



EVAPOTRANSPIRATION OBSERVED in a MIXED FOREST in the SEOLMACHEON CATCHMENT

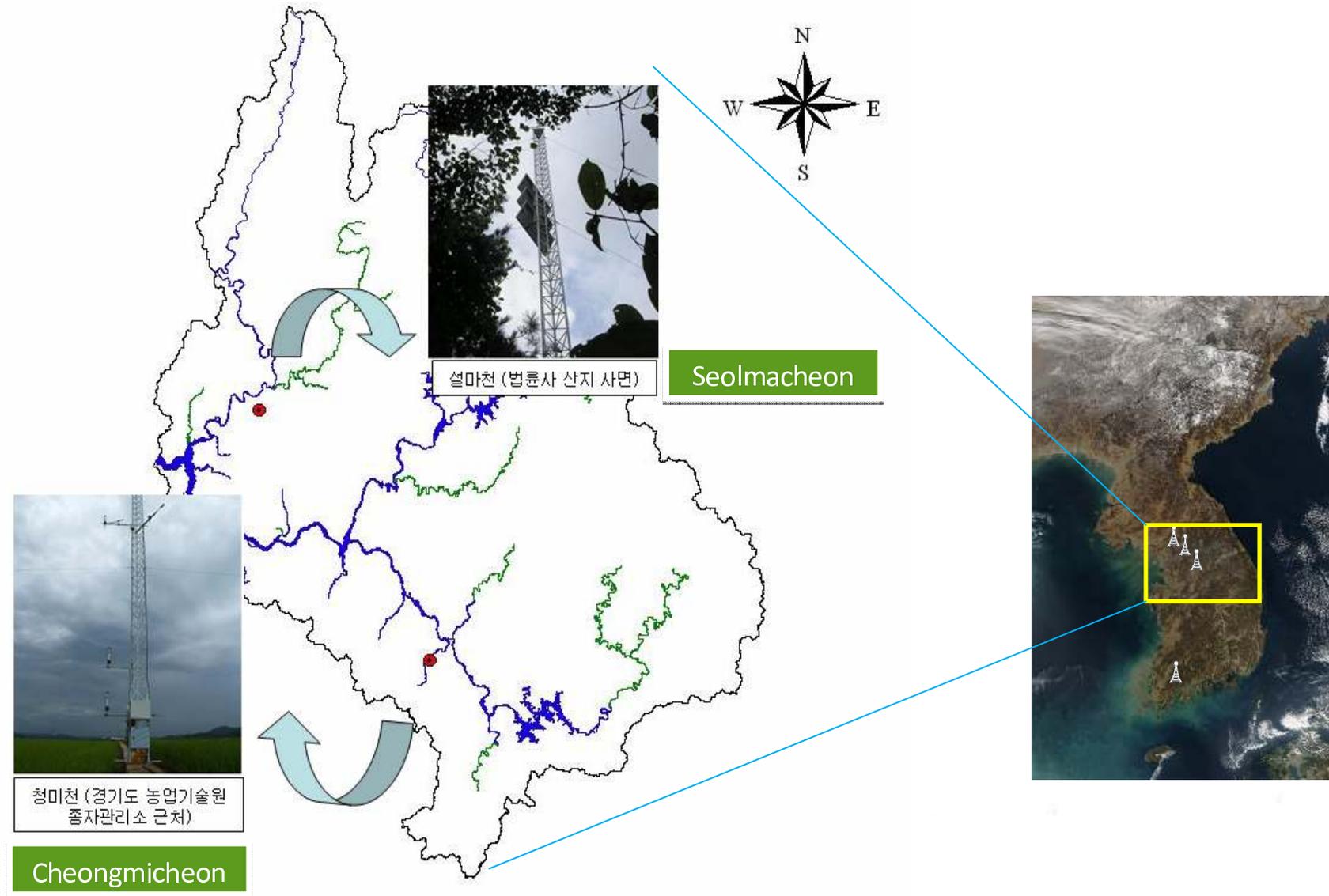


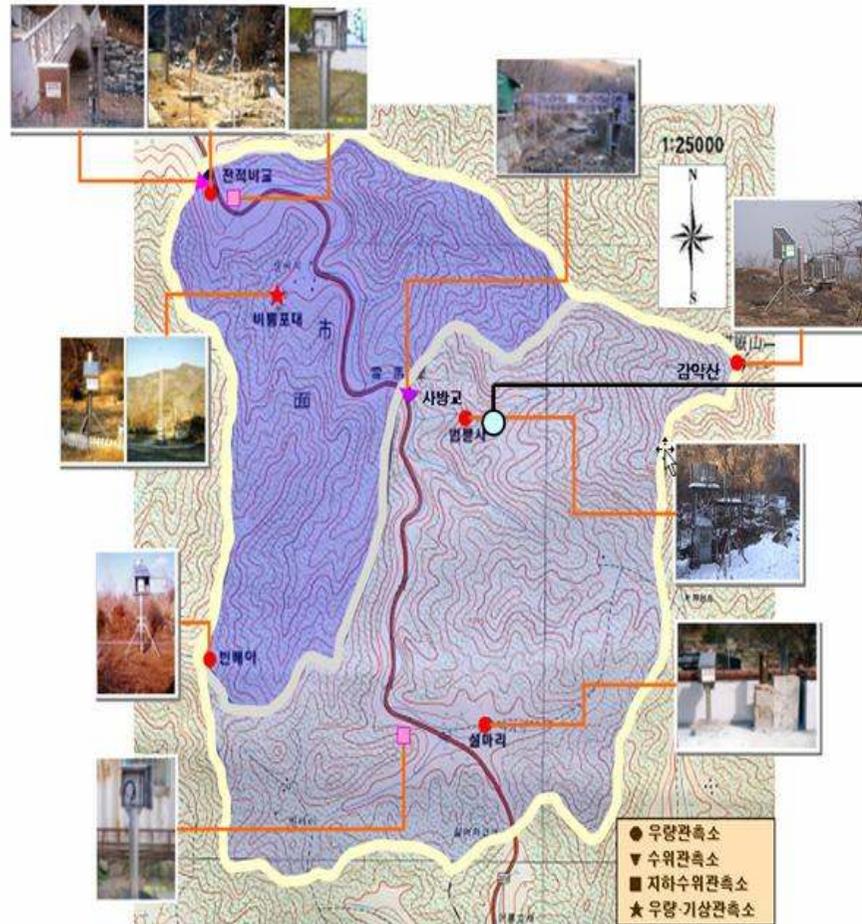
Hyojung Kwon, Minseok Kang, Juyeol Yun, Joon Kim



