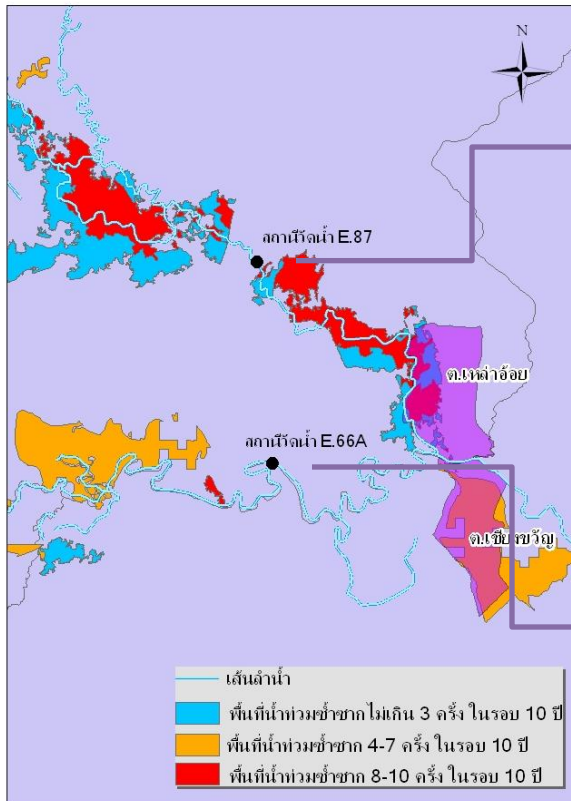


Change in weekly discharge – Se Bang Hieng

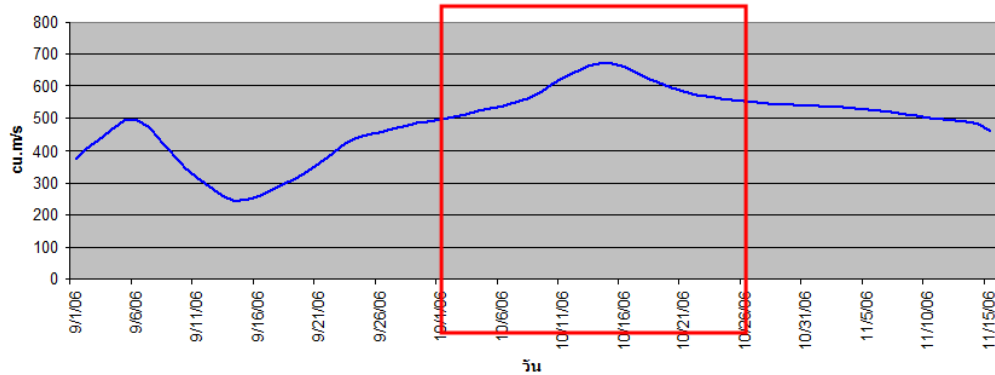
Scenario B2



Critical flow – flood risk (based on historical data)

