SUPPLEMENTARY DATA

FIG. S1. Visualisation of the pinning method used to analyse the secondary growth in six *Avicennia marina* trees in Gazi Bay (Kenya). The cambium of the trees was wounded with a hypodermic needle of 0.8 mm diameter on a monthly basis between February 2006 and January 2007 (A), each time at three sides of the stem circumference (B). As an example, the tree selected for the detailed study through thin sections is depicted in this figure. This tree was pinned in east (E), south (S) and northwest (NW) directions. (B) is a CT-image of the tree at the height of the August 2006 pinnings. The eye symbol indicates the direction from which the picture in panel (A) was taken.

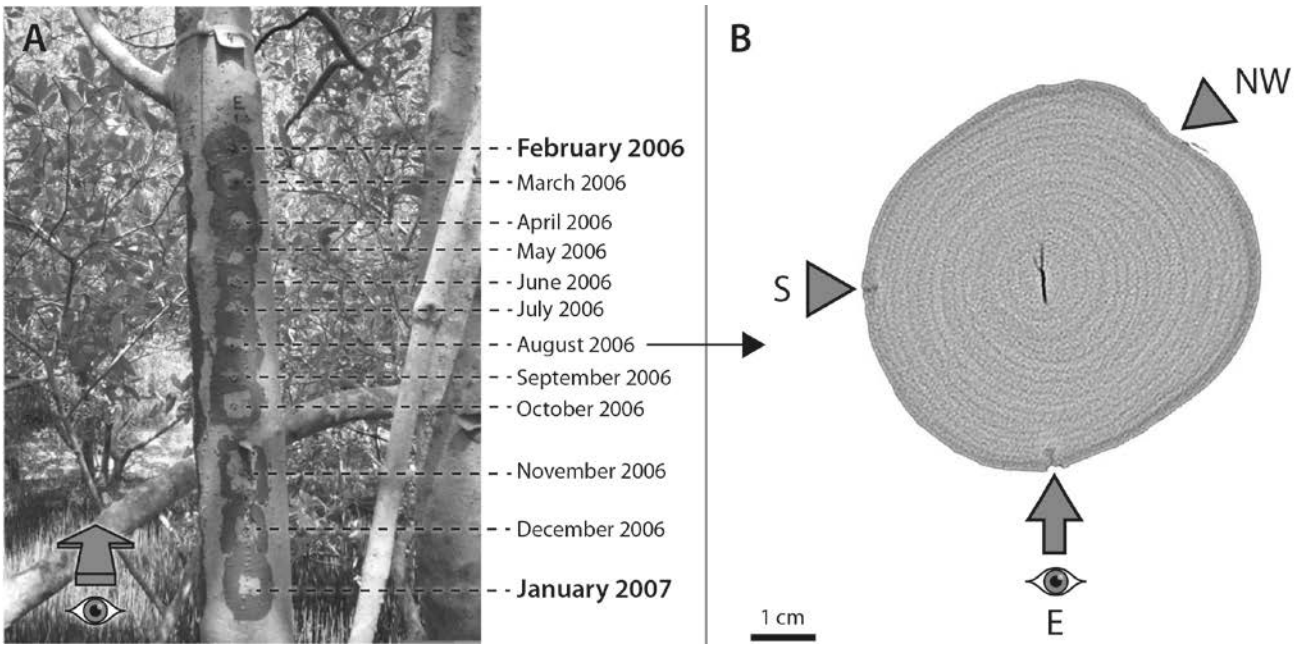


FIG. S2. Thin sections of the pinned parts of the stem showing the increment at the north-western, the southern and the eastern side of the stem at the height pinned in December 2006 (see also Fig. S1). Since the tree was harvested in February 2007, the thin sections show the increment of the tree in the two months after the pinning. The north-western and eastern side of the tree show an average increment of 564 and 569 μm, respectively while no increment could be observed at the southern side. Scale bars are 1 mm.

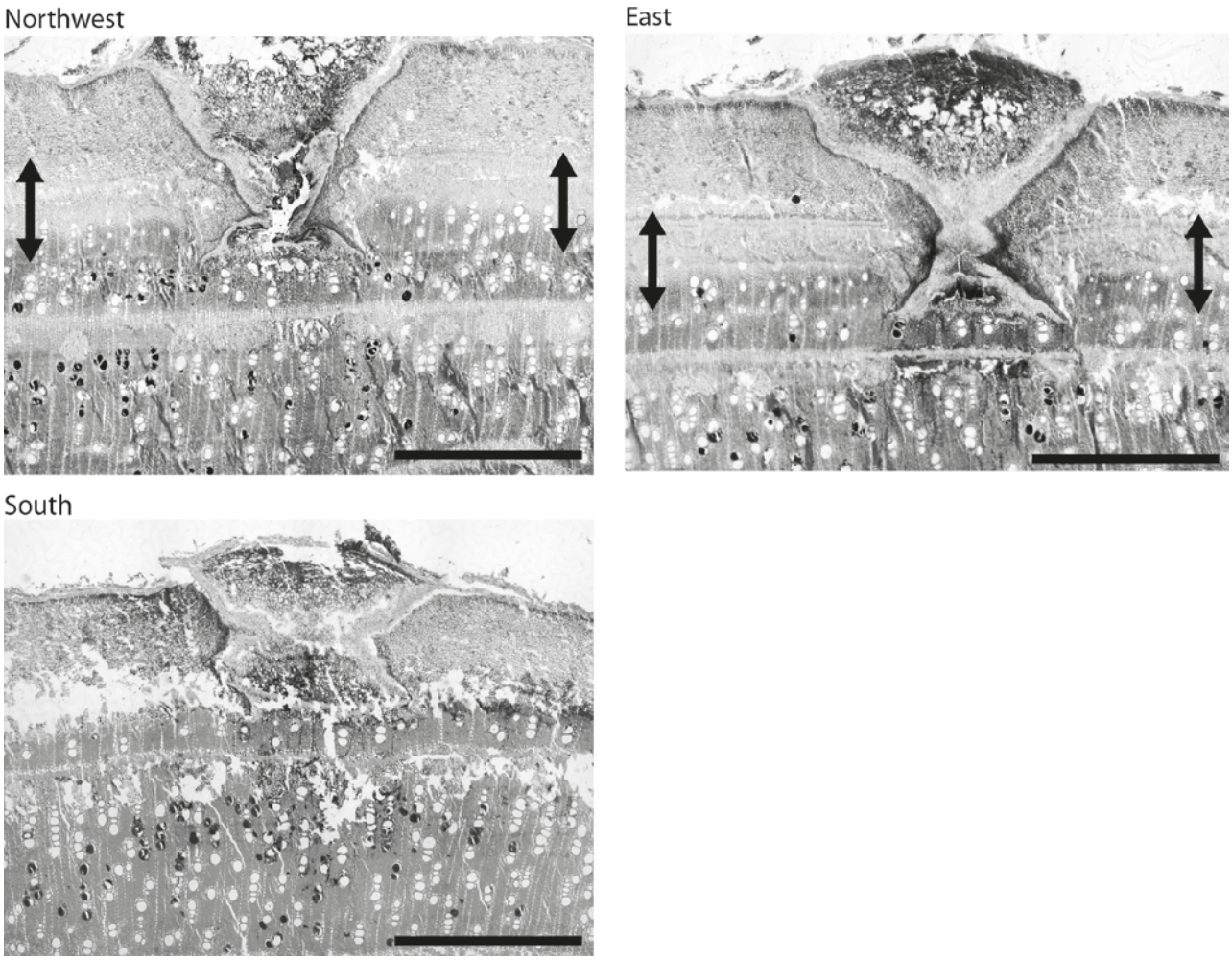


FIG. S3. Wood anatomy of the outer part of the stem at the dendrometer positions of tree A showing the bark tissue (dark blue), the sclereid layers (pink), the xylem tissue (red) with water conducting vessels, the phloem tissue (blue) and the parenchyma cells of the phloem, the xylem and the rays (purple). Thin sections have been double-stained with safranin–alcian blue.