(1) Document the seasonal and interannual variations of the measured evapotranspiration (ET)

(2) Diagnose the controlling mechanisms of ET from the mixed forest at the Seolmacheon catchment





플럭스 타워 설치 지역

- Catchment size: 8.5km²
- Ecosystem type: a mixed forest with the age of 20 ~ 40 years
- NW side: *Quercus variaabilis*, cork oak; *Quercus mongolica*; *Quercus serrata*, konara oak
- SE side: *pinus koraiensis*
- A thin soil layer

Instrumentation



WXT510(T,RH,P,WS,
WD,Pre,19.2 m)



CNR2(NetSW, NetLW, 19.2m)



CSAT3((T,u,v,w,19.2m)



LI7500(CO2/H2O,
P,19.2m)



RMY81000(T,u,v,
w,19.2m)



CS616(SWC, 0.1m)



TCAV
(Tsoil 0~5cm
Tsoil 5~10cm
Tsoil 10~20cm)

3 Solar panel

Cabinet(Ground)
Battery
2 of 200A
1 of 100A



RMY81000
(T,u,v,w,15m)

RMY81000
(T,u,v,w,2m)

WXT510(T,RH,P,WS,
WD,Pre, 2m)

CR3000, 1m

CR800, 1m



KoFlux Standardized Data Processing

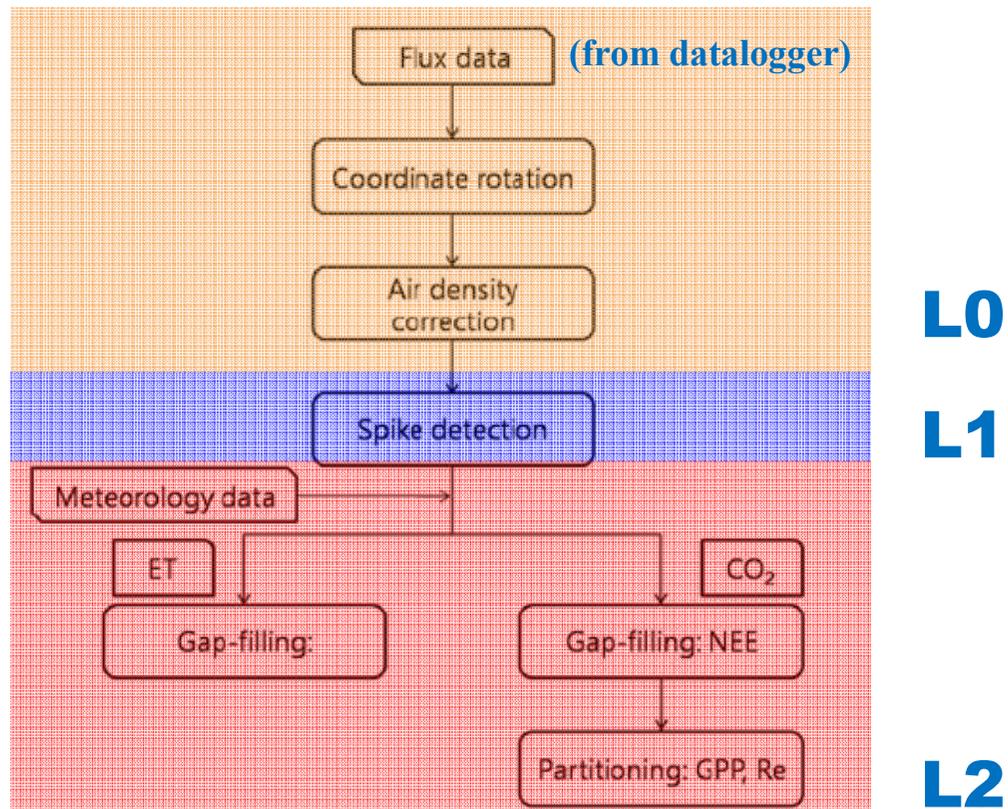
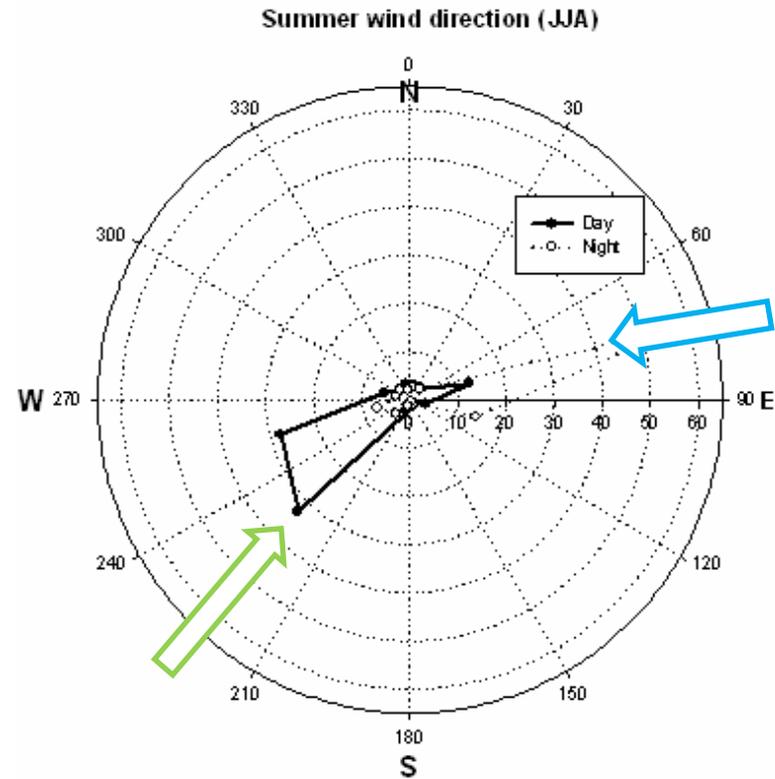
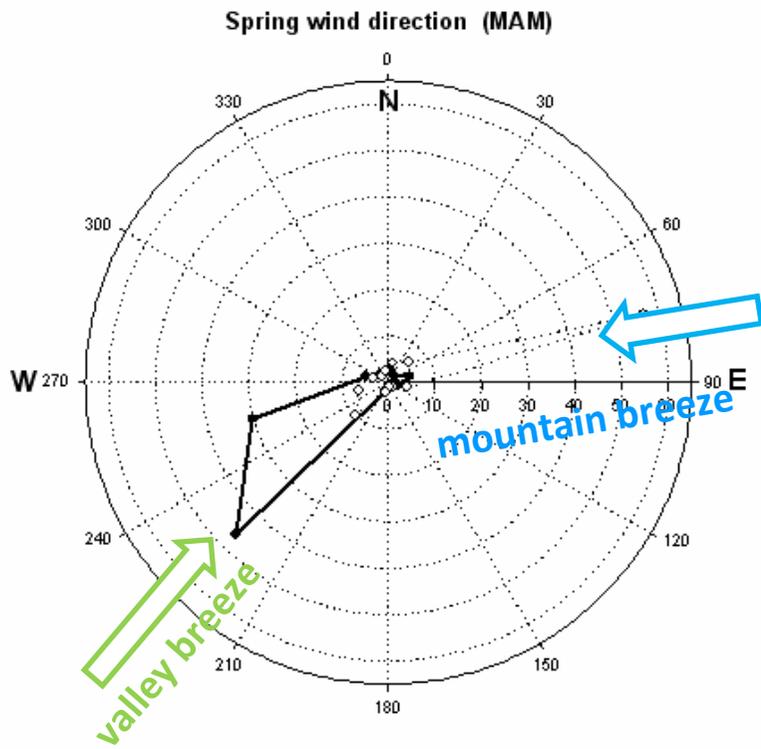
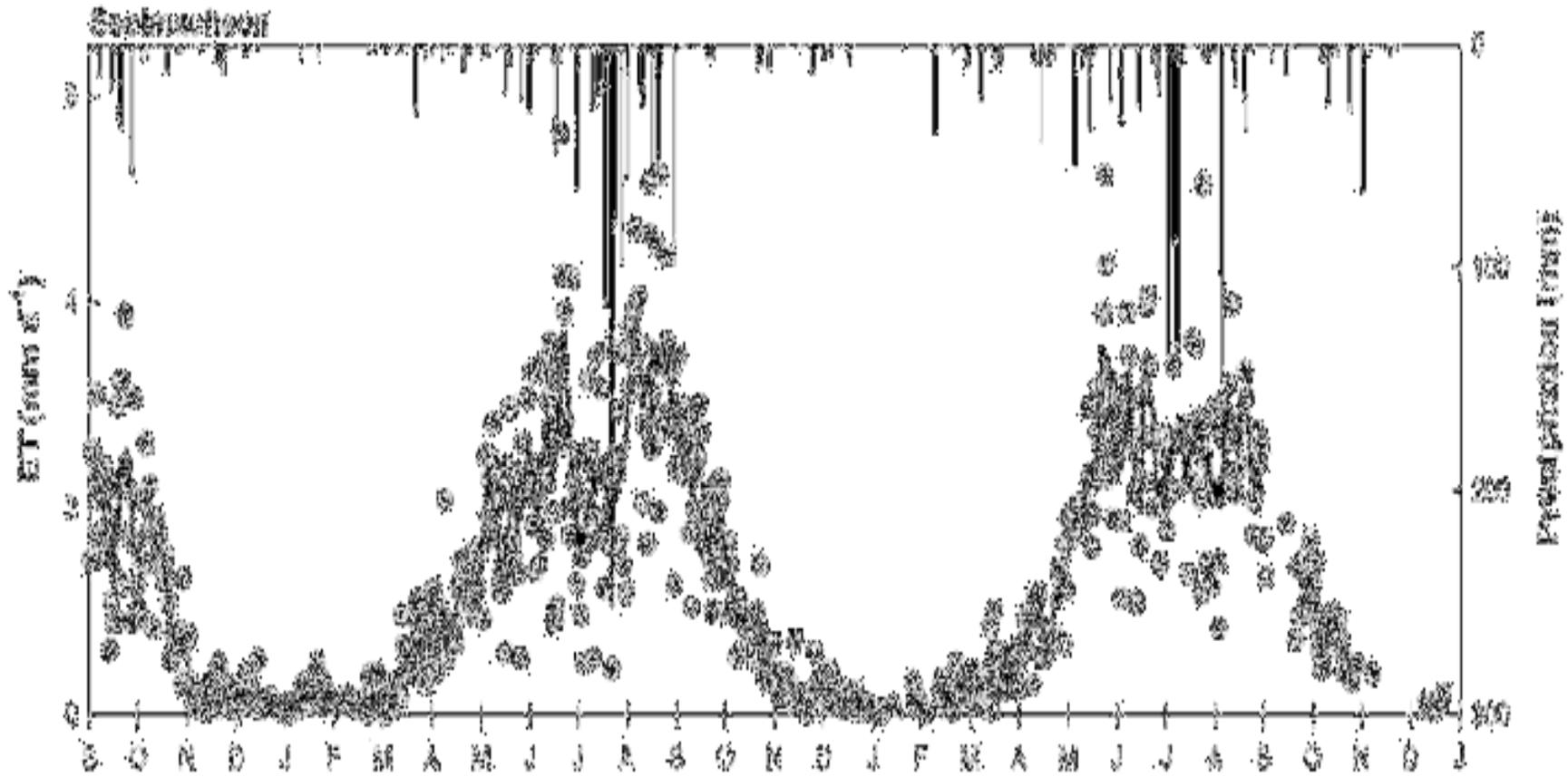


Fig. 1. Flowchart of data processing in KoFlux.

