

CONCORSO PUBBLICO, PER ESAMI, A N. 1 POSTO DI CATEGORIA D, POSIZIONE ECONOMICA D1, AREA TECNICA, TECNICO-SCIENTIFICA ED ELABORAZIONE DATI, PER LE ESIGENZE DEL DIPARTIMENTO DI AGRARIA DELL'UNIVERSITA' DEGLI STUDI DI NAPOLI FEDERICO (COD. RIF. 2020) INDETTO CON DECRETO DEL DIRETTORE GENERALE N. 438 DEL 30.06.2020 E DEL QUALE E' STATO DATO AVVISO SULLA GAZZETTA UFFICIALE IV SERIE SPECIALE - CONCORSI ED ESAMI N. 53 DEL 10.07.2020

QUESITI NON ESTRATTI ALLA PROVA ORALE DEL 22 SETTEMBRE 2020 SUDDIVISI PER SCHEDA NON SORTEGGIATA

QUESITO SULLE ANALISI DI LABORATORIO E DI CAMPO PER LA DETERMINAZIONE DELLE PROPRIETA' IDRAULICHE DEL SUOLO

Determinazione della densità apparente dei suoli e della distribuzione granulometrica del suolo

QUESITO SULLE TECNICHE DI MONITORAGGIO DI VARIABILI AGRO-AMBIENTALI

Misura in campo del potenziale idrico dei suoli.

QUESITO SUL BILANCIO IDROLOGICO E IDROGEOLOGICO

Valutazione dei processi erosivi

QUESITO SULLA SALVAGUARDIA DELL'AMBIENTE E DEGLI ECOSISTEMI AGRO-FORESTALI NONCHE' ALLA GESTIONE TECNICA DI UN PROGRAMMA DI RICERCA

Organizzazione delle diverse attività per la raccolta di dati in un campo sperimentale

QUESITO VOLTO AD ACCERTARE LA CONOSCENZA DELL'USO DELLE APPARECCHIATURE E DELLE APPLICAZIONI INFORMATICHE PIU' DIFFUSE CON PARTICOLARE RIFERIMENTO AI SOFTWARE APPLICATIVI DELLA SUITE MS OFFICE (WORD, EXCEL, POWERPOINT) E DEI SISTEMI OPERATIVI WINDOWS, DI SOFTWARE GIS E DI ANALISI DI IMMAGINI E ORTO FOTO PER ESTRARRE DATI AMBIENTALI E INFORMAZIONI QUANTITATIVE

Georeferenziazione di un'ortofoto in ambiente GIS

TESTO BREVE IN LINGUA INGLESE DA LEGGERE E TRADURRE VOLTO AD ACCERTARNE IL GRADO DI CONOSCENZA

3.



BOX 4.4 The Uses of Clay

Some eight millennia ago, humans discovered the use of clay for pottery-making. No material extracted from the earth is put to a wider variety of uses, and no material except flint has been used longer. One of the most important uses of clay in antiquity was for writing. Clay tablets were fashioned, then—while still in the moist state—imprinted by means of a sharp reed stylus. If fired subsequently, such tablets (though brittle) could become permanent records of political and commercial deeds, as well as of legal and religious codes, myths, and poetry.

Even in modern times the most numerous applications of clay are in ceramics. The value of clay for this purpose arises from its plasticity and the fact that it becomes hard when it is fired. Hence it can be shaped easily, and the desired shape can be made durable, mechanically strong, thermally and electrically resistant, and either pervious or impervious.

At first, ceramic objects were made of illite-rich clay, because the temperature required for "firing" this clay is rather low. In time, people discovered ways to build furnaces (kilns) capable of sustaining higher temperatures. When the temperature is high enough, the clay particles tend to fuse. Wall tiles, ceramic pipes, and stoneware pots are among the objects made in this way. Sanitary faïences are made with kaolinite fired at very high temperatures. When the kaolinite is quite pure and fusing is complete, a translucent glass is obtained, called *porcelain*, which is used for the manufacture of fine chinaware as well as of electric insulators.

A traditional use of clay is in construction. Even today, an estimated third of all humans live in houses made of clay. Clay mixed with sand or straw constitutes a plaster-like material called *daub*. Packed into molds and then dried, it is made into mudbricks. When fired, it is hardened into stonelike bricks. Cement is a mixture of limestone and clay (about 25% clay) fired at a temperature of 1400° C. The silica and alumina of the clay generate calcium silicate and aluminates, which on being mixed with water yield the entangled and resistant crystallites characteristic of hardened cement.