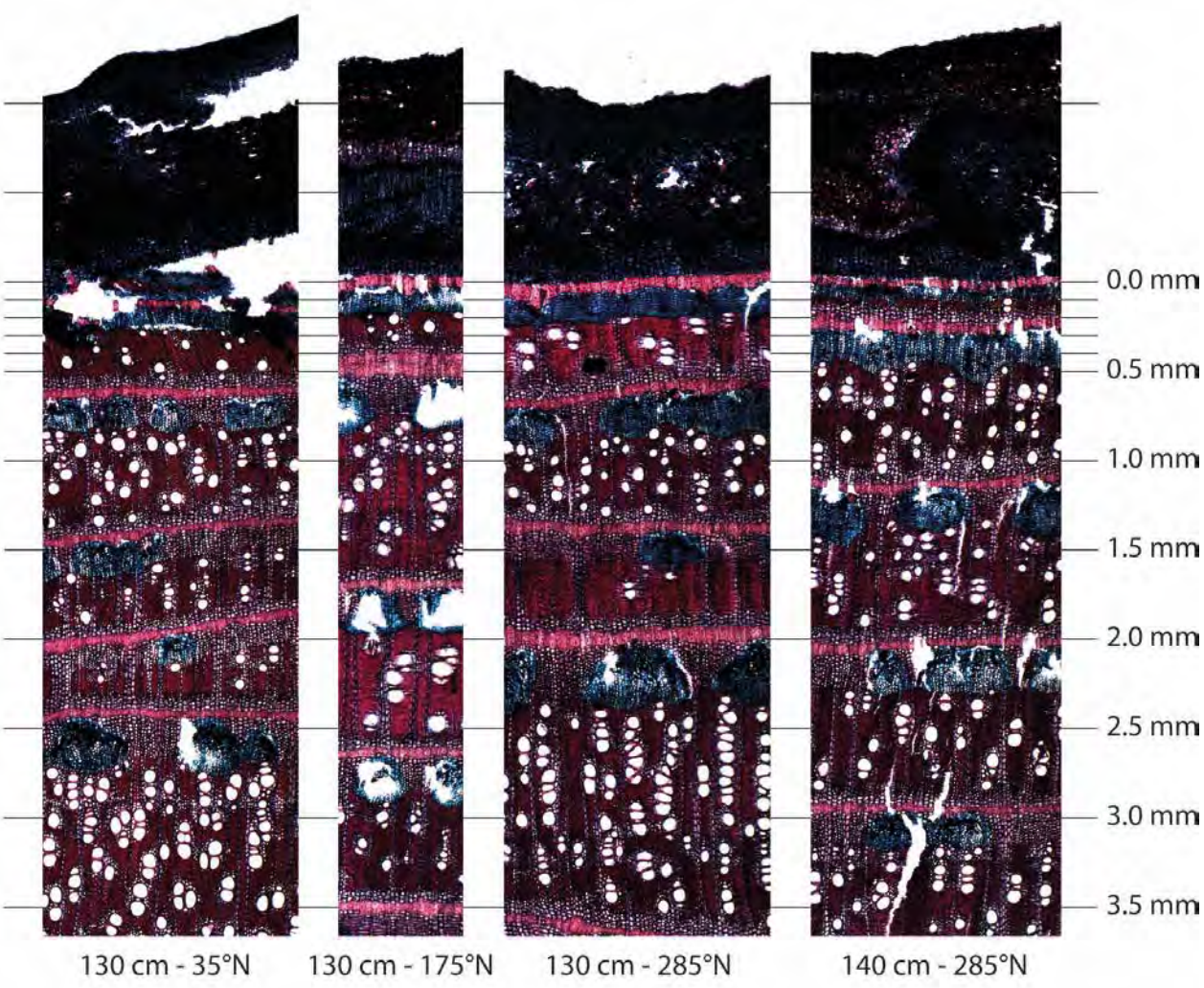


FIG. S4. Wood anatomy of the outer part of the stem at the dendrometer positions of tree B showing the bark tissue (dark blue), the sclereid layers (pink), the xylem tissue (red) with water conducting vessels, the phloem tissue (blue) and the parenchyma cells of the phloem, the xylem and the rays (purple). Thin sections have been double-stained with safranin–alcian blue.