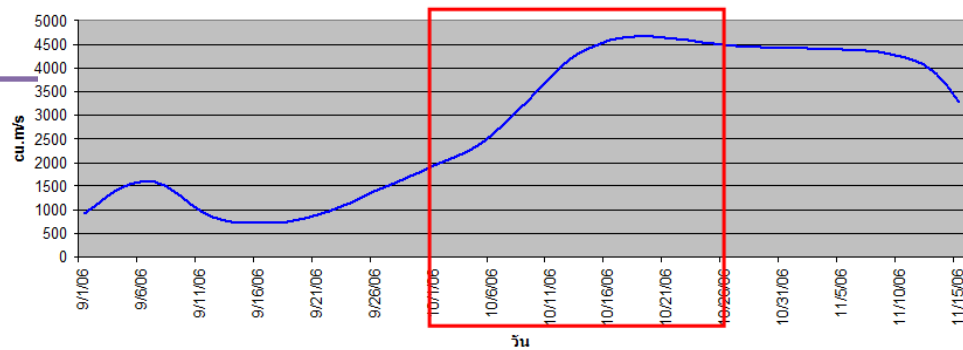


ปริมาณน้ำรวมรายสัปดาห์ ที่สถานี E.87 ระหว่าง 1/9/2549 - 15/11/2549



ปริมาณน้ำรวมรายสัปดาห์ในช่วงที่เกิดอุทกภัย ที่สถานี E.87

ปริมาณน้ำรวมรายสัปดาห์ ที่สถานี E.66 ระหว่าง 1/9/2549 - 15/11/2549

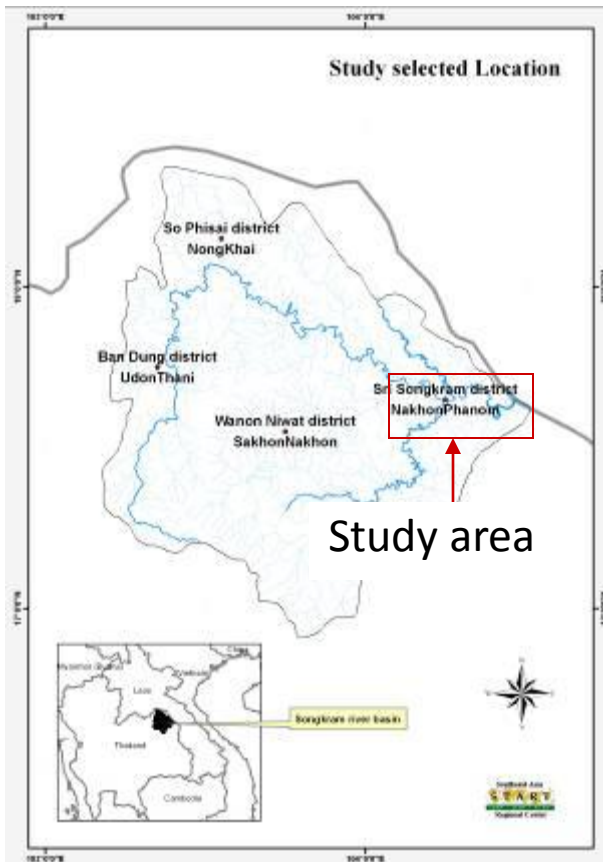


ปริมาณน้ำรวมรายสัปดาห์ในช่วงที่เกิดอุทกภัย ที่สถานี E.66

