Early warning system: Ensembles probabilistic forecasts for community level applications

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Early warning is a key element for disaster risk reduction. However, the advances in generating hazard risk information have not yet been incorporated into operational forecast systems and consequently, operational forecasts have not been integrated into decision making processes in order to reduce disaster risks. This article aims to design location-specific user-need based flood forecast products and its application on different time scales for reducing flood risks. Using one to ten days multiple weather ensembles (EPS) forecasts of the European Centre for Medium Range Forecasts (ECMWF), integrating hydrological models, and combining these with GIS and local user needs. The decision support system (DSS) is designed to interpret, translate, and communicate science-based risk information into user-friendly early warning information products to assist emergency managers and decision makers. The DSS interface allows users to interactively specify the objectives and criteria that are germane to a particular situation, and obtain the management options (strategies) that are possible, and the exogenous influences (scenarios) that should be taken into account before policy planning and decision making. The proposed framework is applied to a pilot area in the Brahmaputra river basin in Bangladesh for the agricultural sector.

Conclusion
The Decision Support System for an early warning of an impending flood is useful and helps the community interpret and translate scientific information into risk information. The usage of increased understanding of probabilistic long lead flood forecasting is valuable for society and for the protection of agriculture in flood-prone areas. In order to receive value-added benefits from flood information, requirements of different users should be considered very carefully and ment sensibly. The 2011 flood information was delivered to the community and found beneficial for decision making. Accuracy and the lead time of the forecast are very important for the community to establish confidence in the practical utilization of probabilistic information. The integrated flood forecasting DSS for risk management has generated greater interest in people living in the study area. Flood forecast should be more specific so that the forecast will match the real situation more accurately.

Analysis of electrical-acoustic tortuosity of equivalent dual porosity media and its application on elastic parameters

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The evaluation of pore structure is an important task of oil&gas exploration and petrophysical research. The tortuosity is an key parameter for pore structure, whereas in different area have different meaning and definition. To investigate the relationship between the electrical tortuosity and acoustic tortuosity of the complex rock pore structure of porous media, the theory of equivalent dual porosity media that the rock can be equivalent to the cylindrical dual-porosity model is proposed and subsequently the electrical tortuosity and electrical parameters are obtained by means of macroscopic Ohms law. The relationship between electrical tortuosity and acoustic tortuosity which is obtained by means of solving one-dimensional wave equation based on the linear Euler formula is researched. Moreover, the effect of porosity and different pore components on the rock tortuosity is studied and the relation among tortuosity, bulk modulus and shear modulus is further analyzed by experiment. The research showed that both the lectrical tortuosity and the acoustic tortuosity are equivalent, which can reflect the pore structure. The tortuosity is mainly controlled by the pore structure but not the porosity. The tortuosity decreases sharply with the increase of the ratio of pore component when the ratio of pore component is small than 2, whereas changes slowly if the ratio of the pore component is large than 2. Besides, the tortuosity has good linear relation with elastic parameters, such as bulk modulus and shear modulus. Therefore, the rock elastic parameters can be obtained by inversion of tortuosity.

Biography
GE Xin-min got his master degree in 2007 from China University of Petroleum and is now a PhD candidate of China University of Petroleum. His main research area related to well logging data analysis, formation evaluation and petrophysics experiment.