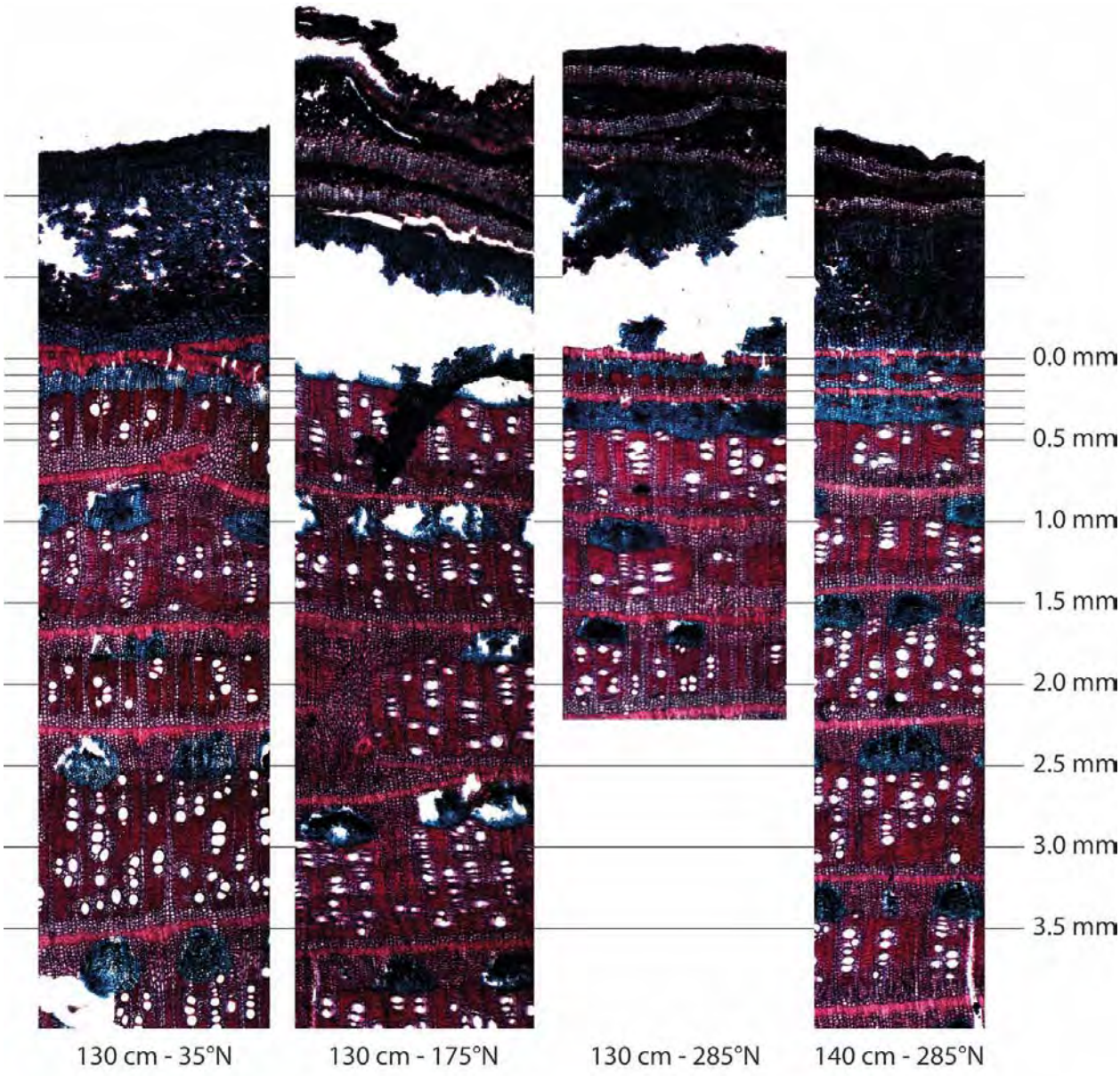
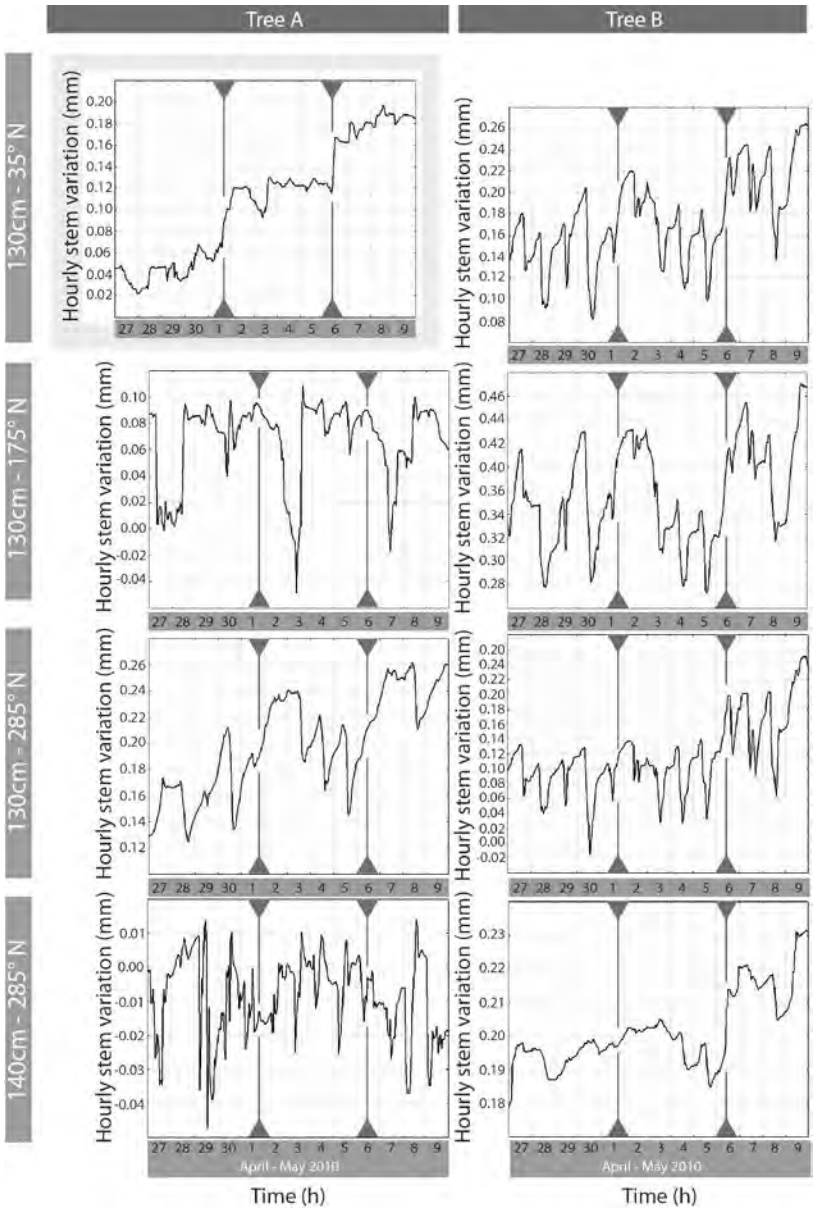
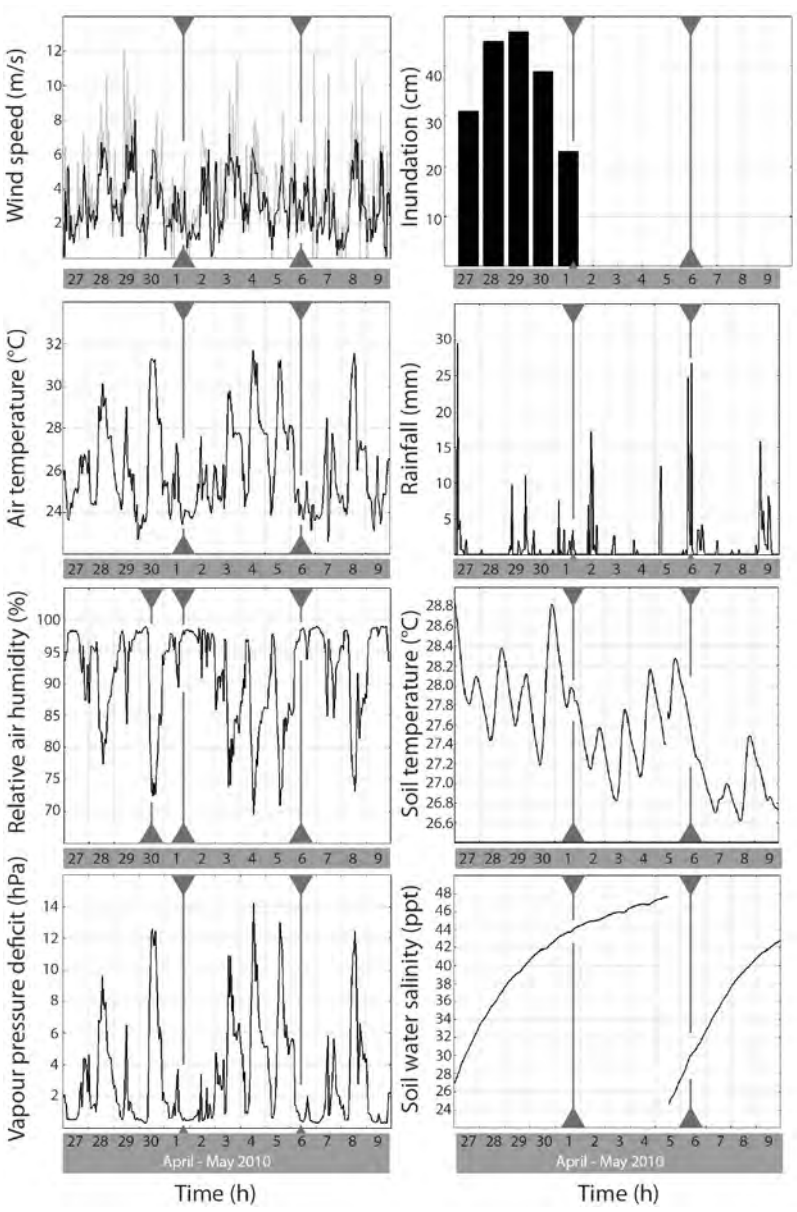
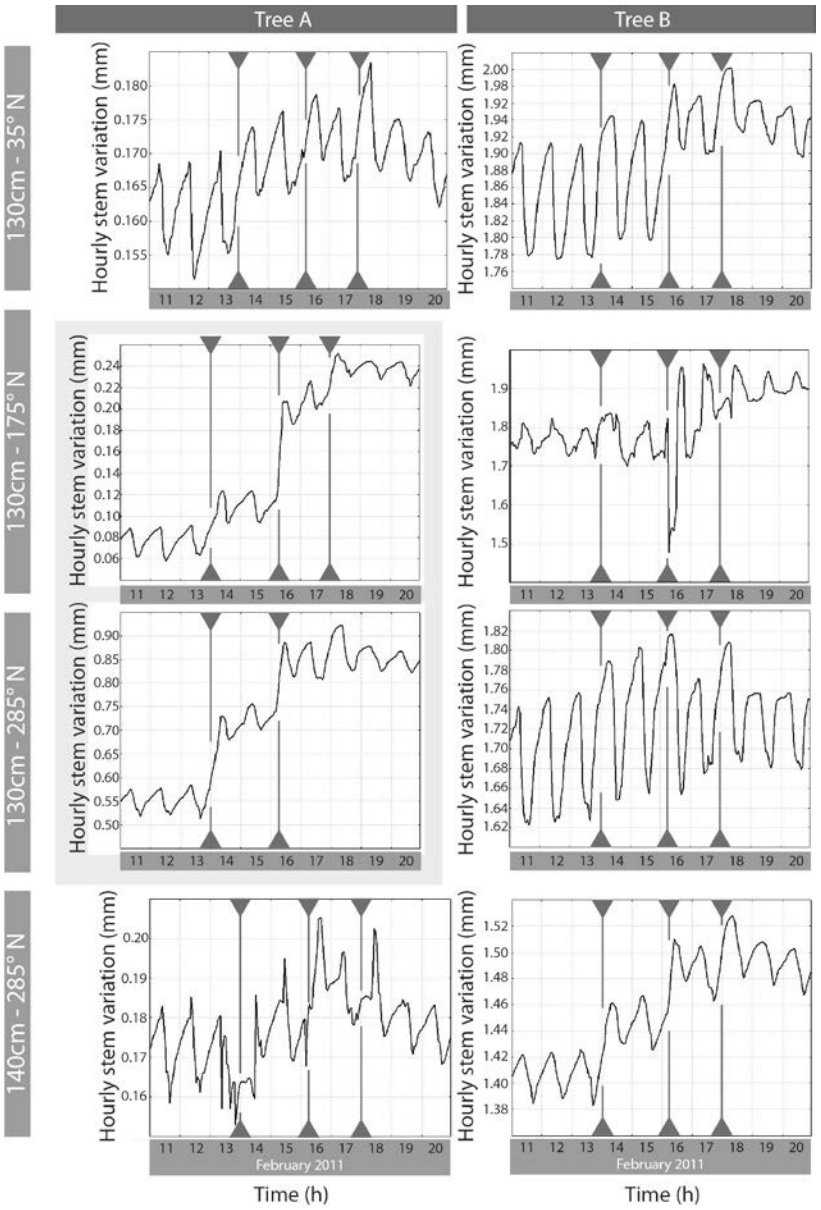
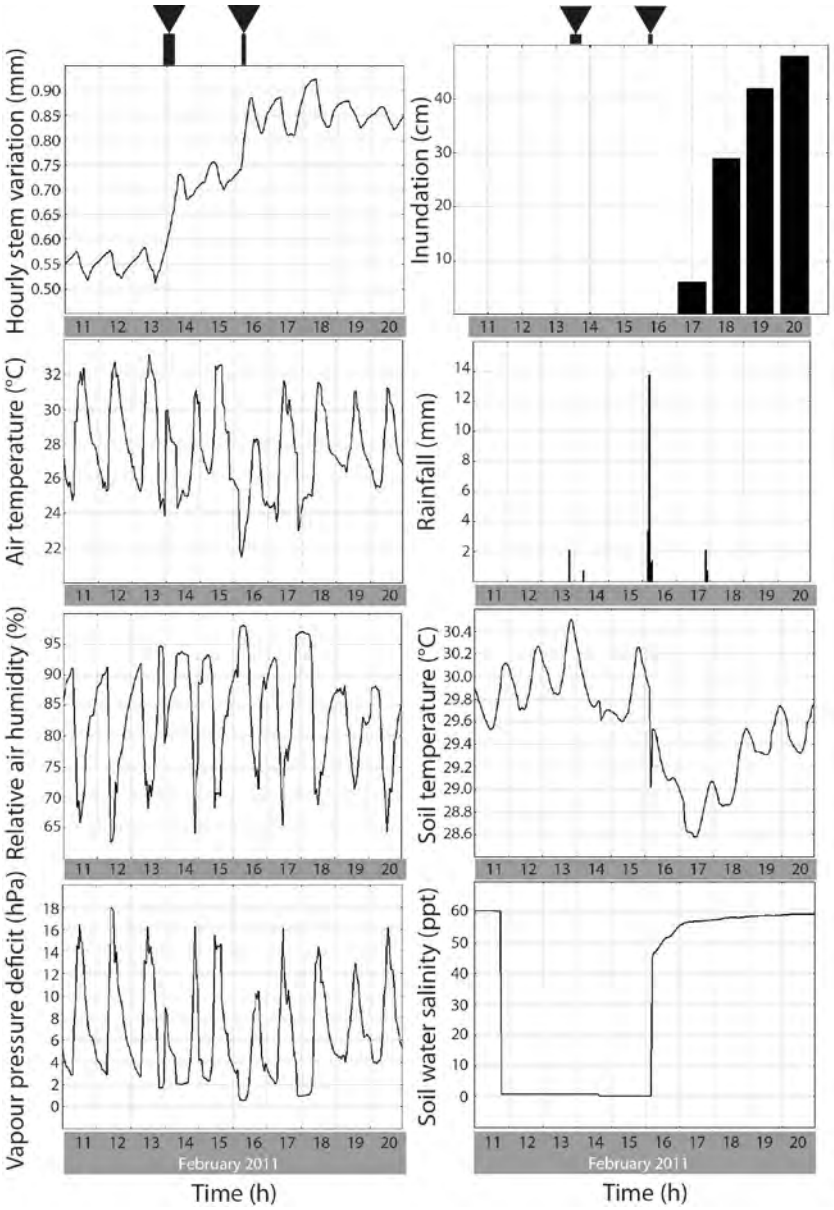