Climate change and impact on hydrological regime

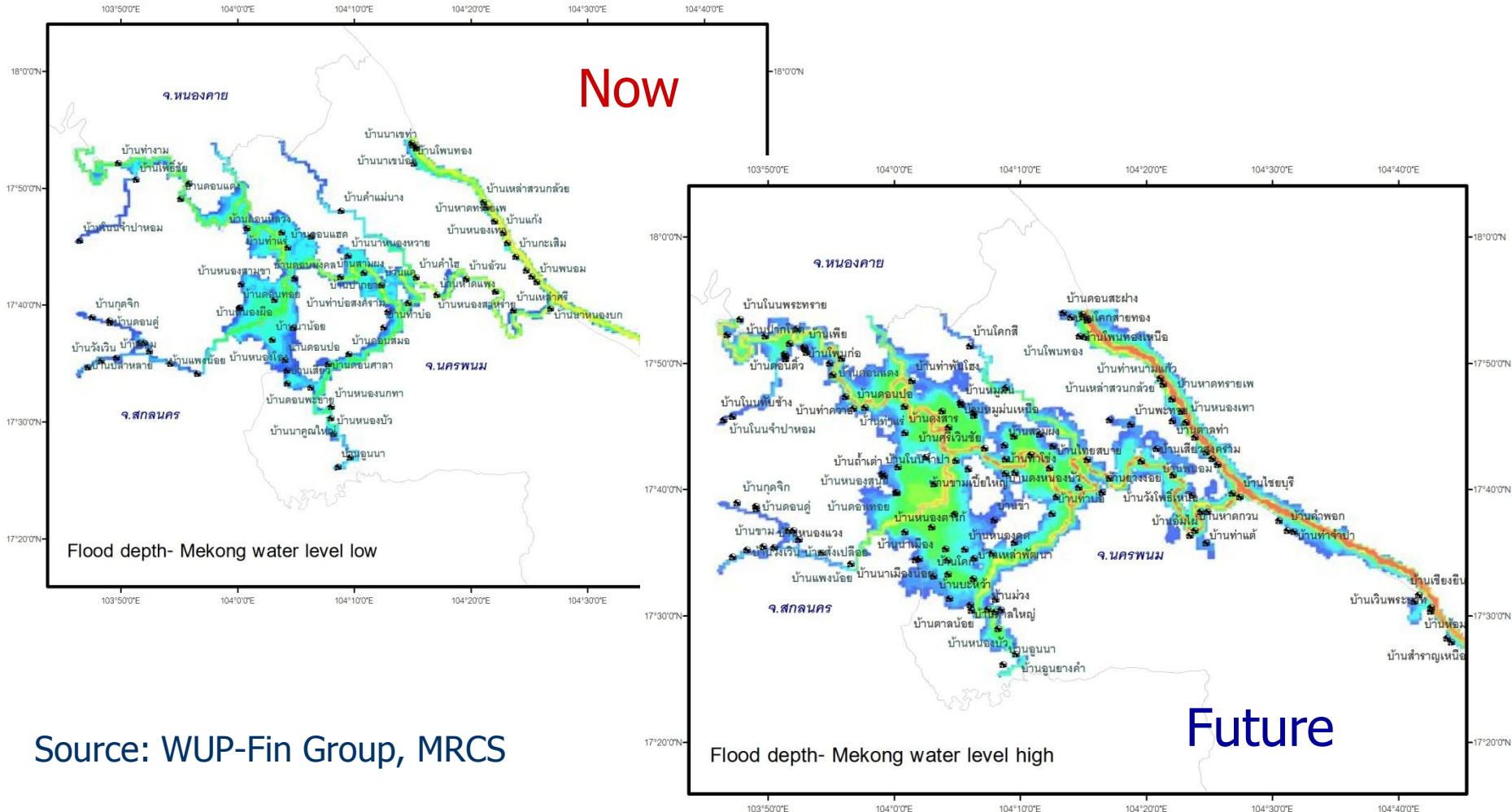
Other examples

Case study in Lower Songkram River basin - Thailand



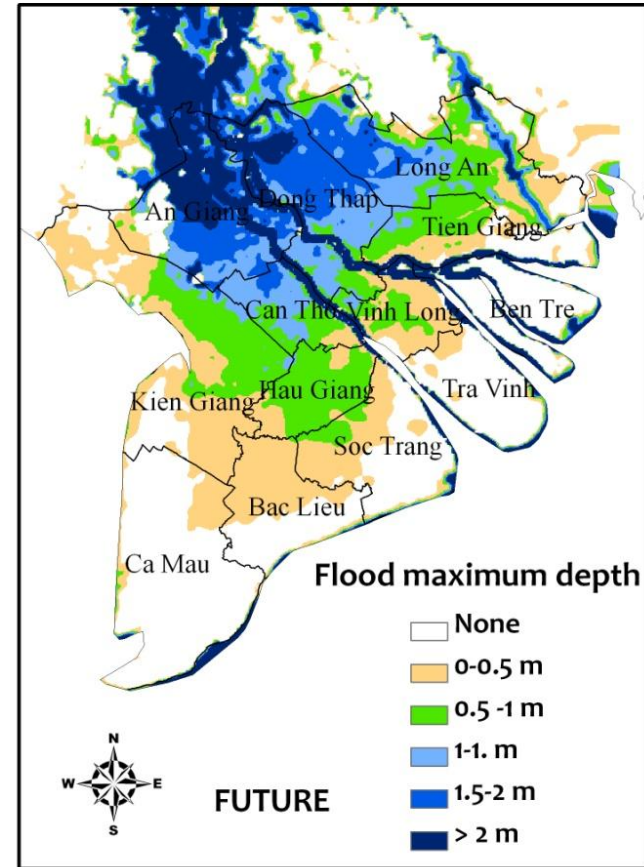
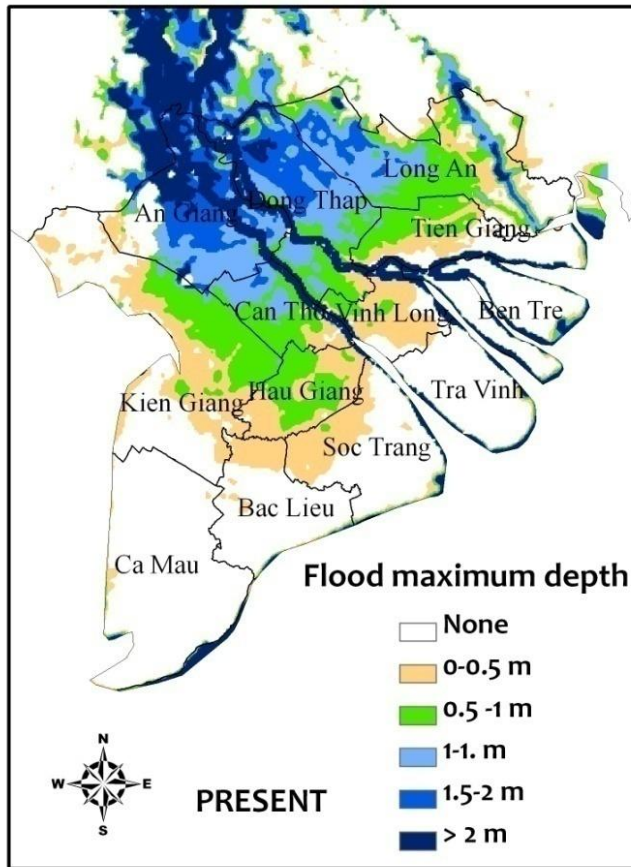
Climate change and impact on hydrological regime