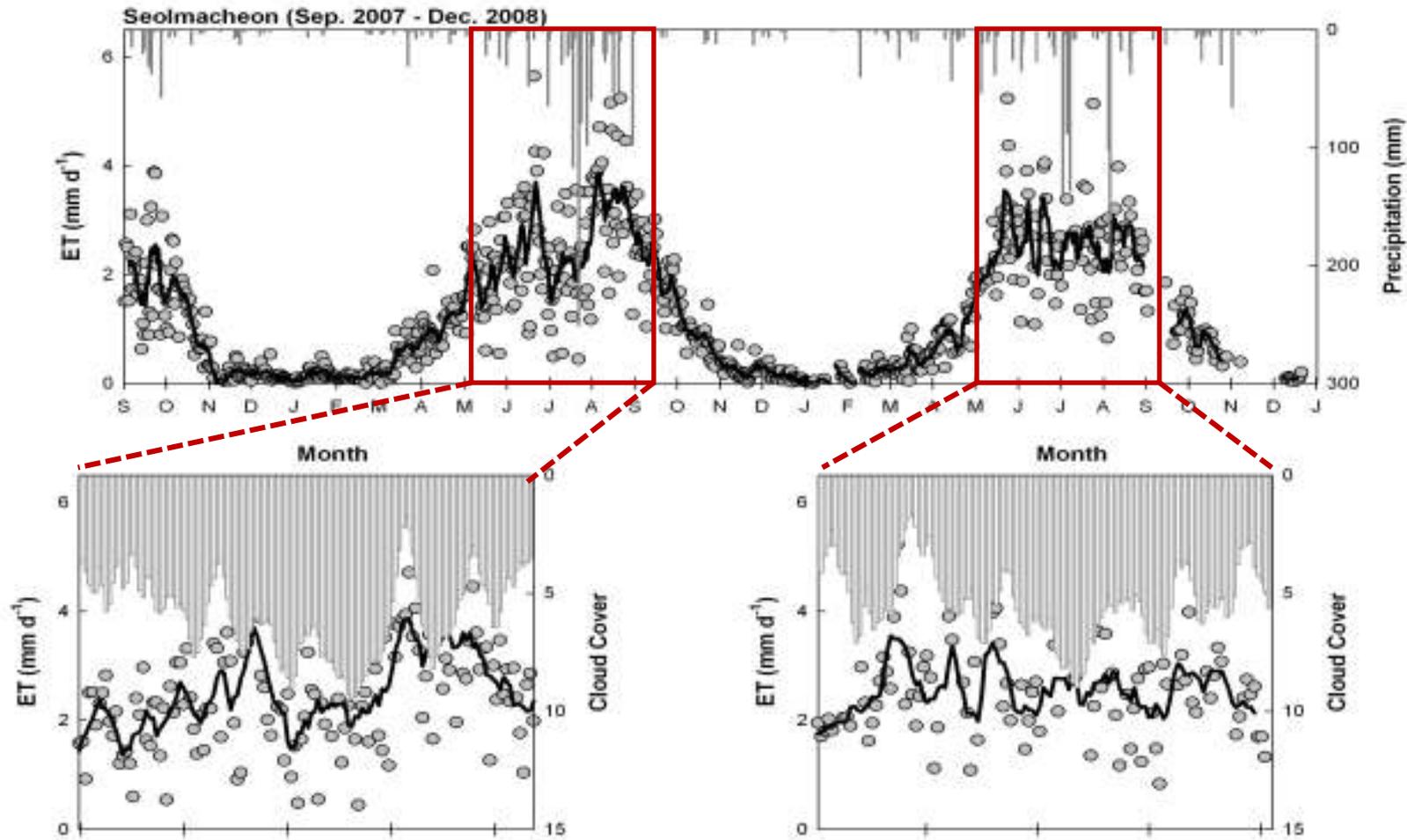
RESULTS : WIND DIRECTION



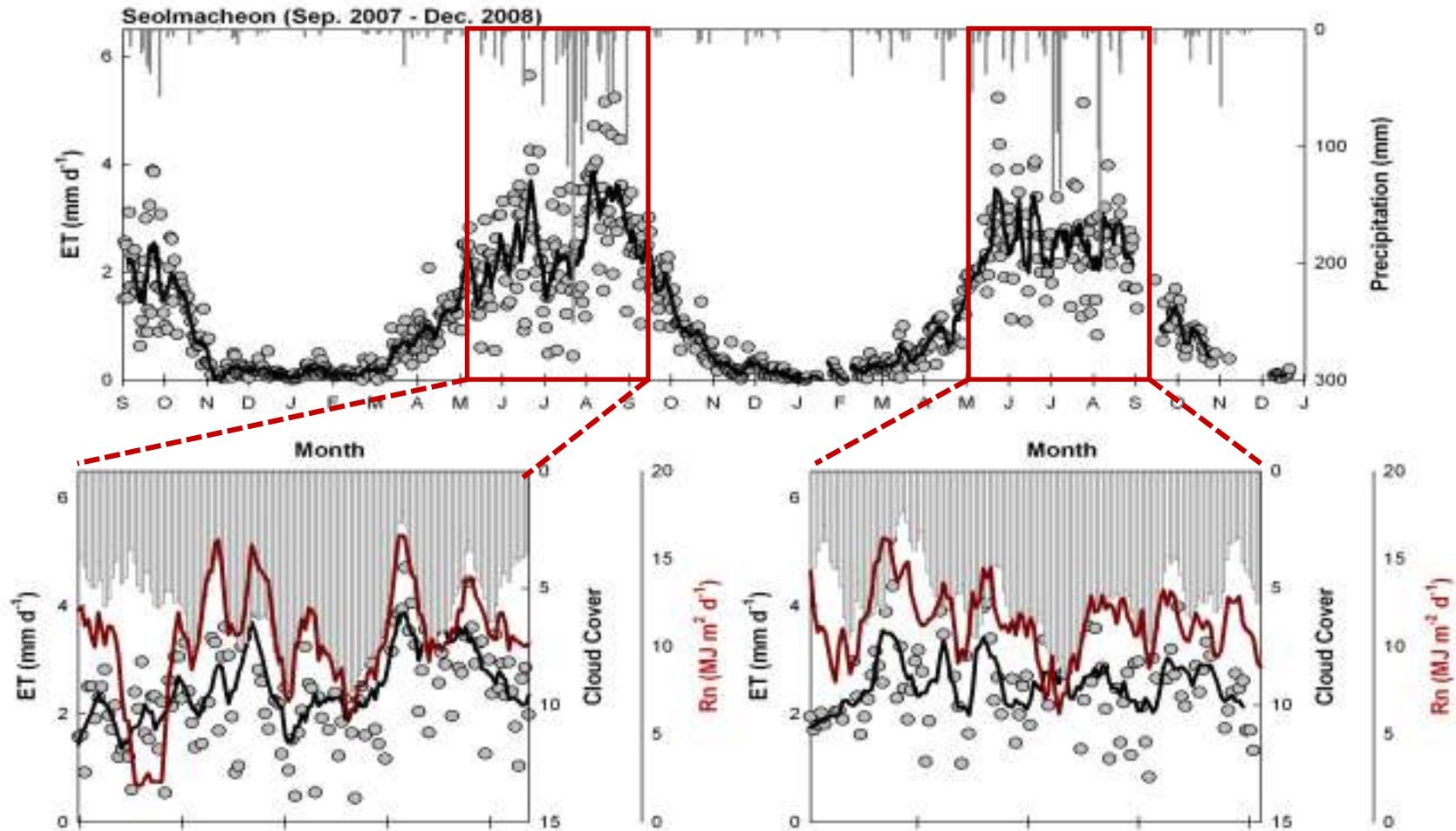
