Response to referee comment Anonymous Referee #1

We appreciate and would like to thank Anonymous Referee #1 for taking his/her time and effort to read our manuscript and the generally positive impression of our work. We will use the constructive comments to improve our manuscript. Here we would like to briefly respond to the more significant issues raised in the hope of some further discussion (original comments in black, our response in blue).

1- I think the title should be rephrased mainly because the manuscript present results from hydrological models (estimations of evaporation) instead of direct measurements. Thus, I believe it could be more realistic the title Estimation of evaporation . . ....

We agree that clarifying in the title that we refer to simulations/estimations instead of using direct measurements, will clarify the topic of our paper. We would like to suggest to change it to Evaporation from a large lowland reservoir (dis)agreement between evaporation models at various timescales.

2- Page 7, line 12 we chose to give preference to a long-term dataset . . . rather than shorter-term dataset . . . more close proximity to lake IJsselmeer. I understand this point but can you explain more about the shorter dataset? Where is it? When started and finished? Which are the variables? Have you done a data comparison between this site and De Bilt?

We agree on this point that this information is lacking and we will add a few sentences on this. For now to explain in detail, we can describe the following about it: There are two other locations in the vicinity of lake IJsselmeer where meteorological variables are measured by the royal national meteorological institute (KNMI), namely in Stavoren and Lelystad (Fig. 1). At both these locations the measurements started in 1990. In Stavoren the measurements started mid 1990 measuring only wind speed and direction and air temperature at 1.5 m. Relative humidity was added to the observations end of 1990 and measurements of global radiation only started mid 1993. Other variables that are needed in the analysis started end 2002 (i.e. cloud cover) or are not measured at all (i.e. air pressure). In Lelystad the measurements have started in the year 1990 as well, but measurements of air pressure are starting only mid 1992, and of cloud cover end of year 2002.

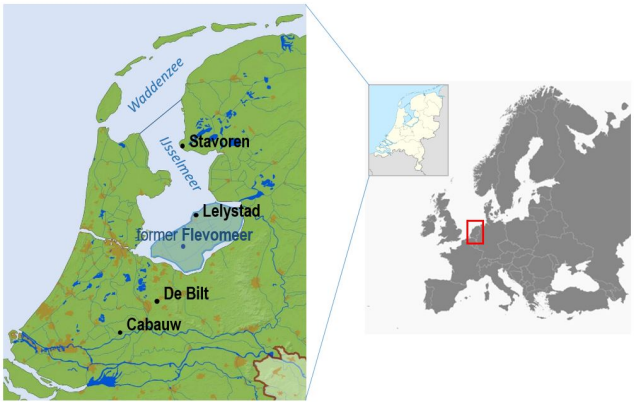

Figure 1: Overview of the area of interest and the locations of the observational stations.

Except for the wind speed, which is lower in De Bilt than in Lelystad and Stavoren, the variables are comparable between Stavoren and De Bilt, and Lelystad and De Bilt (Table 1). In terms of the behaviour of the wind speed, e.g. its daily cycle and frequency distribution, there is no substantial difference between the locations. In terms of quantity, the lower wind speed in De Bilt will have the largest effect on the wind-driven Granger-Hedstrom evaporation method. However, we think it will not change our conclusions, since we are merely comparing the evaporation methods in a, close to

synthetical, experiment, which we then translate to the IJsselmeer region.

Table 1: Comparison of meteorological variables between locations De Bilt, Lelystad and Stavoren.

	De Bilt		Lelystad		Stavoren	
	mean	sd	mean	sd	mean	sd
T_{air} [°C]	10.4	6.8	10.1	6.8	10.2	6.5
u [m s^{-1}]	3.5	1.9	4.4	2.4	5.9	3.0
K_{in} [W m^{-2}]	115.2	189.8	117.1	193.0	123.0	203.0
RH [-]	0.82	0.15	0.84	0.14	0.85	0.11

3- Page 17, line 21 You present Table 2 as a summary for IJsselmeer region. In your opinion what is the extension of your results? Can be extended for the northern region of the lake, for example?