Change in flood boundary in lower Songkram River basin



Source: WUP-Fin Group, MRCS

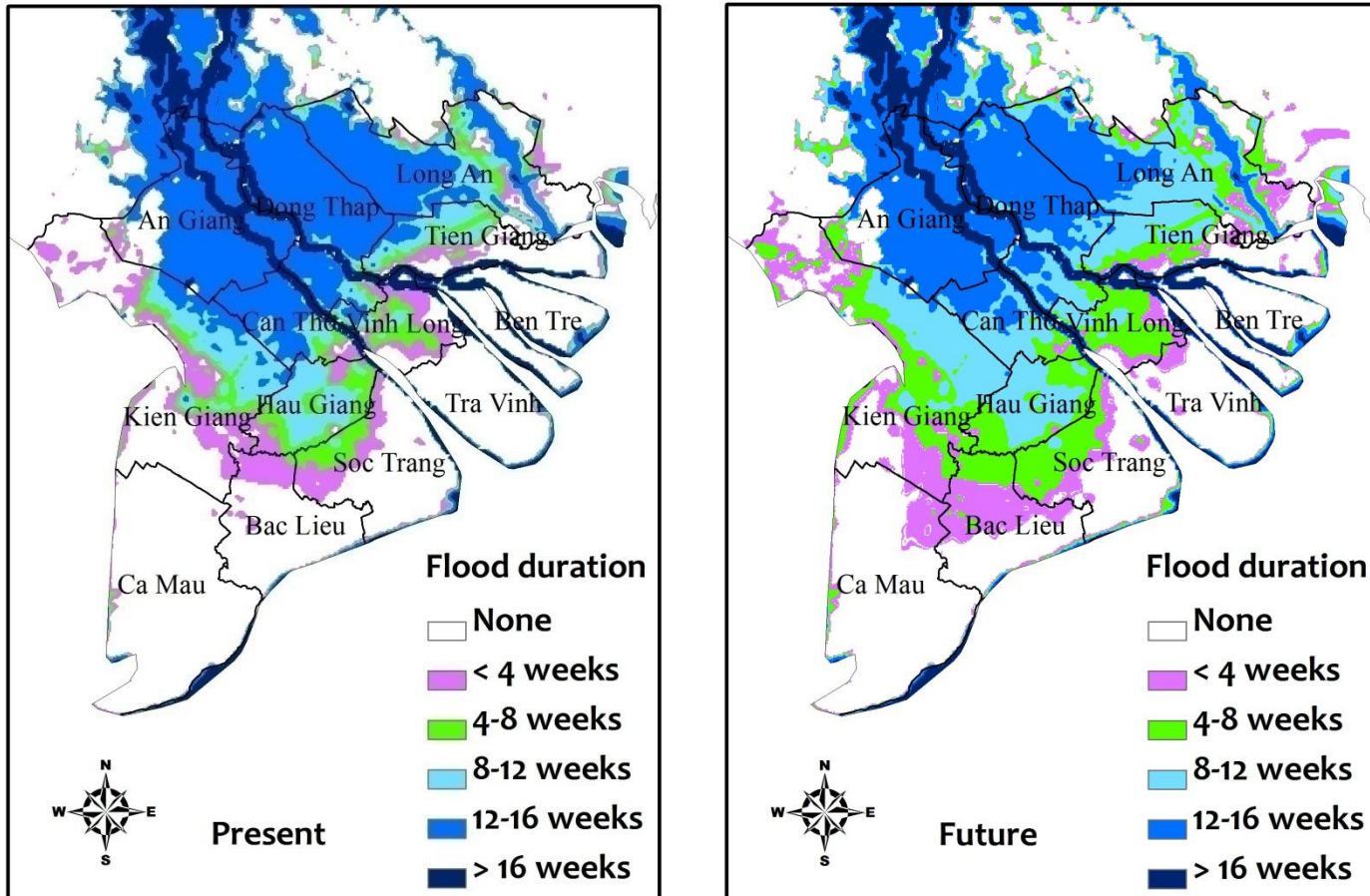
Change in future flood risk in Mekong River delta



Flood boundary may expand in the future.