RESULTS : DIURNAL VARIATION OF ET



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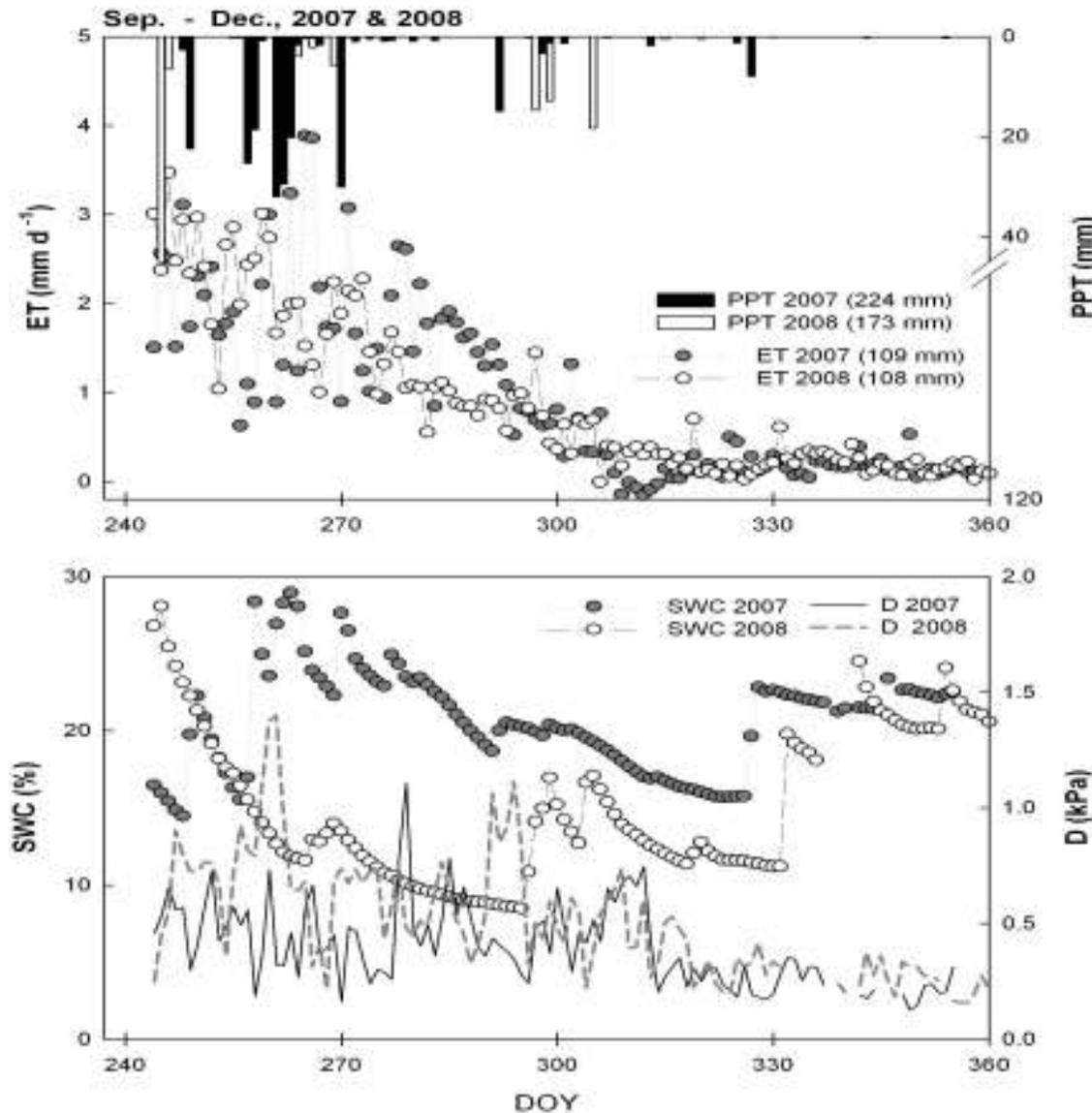