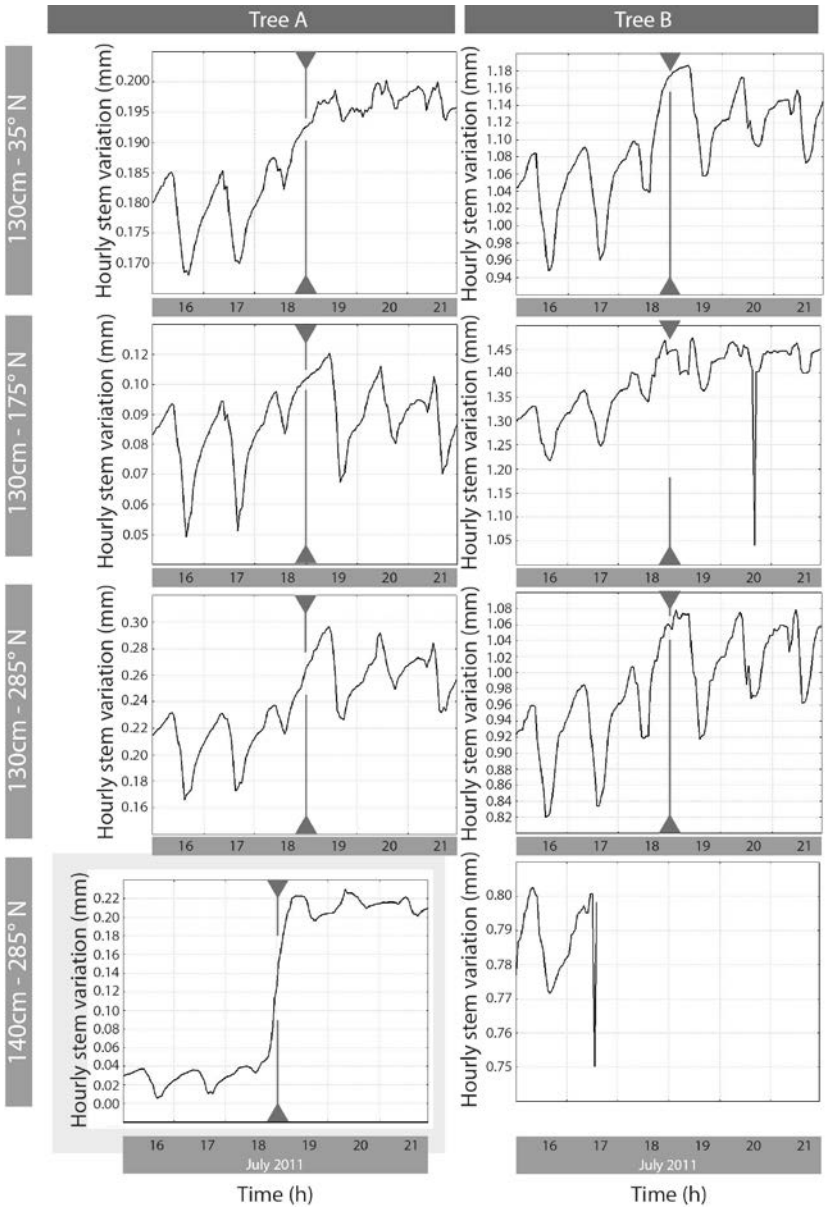
FIG. S5. (following pages) Left: Hourly stem variation at all four positions around and along the stem of tree A and B for the periods of abrupt increase of the stem diameter of tree A (grey box). Grey arrow heads and lines mark the specific hours of strong increase, at the base of the abrupt increase in the stem diameter of tree A, observed on the one-year curves (Fig. 3). Right: Wind speed (black) and maximum daily wind speed (grey), air temperature, relative humidity, vapour pressure deficit, inundation, rainfall, soil temperature and soil water salinity of the same period. Air temperature, relative humidity and vapour pressure deficit data are mean values from two loggers attached to tree A and tree B, standing ca. 5 m apart from each other. Steep decline and increase in the salinity curves are an indication of soil drought rather than an abrupt change in soil water salinity.
Grey arrow heads and lines mark the specific hours of strong increase, at the base of the abrupt increase in the stem diameter of tree A, observed on the one-year curves (Fig. 3).

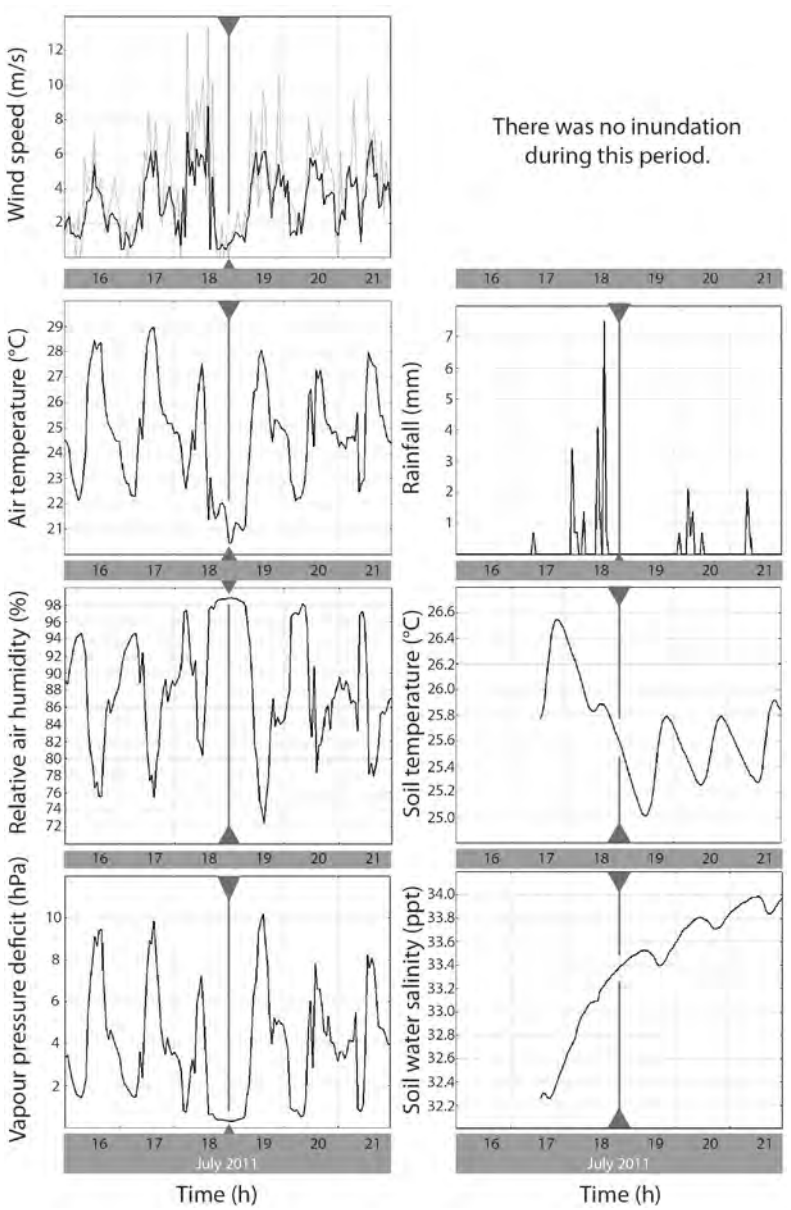

Tree A
Tree B
130cm - 35° N
130cm - 175° N
130cm - 285° N
140cm - 285° N
Hourly stem variation (mm)
27 28 29 30 1 2 3 4 5 6 7 8 9
April - May 2010
Time (h)