Climate change and impact on hydrological regime

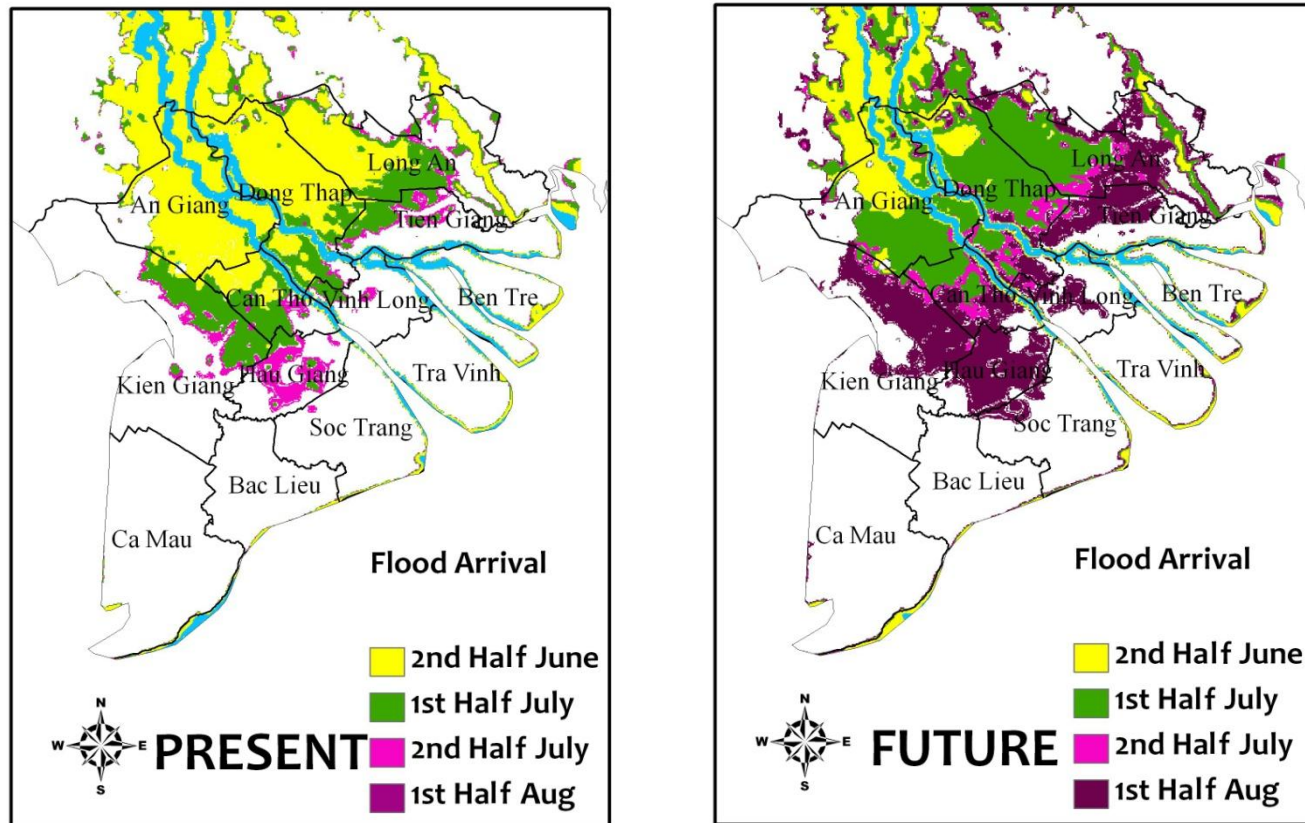
Change in future flood risk in Mekong River delta



But duration of flood may be shorter in the future.