Thank you for raising this point. The lake itself is large, but in terms of the major meteorological variables (e.g. air temperature, air pressure, global radiation, wind speed and relative humidity) and water depth (i.e. ranging from 1.5 to 6 m) it is not varying massively. However, there will probably be differences between the evaporation rate in the middle of the lake, where the air has had a larger probability to get saturated, compared to where there is more interaction between land-lake closer to the coast. In continuation of this study, we will explore the spatial distribution of the evaporation rate over the IJsselmeer region using satellite data.

4- Page 17, line 25 and 30 What is the average annual accumulated precipitation in the region? And the magnitude of other inputs?

Based on observations from De Bilt, the average annual accumulated precipitation is 821 mm, based on the years 1951 – 2018. It ranges from 536 mm in dry years, to 1240 mm in extreme wet years. Another source of input is through the rivers (e.g. the IJssel river), which is equivalent to rising water levels of 7036 mm in the IJsselmeer region on average yearly. This is based on data that originates from simulations performed with the LHM model (Netherlands Hydrological Instrument), which is not openly available. Sources of output, other than evaporation, are the discharge of water from the IJsselmeer to the neighbouring provinces for agricultural activities, and discharge to the Waddenzee for water level regulations. Based on this data the water balance shows that on average the yearly water level in the IJsselmeer region increases with 2 mm, but it ranges from -490 mm to 479 mm in dry or wet years, respectively.

Considering one of the specific comments:
Page 8, line 5 Please add a Figure with WST obtained with Flake simulation.

We could add figure 2 in which the time series of WST obtained with FLake simulation is shown, as well as its daily average cycle. However, we do not see the direct relevance of adding these figures to make our points clear. Would the referee agree with this?

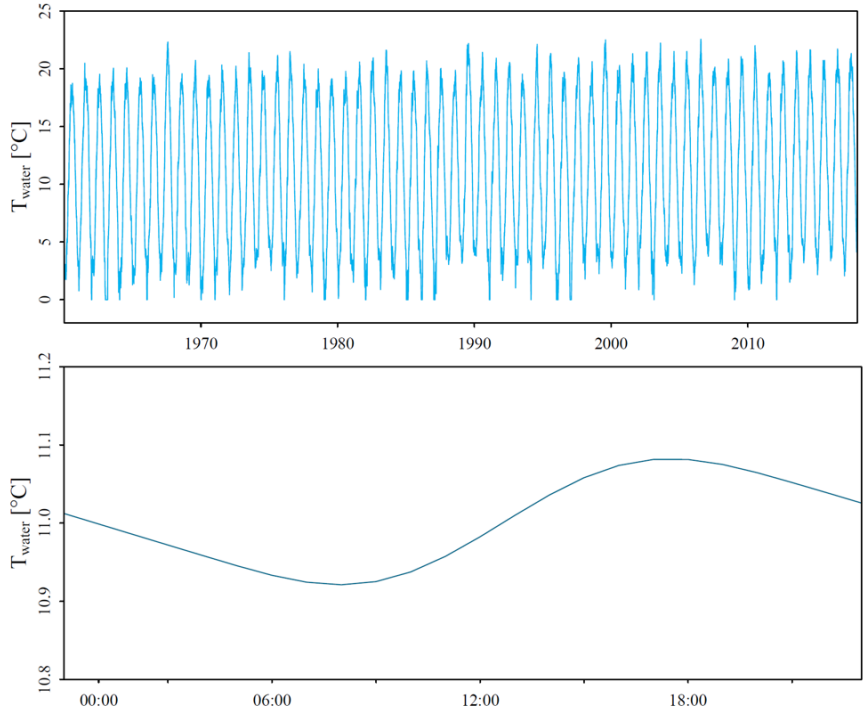

Figure 2: WST simulated using FLake, (top) hourly time series from 1960 – 2018, (bottom) average diurnal cycle.