Wind speed (m/s)
Inundation (cm)
Air temperature (°C)
Rainfall (mm)
Relative air humidity (%)
Soil temperature (°C)
Vapour pressure deficit (hPa)
Soil water salinity (ppt)
27 28 29 30 1 2 3 4 5 6 7 8 9
April - May 2010
Time (h)


Tree A
Tree B
130cm - 35° N
130cm - 175° N
130cm - 285° N
140cm - 285° N
Hourly stem variation (mm)
February 2011
Time (h)


Hourly stem variation (mm)
Inundation (cm)
Air temperature (°C)
Rainfall (mm)
Relative air humidity (%)
Soil temperature (°C)
Vapour pressure deficit (hPa)
Soil water salinity (ppt)
February 2011
Time (h)

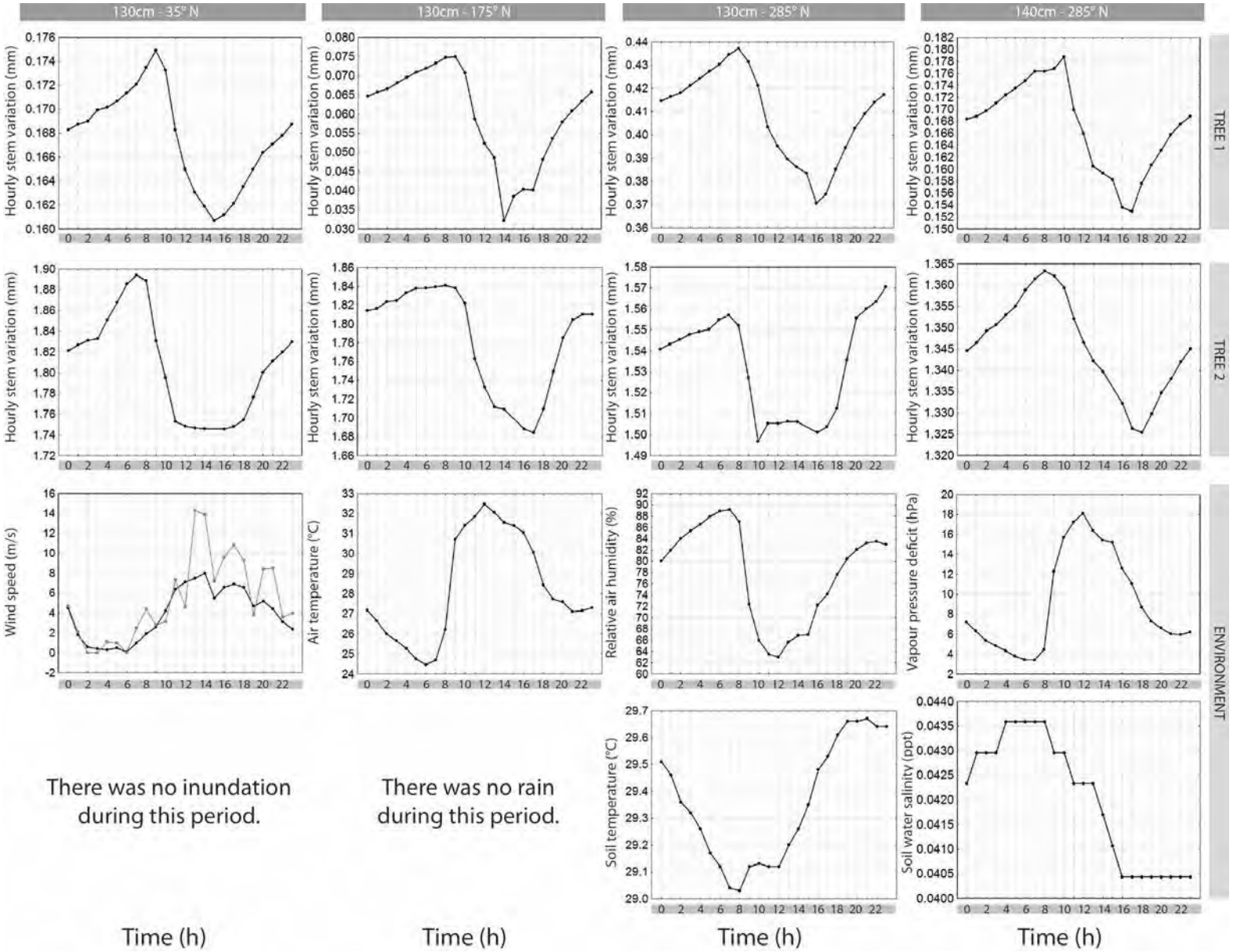


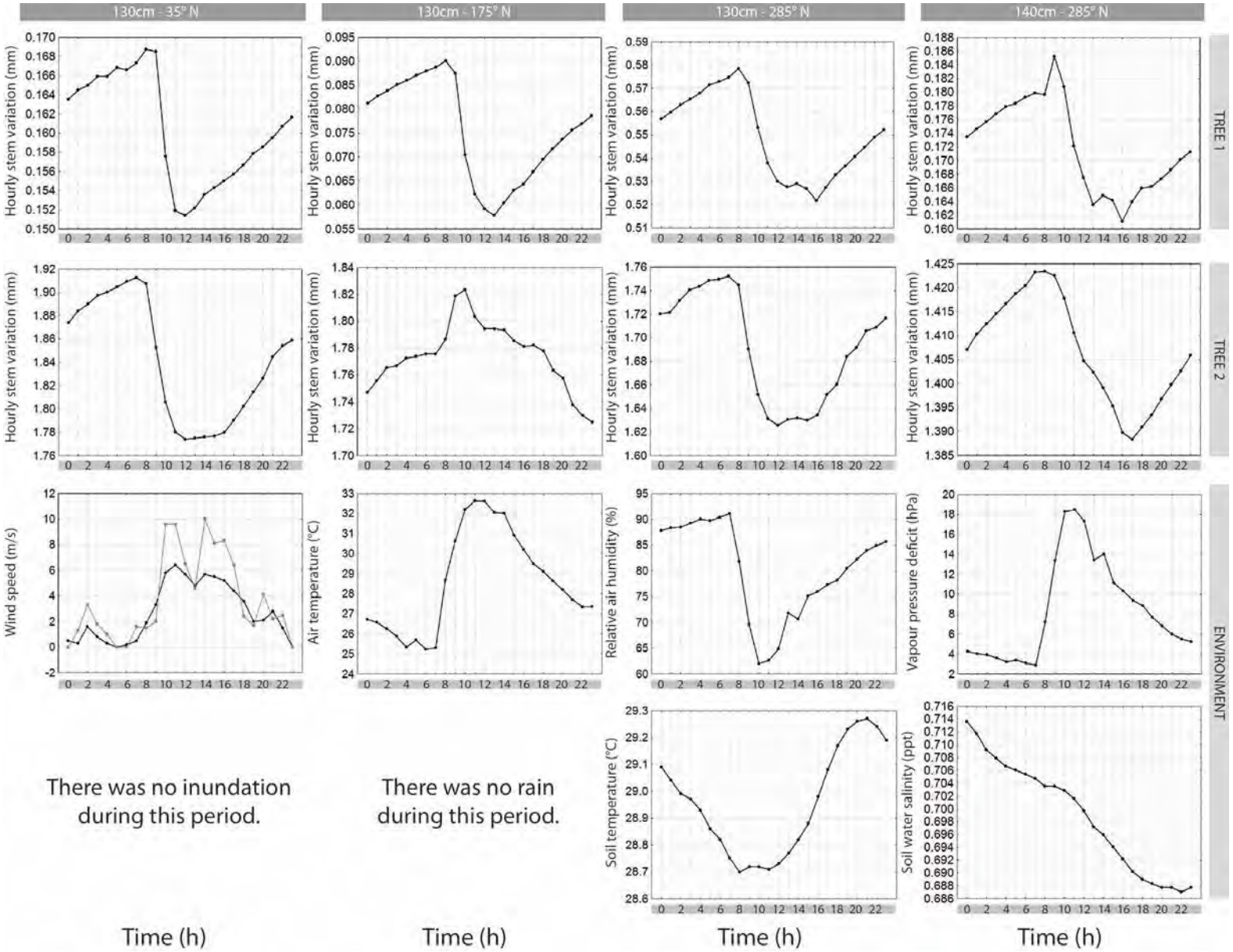


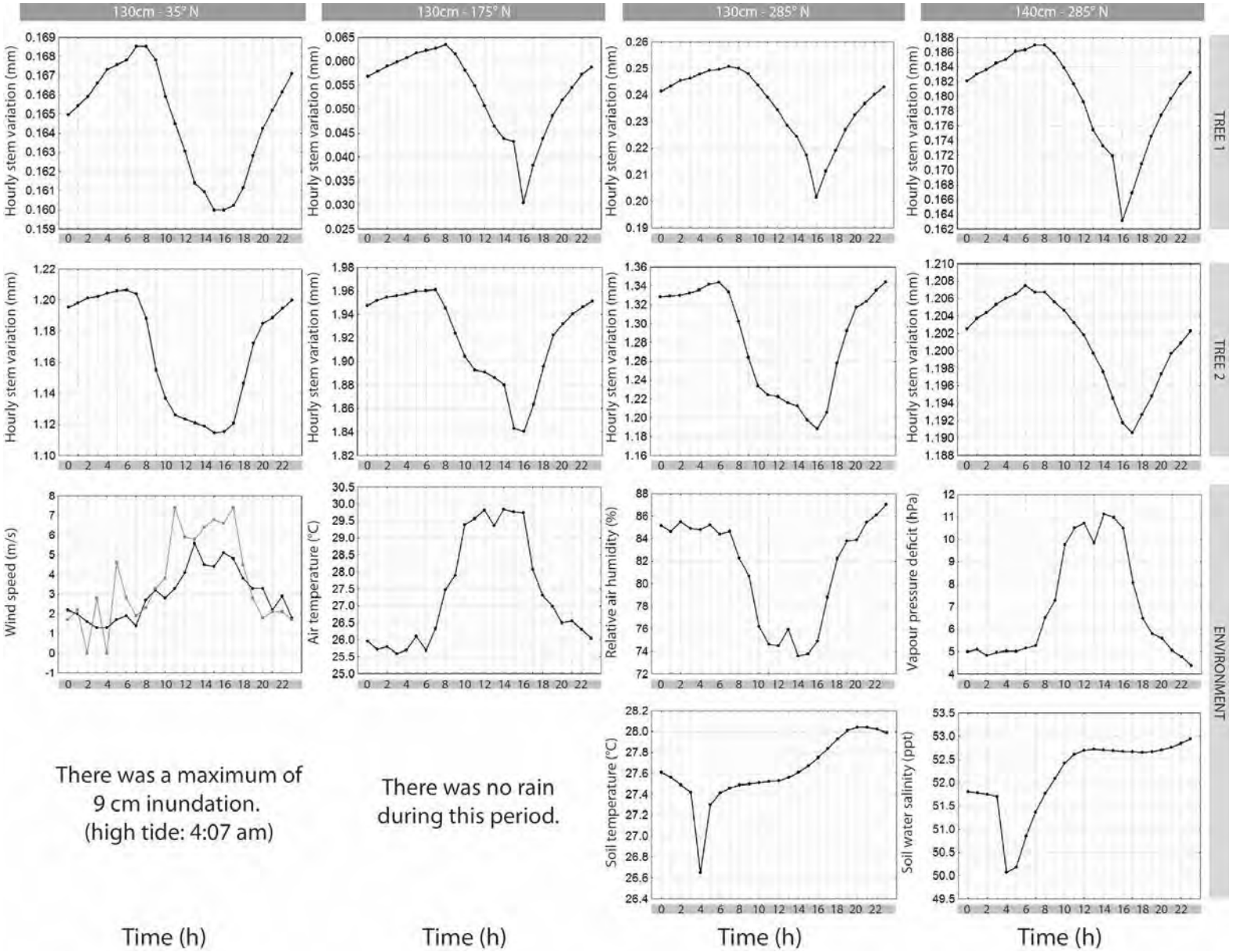
There was no inundation during this period.

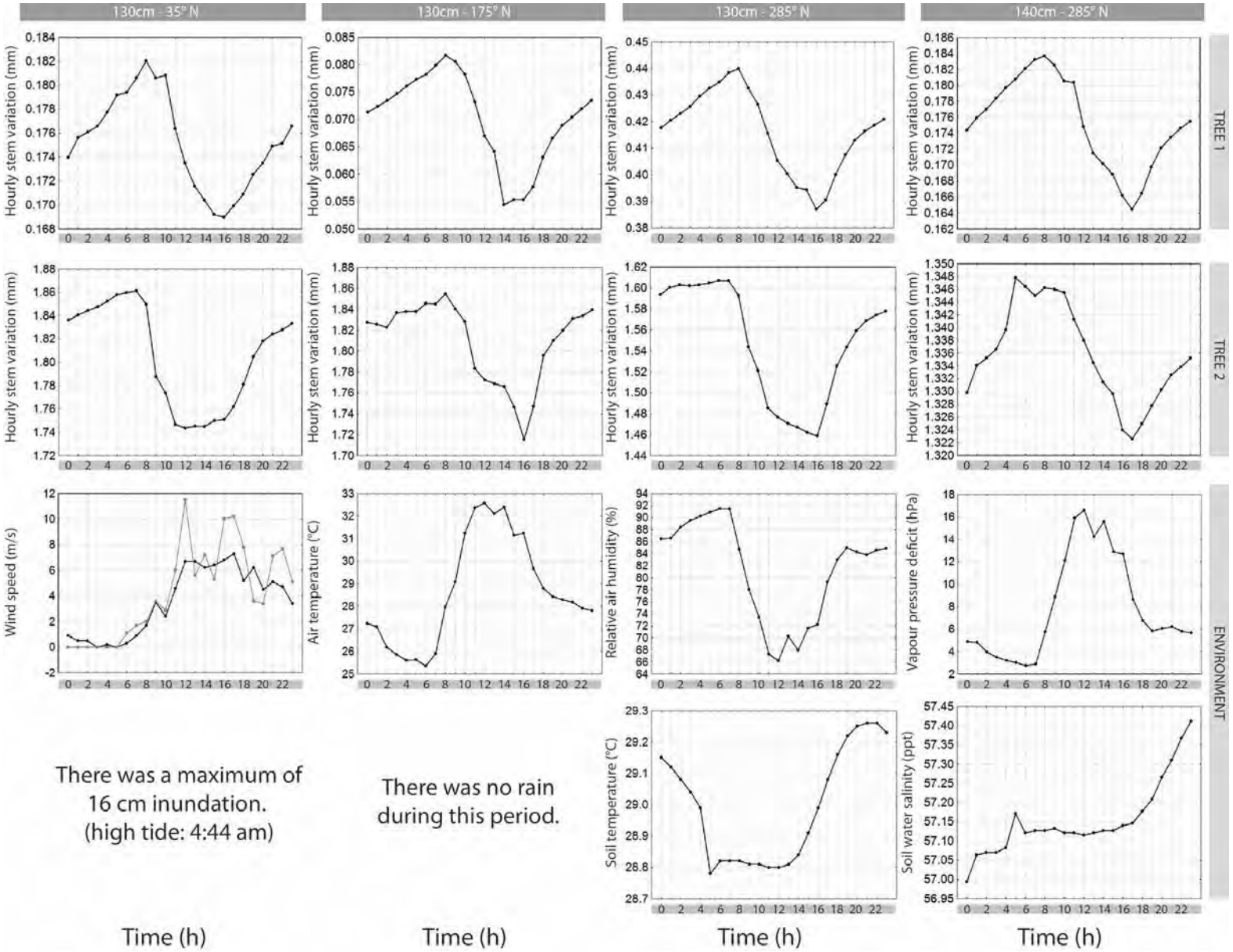
FIG. S6. (following pages) Hourly stem variation at all four positions around and along the stem of tree A and B during eight selected days with or without rain and with or without inundation (page 10: 18/01/2011, page 11: 12/02/2011, page 12: 23/10/2010, page 13: 05/01/2011, page 14: 06/05/2010, page 15: 09/05/2010, page 16: 27/04/2010, page 17: 27/05/2010 - see also table below). Wind speed, air temperature, relative humidity, vapour pressure deficit, inundation, rainfall, soil temperature and soil water salinity of the same days. Air temperature, relative humidity and vapour pressure deficit data are mean values from two loggers attached to tree A and tree B, standing ca. 5 m apart from each other.

	days without rainfall	days with rainfall
days without inundation	18th of January 2011 (p.11)	6th of May 2010 (p. 15)
	12th of February 2011 (p.12)	9th of May 2010 (p. 16)
days with inundation	23rd of October 2010 (p. 13)	27th of April 2010 (p. 17)
	5th of January 2011 (p. 14)	27 of May 2010 (p. 18)