Climate change and impact on hydrological regime

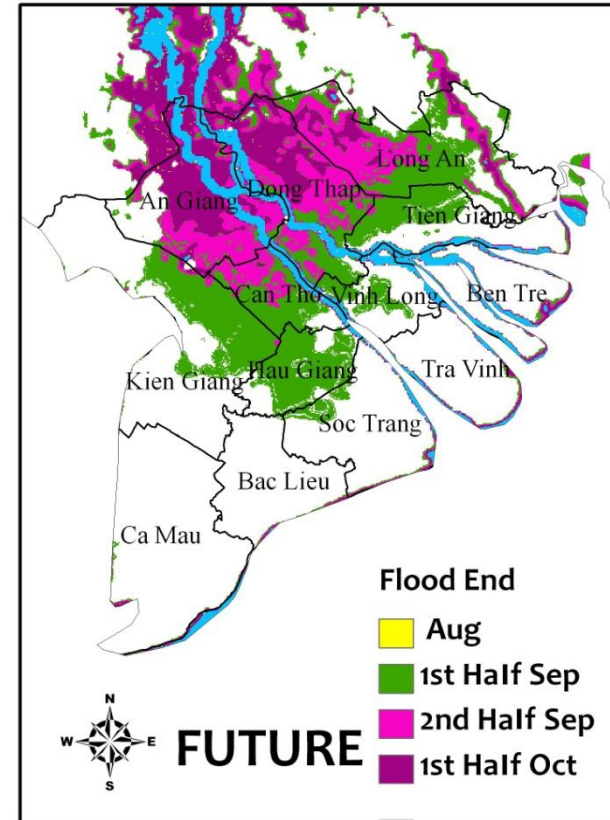
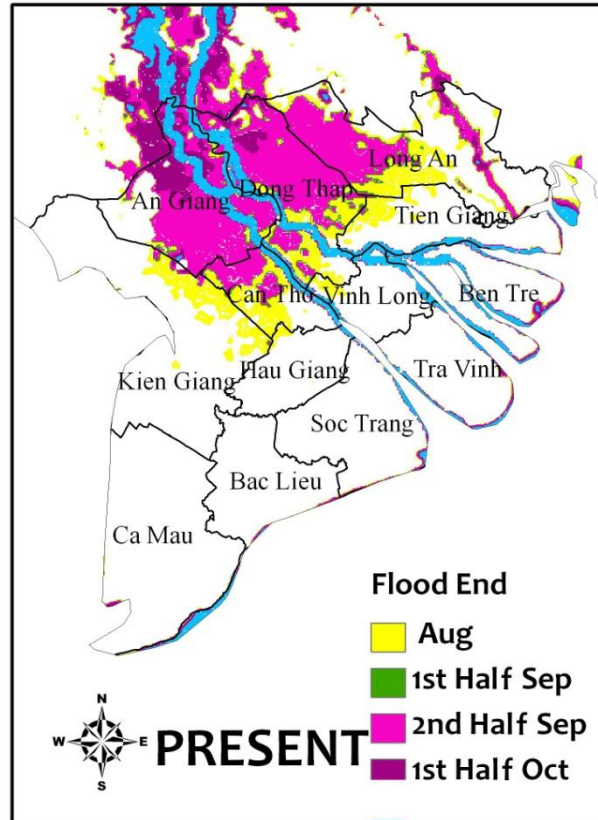
Change in future flood risk in Mekong River delta



Serious flood – 50cm (river overflow) may arrive 2 weeks late in future.

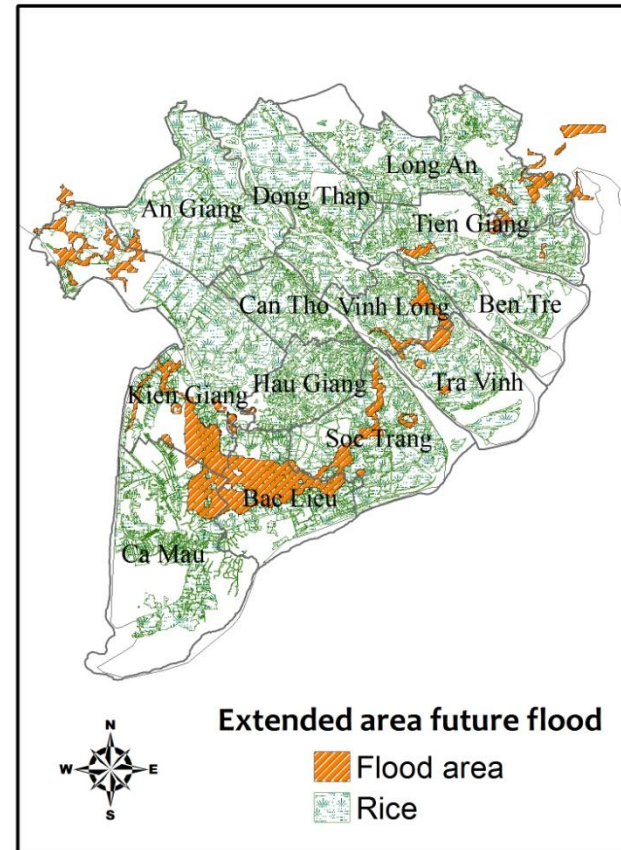
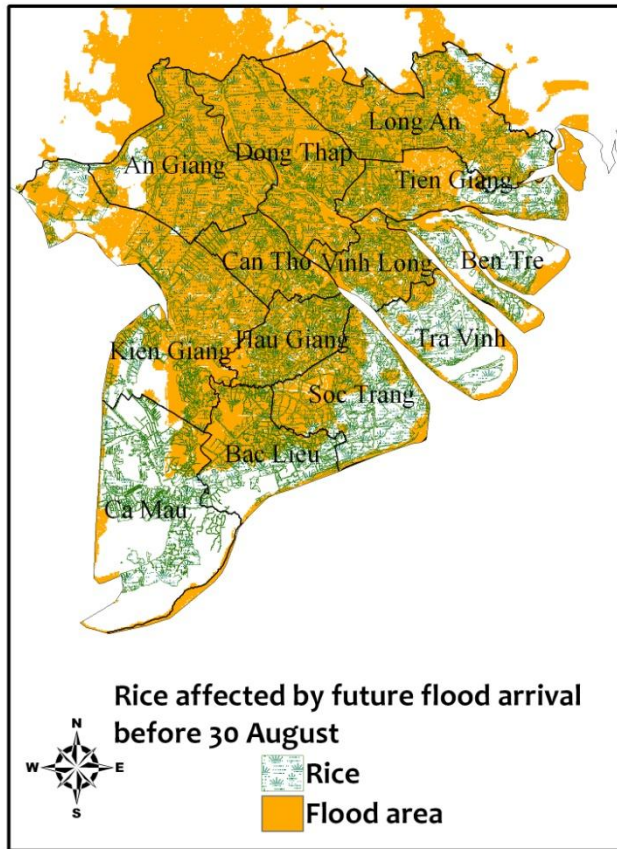
Climate change and impact on hydrological regime