RESULTS : DIURNAL VARIATION OF ET



RESULTS : SOIL MOISTURE INFLUENCE

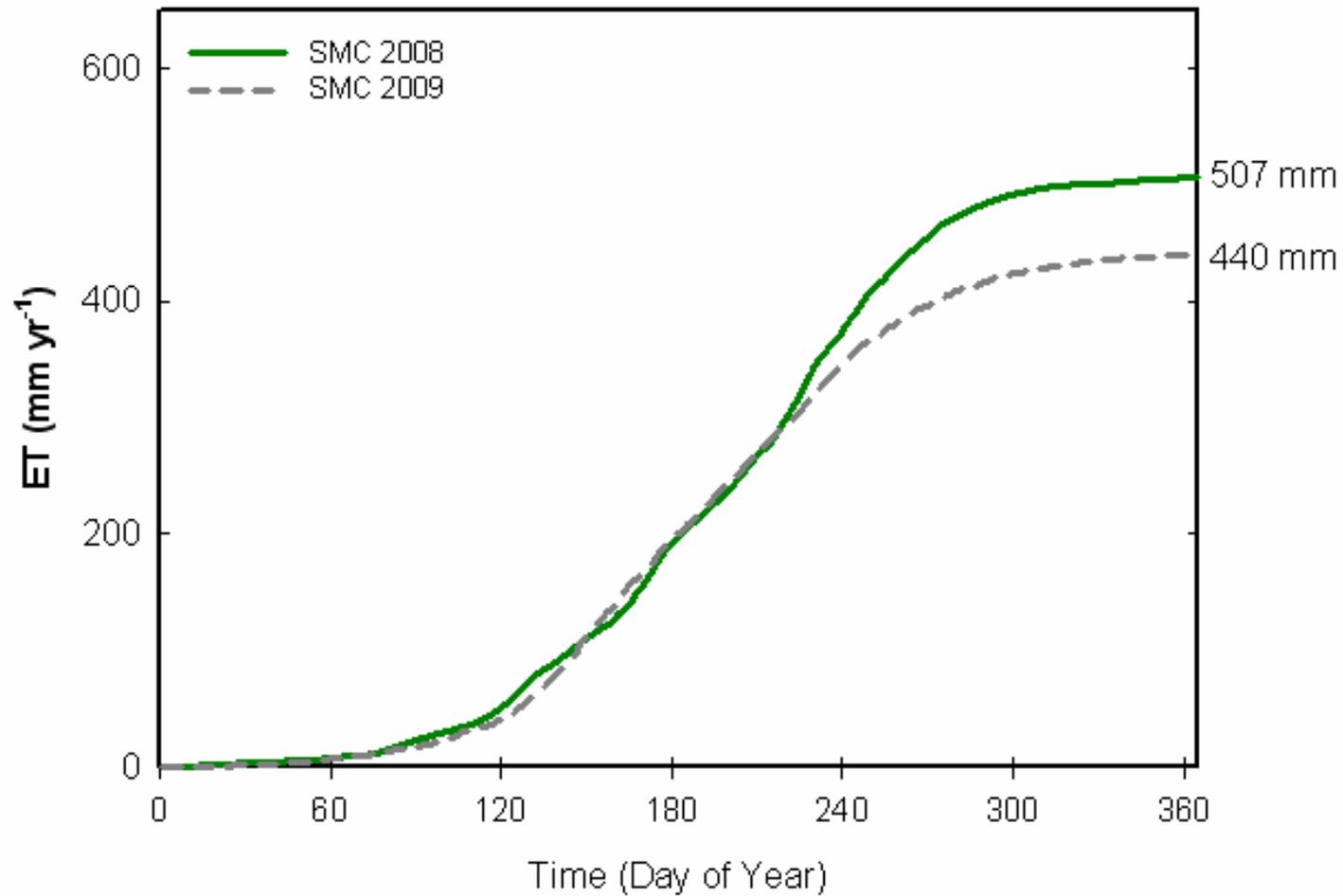
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- more frequent precipitation and a higher soil moisture in 2007 than 2008
- a higher ET rate in 2007 than 2008



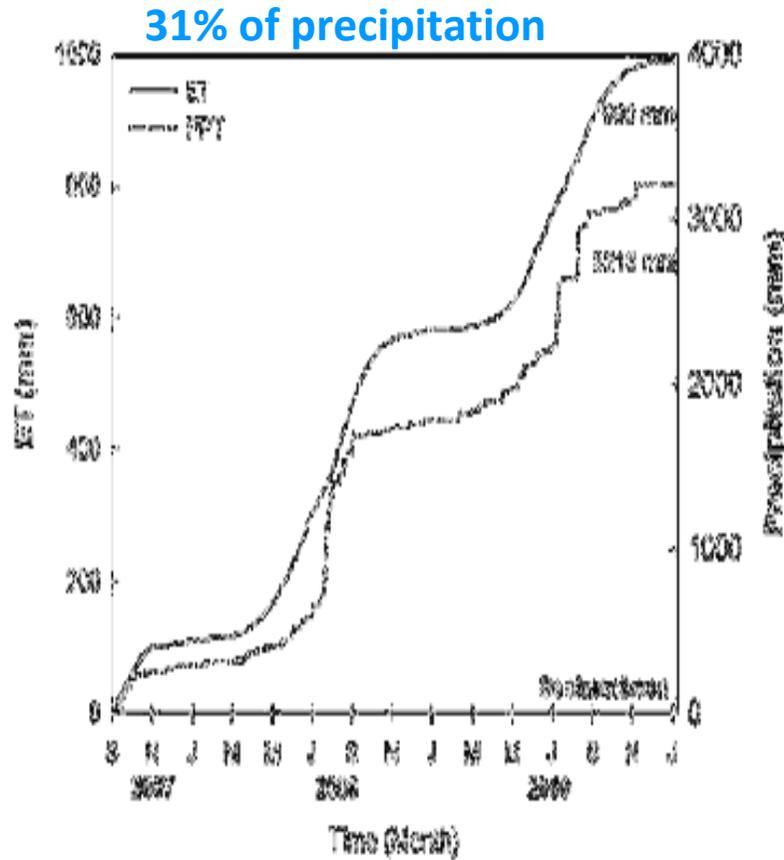
RESULTS : ANNUAL ET



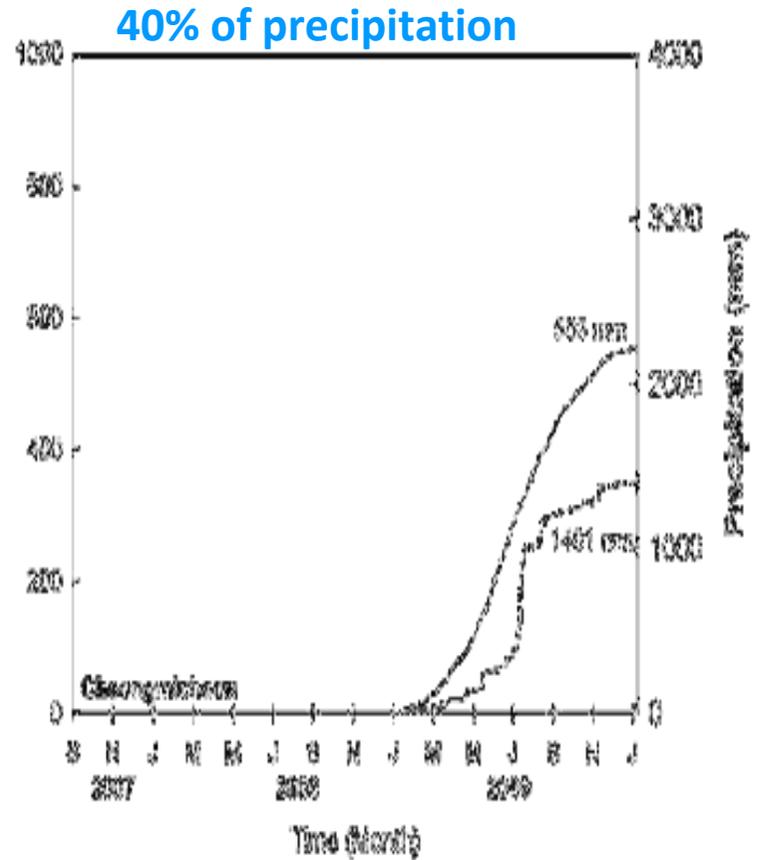
Annual Precipitation:

2008: 1458 mm / 2009: 1435 mm

RESULTS : ANNUAL ET

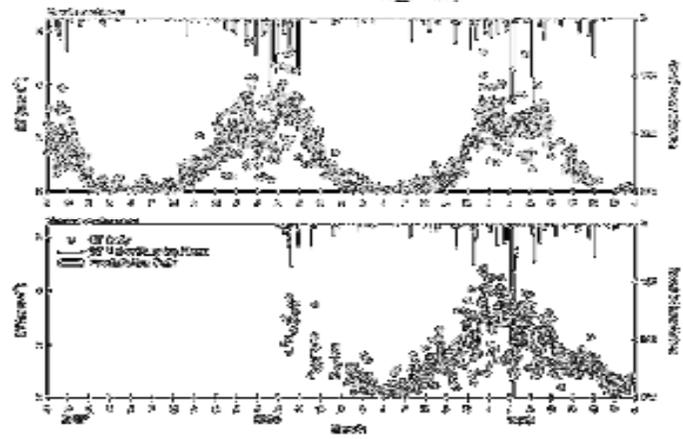
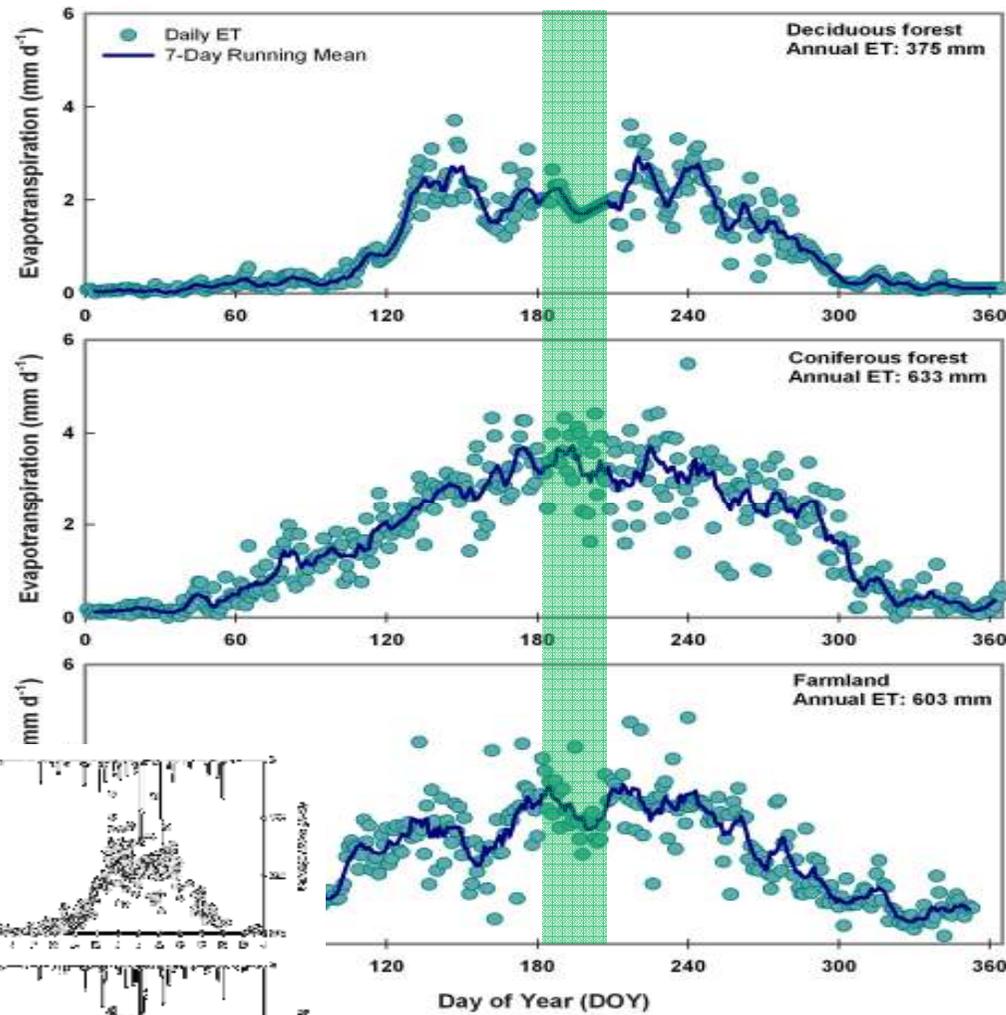


