BANDO N. 400.15 IRPI PNRR

Selezione per titoli e colloquio ai sensi dell'art. 8 del "Disciplinare concernente le assunzioni di personale con contratto di lavoro a tempo determinato", per l'assunzione, ai sensi dell'art. 141 del CCNL del Comparto "Istruzione e Ricerca" 2019-2021, sottoscritto in data 18 gennaio 2024, di una unità di personale con profilo professionale di Ricercatore III livello, presso l'Istituto di Ricerca per la Protezione Idrogeologica Sede di Perugia (PG) progetto PNRR CUP B83C22003980006.

TRACCE ORALE del giorno 26 agosto 2024

DOMANDA GENERICA: Il candidato esponga la propria esperienza nell'ambito della tematica del bando.

DOMANDE PER LA VERIFICA DELL'INGLESE:

Busta 1

A snow depletion curve (SDC), the relationship between snow mass (e.g., snow depth [SD]) and fractional snow cover area (SCF), is essential to parameterize the effect of snowpack within a physically based snow model. Existing SDCs are constructed using traditional statistic methods may not be applicable in complex mountainous areas. In this study, we developed an information fusion framework to define the relationship between SCF and SD as well as 12 auxiliary factors by using a traditional statistical method and four prevailing machine learning (ML) algorithms

Busta 2

A surge of research efforts has been devoted to developing the conversion relationship between snow mass and snow distribution, and numerous SDCs based on traditional empirical statistical methods on the subgrid scale have been constructed. Numerous approaches, ranging from using simple fitting functions (Dutra et al., 2010; Wu & Wu, 2004) to more complex distribution functions with consideration of varying conditions, such as elevation, land cover type, and snow accumulation and ablation phases (Swenson & Lawrence, 2012; Zaitchik & Rodell, 2009), are commonly used. Among various SDCs, the most widely used SDC is to parameterize the SCF as a rational fraction function of grid cell mean SD and the ground roughness length that was used in the Biosphere-Atmosphere Transfer Scheme (BATS) (Dickinson et al., 1993).

Busta 3

In recent years, data-driven machine learning (ML) techniques have shown promising potential in SCF mapping. A variety of SCF nonlinear estimation models based on ML, such as multiple adaptive regression spline (MARS), artificial neural network (ANN), and support vector machine (SVM), have been established (Czyzowska-Wisniewski et al., 2015; Dobreva & Klein, 2011; Hou et al., 2020; Kuter et al., 2018; Moosavi et al., 2014). These results demonstrate that ML can easily introduce a variety of environmental information, such as surface reflectance, land cover, topographic information and meteorological conditions, constructing an information fusion framework that comprehensively considers multiple factors and significantly improves SCF mapping accuracy, especially in complex heterogeneous mountainous areas.

Il Presidente
(Prof.ssa Carla Saltalippi)

[redacted]

Il segretario
(Antonio Cirielli)

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