Change in future flood risk in Mekong River delta



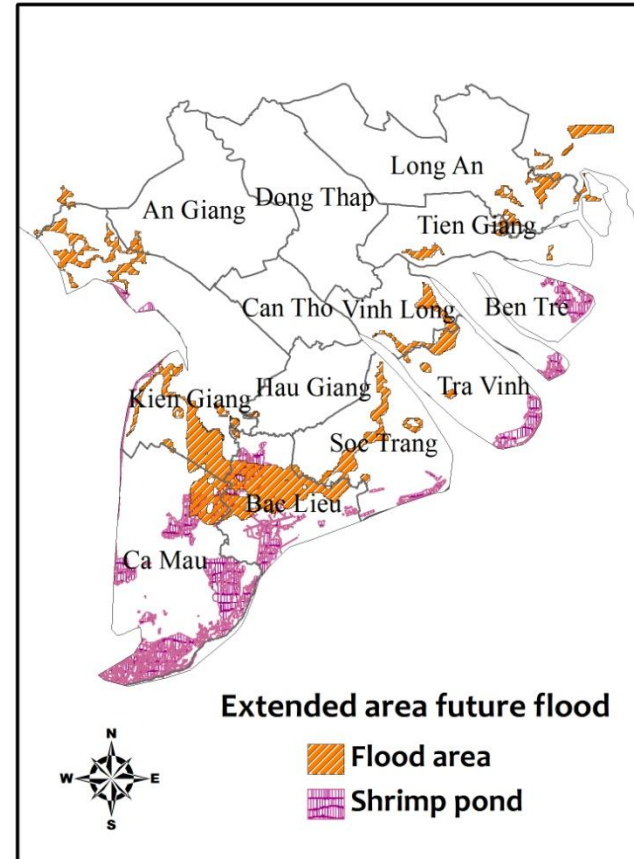
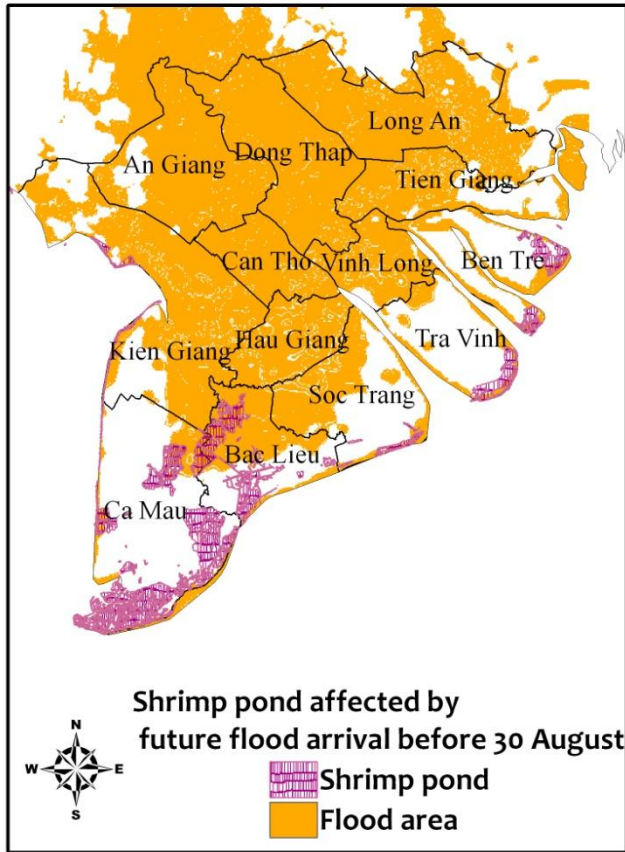
Serious flood (50cm) may end 2 weeks late in future