Annual ET
 2008: 507 mm
 2009: 440 mm



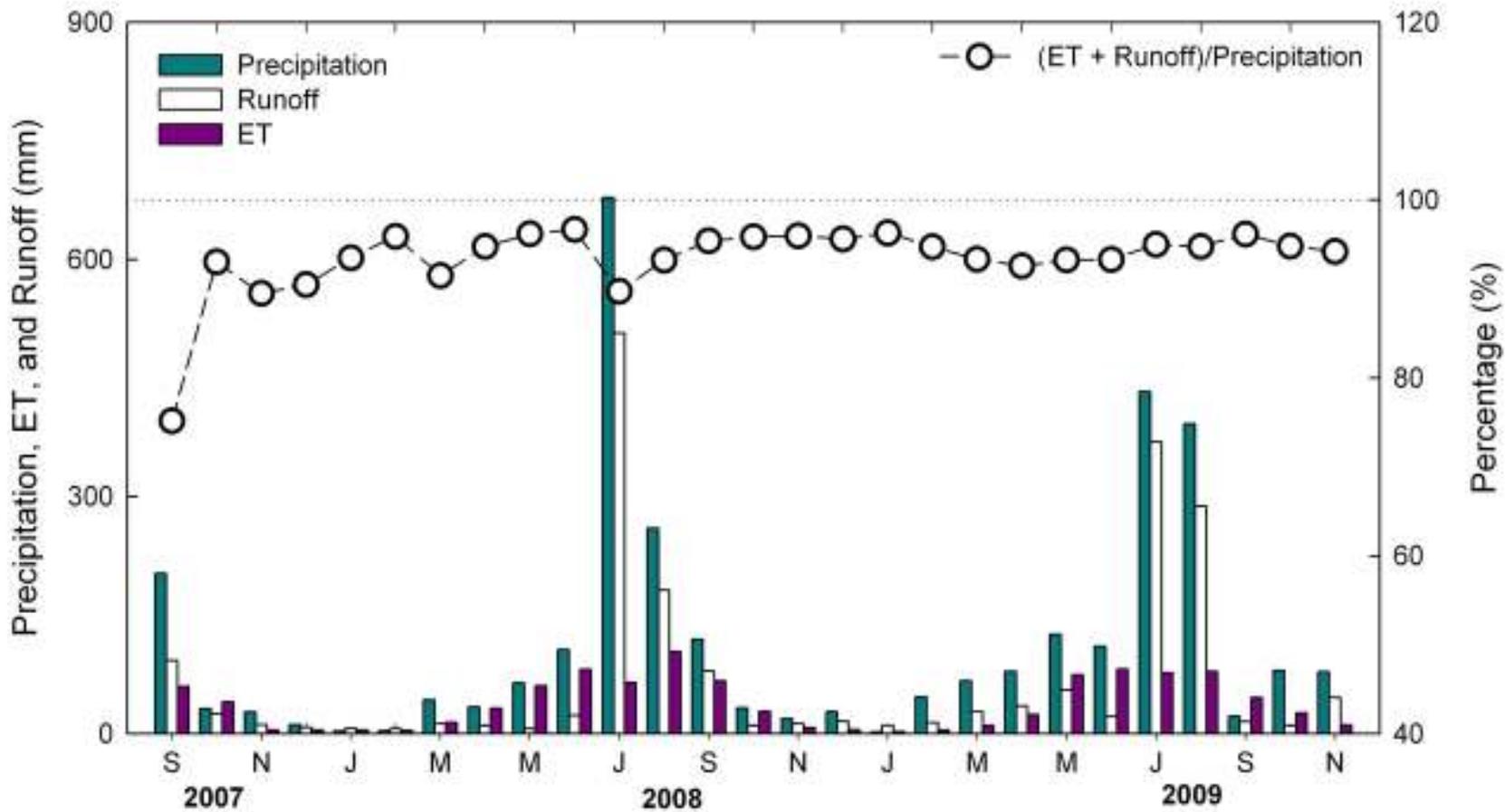
Annual ET
 2008: -
 2009: 553 mm

RESULTS : COMPARISON OF ET AMONG VARIOUS ECOSYSTEMS



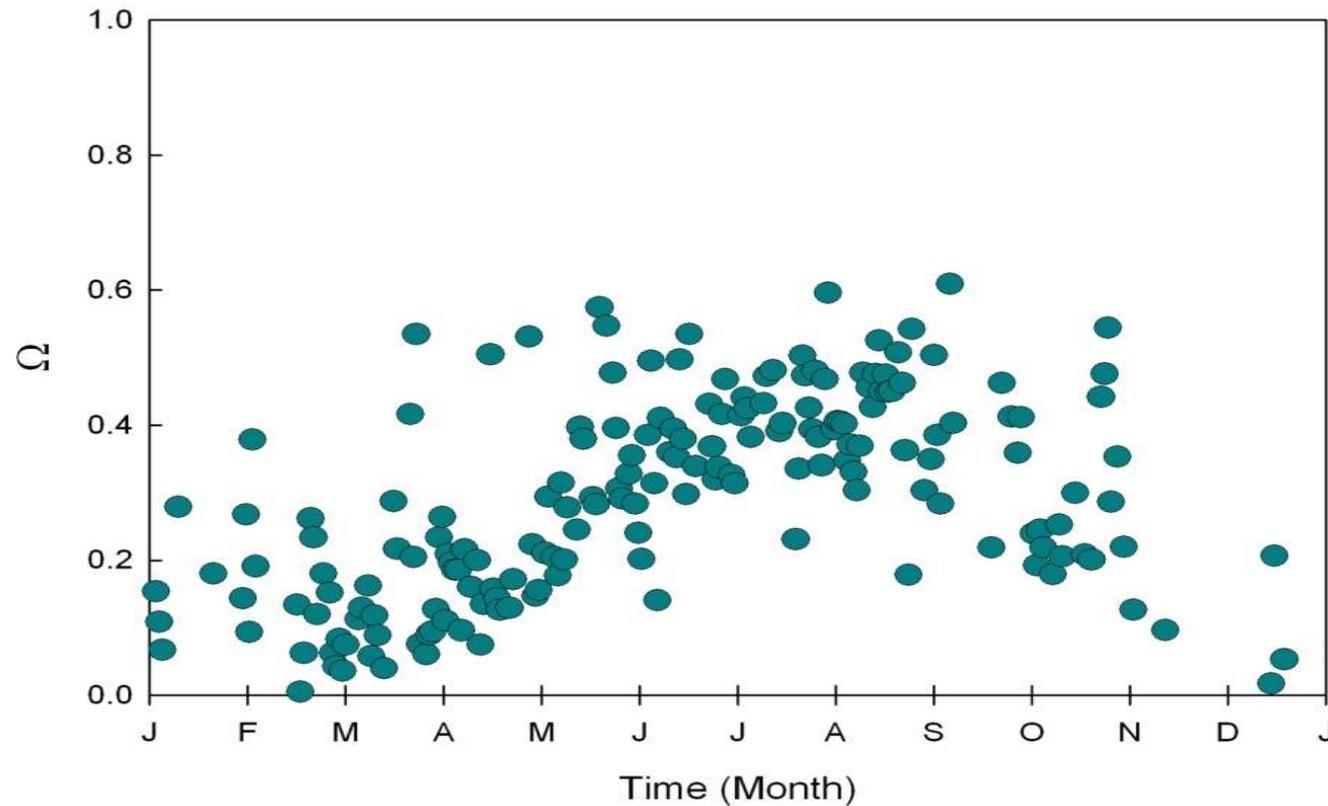
Source: Joon Kim (HydroKorea II)

RESULTS : WATER BUDGET



RESULTS : DECOUPLING FACTOR, Ω

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$$\lambda E = \Omega \lambda E_{eq} + (1 - \Omega) \lambda E_{imp}$$

λE_{eq} : equilibrium LE (available energy)

λE_{imp} : imposed LE (vapor pressure deficit, stomatal conductance)

- The annual ET varied 408 to 470 mm, which was about 31% of the annual rainfall at mixed forest site in Seolmacheon.
- The Seolmacheon site showed a characteristic seasonality with mid-season depression in ET that are associated with the reduced radiation.
- ET from the Seolmacheon site was equally contributed by equilibrium ET and imposed ET.