In antiquity, cisterns and channels were coated with clay so they would hold and convey water with minimum leakage. Injection of clayey mud is a common practice in drilling for oil. Pumped constantly into a drill pipe, the mud cools the drill bit and then rises along the pipe, carrying away the drill cuttings.

Another engineering application relies on the properties of vermiculite. When this mineral is heated, water in its crystal structure is driven out. The mineral then twists like a worm, expands, and becomes highly porous. When mixed with cement, it forms a lightweight concrete. Vermiculite is also used as a thermal or sound insulator in the walls of buildings and ships.

The finest grained clays (fuller's earth) have long been employed for cleaning clothes. In Morocco, people still clean clothes with *ghasul*, which is a clay containing natural stevensite. In Europe during World War II, soaps were made with a high content of montmorillonite. The adsorptive properties of clay are commonly utilized for purifying water, decolorizing mineral oils, and filtering beer, wine, and syrup. Clays that have been calcined (heated to drive off volatile matter) or treated with acid become highly active and are used as catalysts in many industrial processes. The huge surface area of their flakes speeds such industrial chemical reactions as cracking, oxidation, and synthesis. The ability of smectite clays to form stable colloidal suspensions is useful in the preparation of polishes, cosmetics, and pesticides, among many products.

QUESITO SULLE ANALISI DI LABORATORIO EDI CAMPO PER LA DETERMINAZIONE DELLE PROPRIETA' IDRAULICHE DEL SUOLO

Tecniche di misura della conducibilità idraulica dei suoli in condizioni di saturazione

QUESITO SULLE TECNICHE DI MONITORAGGIO DI VARIABILI AGRO-AMBIENTALI

Tecniche per il campionamento indisturbato di suoli.

QUESITO SUL BILANCIO IDROLOGICO E IDROGEOLOGICO

Valutazione del bilancio idrologico di un piccolo bacino

QUESITO SULLA SALVAGUARDIA DELL'AMBIENTE E DEGLI ECOSISTEMI AGRO-FORESTALI NONCHÉ ALLA GESTIONE TECNICA DI UN PROGRAMMA DI RICERCA

Valutazione della stabilità dei versanti e indicazione tecniche di protezione

QUESITO VOLTO AD ACCERTARE LA CONOSCENZA DELL'USO DELLE APPARECCHIATURE E DELLE APPLICAZIONI INFORMATICHE PIU' DIFFUSE CON PARTICOLARE RIFERIMENTO AI SOFTWARE APPLICATIVI DELLA SUITE MS OFFICE (WORD, EXCEL, POWERPONT E DEI SISTEMI OPERATIVI WINDOWS, DI SOFTWARE GIS E DI ANALISI DI IMMAGINI E ORTOFOTO PER ESTRARRE DATI AMBIENTALI E INFORMAZIONI QUANTITATIVE

Principali tipologie di dati nei sistemi GIS

TESTO BREVE IN LINGUA INGLESE DA LEGGERE E TRADURRE VOLTO AD ACCERTARNE IL GRADO DI CONOSCENZA

2.



BOX 1.2 The Representative Elementary Volume Concept

Some soil properties (for example, temperature) can be measured at a point, whereas other properties are volume dependent. Suppose we wish to measure some volume-dependent soil property, such as porosity. If our sample is very small—say, the size of a single particle or pore—the measured porosity may vary between 0 and 100%, depending on the exact location of our measurement (whether at a particle or at a pore). If we measure the porosity repeatedly at several adjacent points, the results will fluctuate widely. However, if we increase the scale or volume of each sample so as to encompass within it both particles and pores, the fluctuations among repeated measurements of adjacent locations will diminish. If we keep enlarging the sample gradually, we will eventually obtain a consistent measurement of the soil's average porosity. The minimal volume of sample needed to obtain a consistent value of a measured parameter has been called the representative elementary volume (REV) (Bear, 1969, 1972). Obviously, the REV tends to be larger in soils that are strongly aggregated and in soils that are stony, cracked, or otherwise heterogeneous than in more uniform soils.

The problem with the REV concept is that different parameters may exhibit different spatial or temporal patterns, so that the REV for one parameter or property may differ from those for other parameters. That is to say, each property may have its own characteristic scale. Even more serious may be the failure of the REV concept in the case of "structured" fields, that is, in fields that vary systematically in one direction or another. In such fields, increasing the size of the sample measured may not produce a consistent value at all.

Per ordine del Presidente

Il segretario

f.to Nicola Gianniello