Change in future flood risk in Mekong River delta



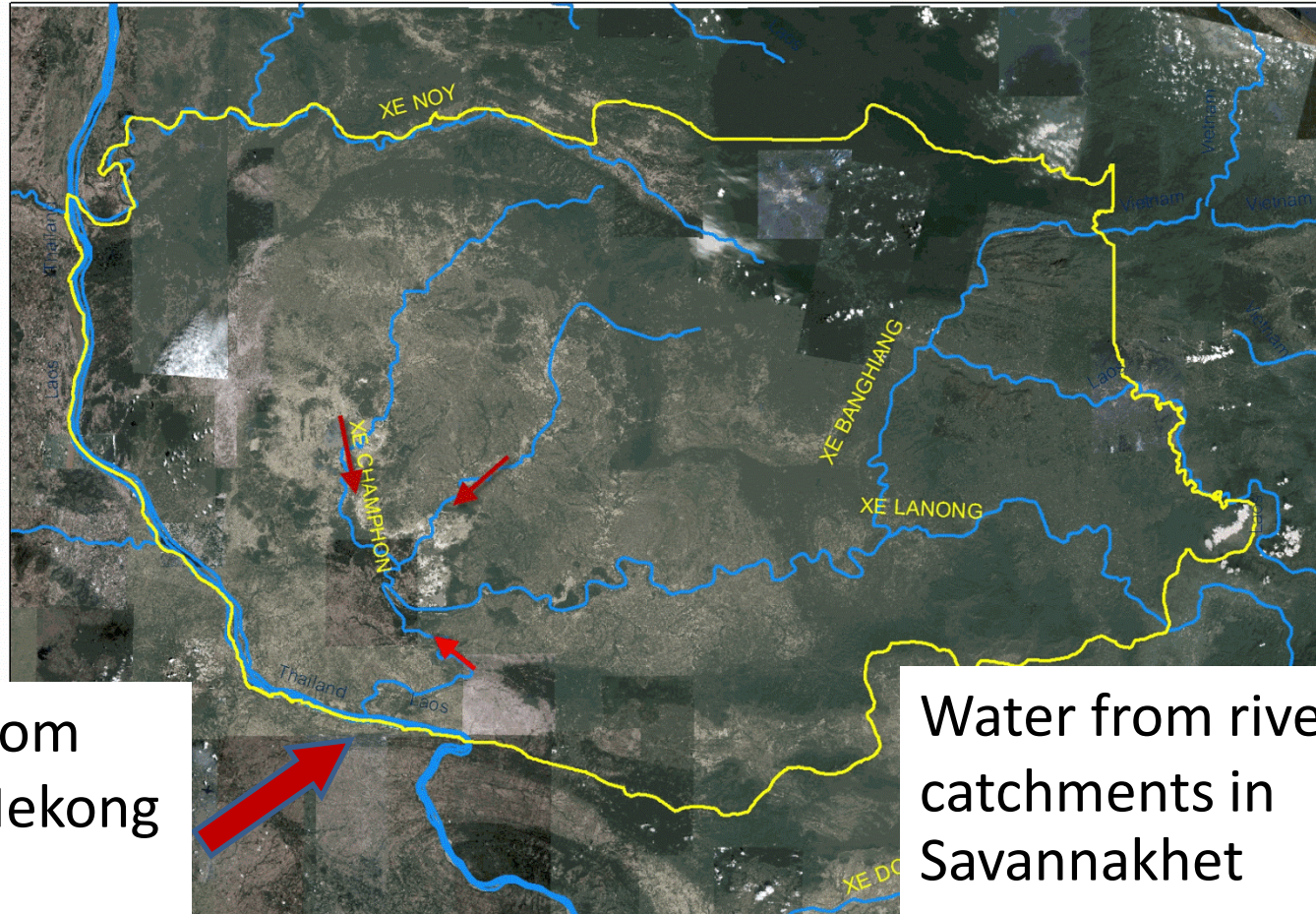
Serious flood (50cm) may start before end-August and affect the Summer-Autumn rice crop

Change in future flood risk in Mekong River delta



Extended inundated area and affect some shrimp ponds.

Flood risk at Champhone, Savannakhet



Water from
upper Mekong
river

Water from river
catchments in
Savannakhet

Thank you