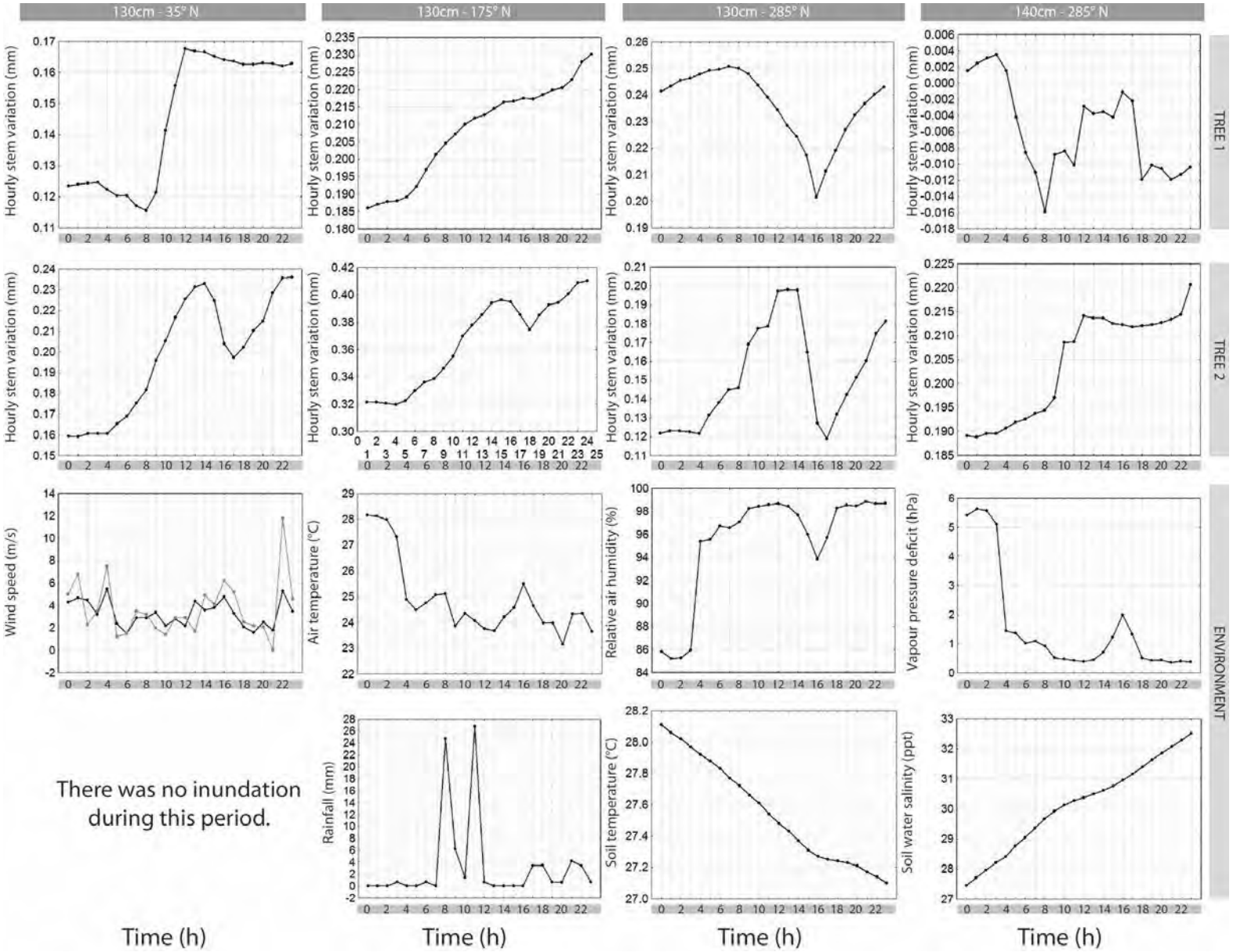

130cm - 35° N
130cm - 175° N
130cm - 285° N
140cm - 285° N
TREE 1
TREE 2
ENVIRONMENT
Hourly stem variation (mm)
Wind speed (m/s)
Air temperature (°C)
Relative air humidity (%)
Vapour pressure deficit (hPa)
Soil temperature (°C)
Soil water salinity (ppt)
There was no inundation during this period.
There was no rain during this period.
Time (h)
Time (h)
Time (h)
Time (h)

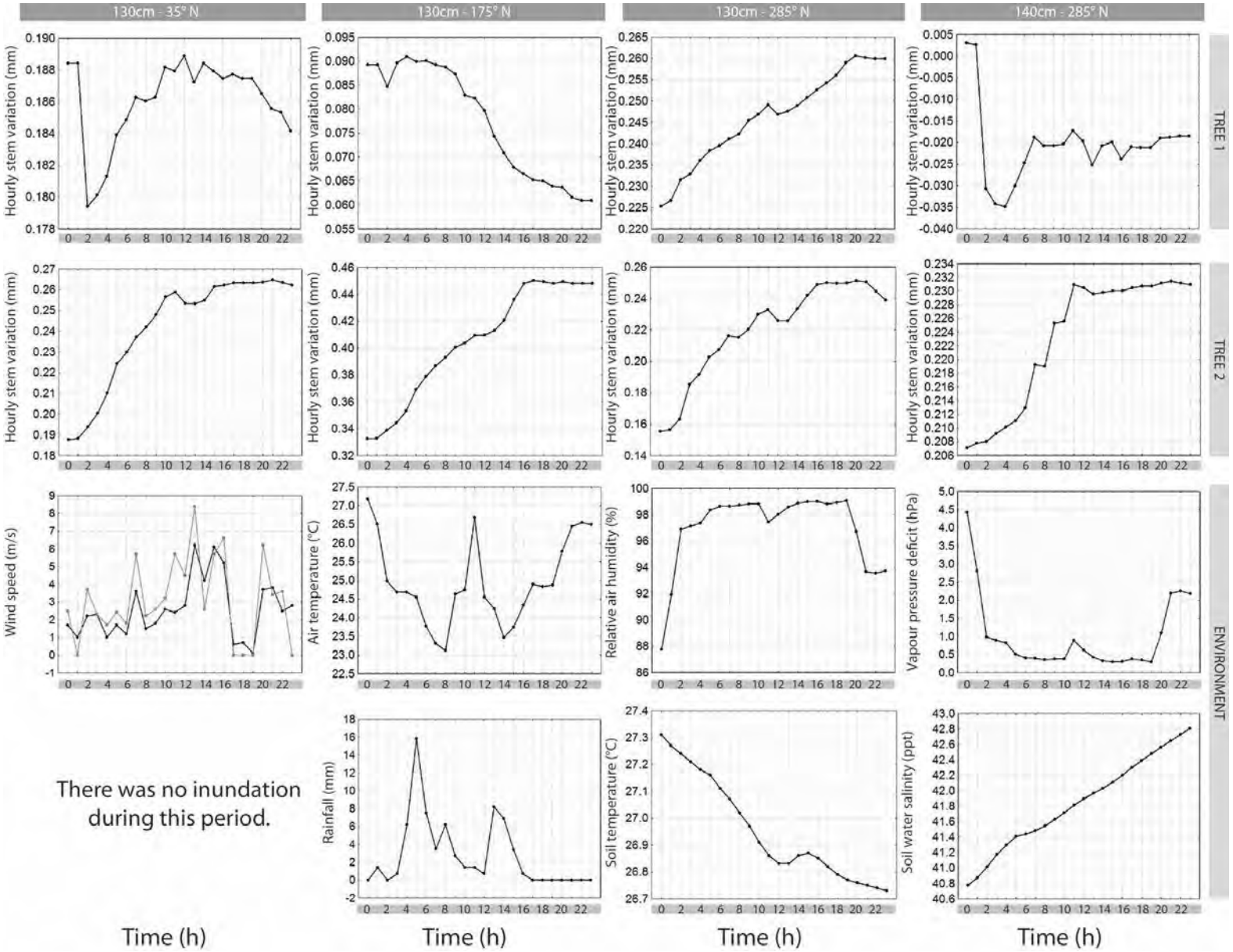

130cm - 35° N
130cm - 175° N
130cm - 285° N
140cm - 285° N
TREE 1
TREE 2
ENVIRONMENT
Hourly stem variation (mm)
Wind speed (m/s)
Air temperature (°C)
Relative air humidity (%)
Vapour pressure deficit (hPa)
Soil temperature (°C)
Soil water salinity (ppt)
There was no inundation during this period.
There was no rain during this period.
Time (h)
Time (h)
Time (h)
Time (h)

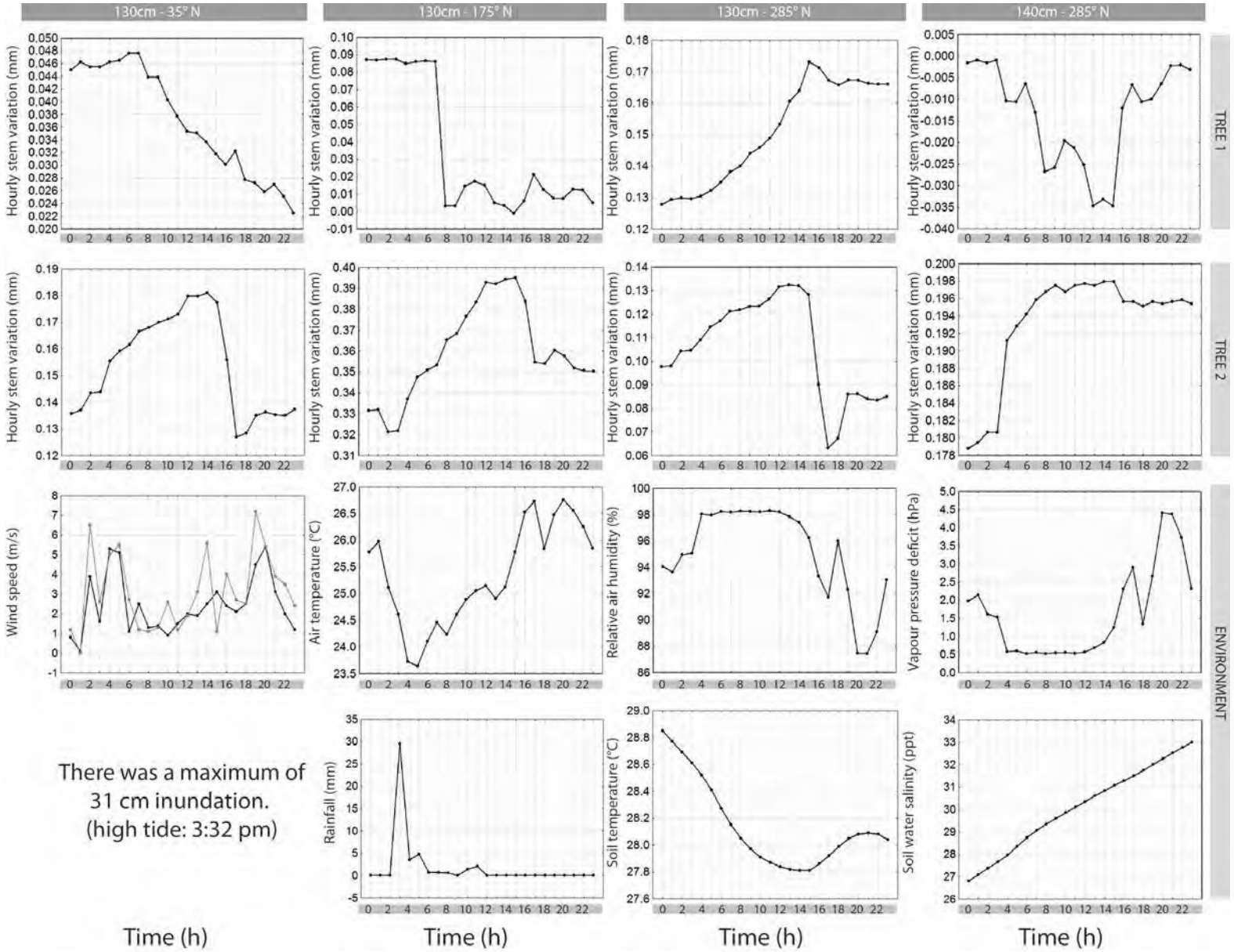

130cm - 35° N
130cm - 175° N
130cm - 285° N
140cm - 285° N
TREE 1
TREE 2
ENVIRONMENT
Hourly stem variation (mm)
Wind speed (m/s)
Air temperature (°C)
Relative air humidity (%)
Vapour pressure deficit (hPa)
Soil temperature (°C)
Soil water sallinity (ppt)
There was a maximum of 9 cm inundation. (high tide: 4:07 am)
There was no rain during this period.
Time (h)
Time (h)
Time (h)
Time (h)

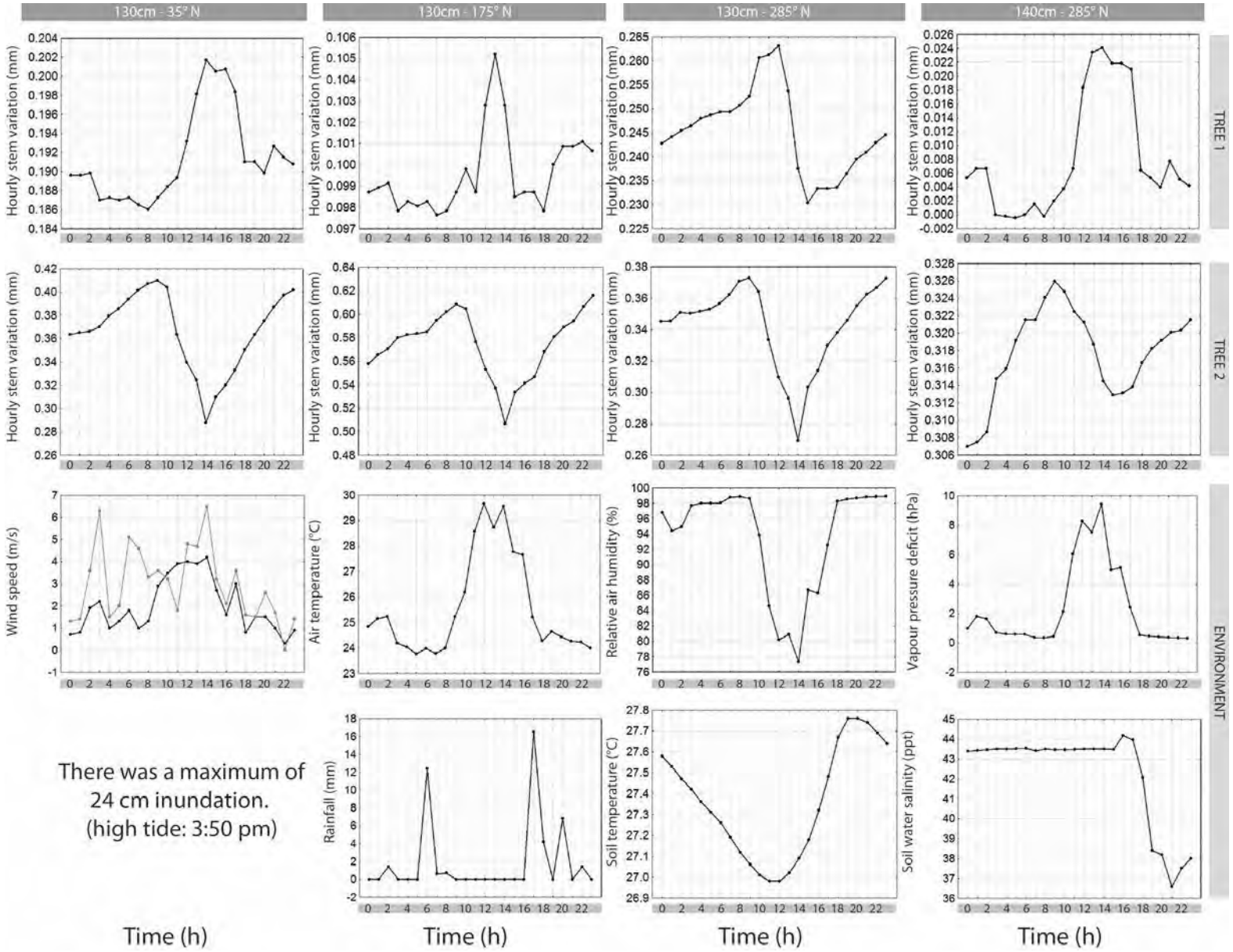

130cm - 35° N
130cm - 175° N
130cm - 285° N
140cm - 285° N
TREE 1
TREE 2
ENVIRONMENT
Hourly stem variation (mm)
Wind speed (m/s)
Air temperature (°C)
Relative air humidity (%)
Vapour pressure deficit (hPa)
Soil temperature (°C)
Soil water salinity (ppt)
There was a maximum of 16 cm inundation. (high tide: 4:44 am)
There was no rain during this period.
Time (h)
Time (h)
Time (h)
Time (h)

4


130cm - 35° N
130cm - 175° N
130cm - 285° N
140cm - 285° N
TREE 1
TREE 2
ENVIRONMENT
Hourly stem variation (mm)
Wind speed (m/s)
Air temperature (°C)
Relative air humidity (%)
Vapour pressure deficit (hPa)
Rainfall (mm)
Soil temperature (°C)
Soil water sallinity (ppt)
There was no inundation during this period.
Time (h)
Time (h)
Time (h)
Time (h)


130cm - 35° N
130cm - 175° N
130cm - 285° N
140cm - 285° N
TREE 1
TREE 2
ENVIRONMENT
Hourly stem variation (mm)
Wind speed (m/s)
Air temperature (°C)
Relative air humidity (%)
Vapour pressure deficit (hPa)
Rainfall (mm)
Soil temperature (°C)
Soil water sallinity (ppt)
There was no inundation during this period.
Time (h)


130cm - 35° N
130cm - 175° N
130cm - 285° N
140cm - 285° N
TREE 1
TREE 2
ENVIRONMENT
Hourly stem variation (mm)
Wind speed (m/s)
Air temperature (°C)
Relative air humidity (%)
Vapour pressure deficit (hPa)
Rainfall (mm)
Soil temperature (°C)
Soil water sallinity (ppt)
There was a maximum of
31 cm inundation.
(high tide: 3:32 pm)
Time (h)


130cm - 35° N
130cm - 175° N
130cm - 285° N
140cm - 285° N
TREE 1
TREE 2
ENVIRONMENT
Hourly stem variation (mm)
Wind speed (m/s)
Air temperature (°C)
Relative air humidity (%)
Vapour pressure deficit (hPa)
Rainfall (mm)
Soil temperature (°C)
Soil water sallinity (ppt)
There was a maximum of
24 cm inundation.
(high tide: 3:50 pm)
Time (h)