EDITORIAL

The First ISLSCP Field Experiment

The First ISLSCP Field Experiment (FIFE) has produced a wealth of scientific results associated with land–atmosphere interactions and the use of remotely sensed measurements to study interactions at the land–atmosphere interface. This special issue of the *Journal of the Atmospheric Sciences* consists of 13 papers investigating various subjects from surface forcing of planetary boundary layer circulations, surface flux modeling-parameterization–retrieval methods, biotic effects on boundary layer processes, remote sensing of surface properties, and the FIFE data itself. Publication of this volume places the number of FIFE-related refereed publications well over the 250 mark. This is a remarkable achievement considering that the scientific problems intrinsic to FIFE and more recent similar experiments such as HAPEX Sahel, BOREAS, and LBA-Amazon are interdisciplinary in nature, and have only entrained dozens of scientists as opposed to the hundreds that such experiments as GATE and TOGA COARE were able to captivate. In this regard, FIFE has helped mold a new discipline analogous to air–sea interactions, a discipline referred to as land–atmosphere interactions, and embodying numerous scientific problems whose roots are found in the subject areas of micrometeorology, terrestrial ecology, atmospheric boundary layer meteorology, ground hydrology, soil physics, and trace gas exchange chemistry. For this we owe our thanks to those that helped inspire FIFE and kept it focused on interdisciplinary problems that do not have obvious or easy solutions. In this regard Piers Sellers, Forrest Hall, Diane Wickland, Bob Murphy, and Tom Schmugge deserve much of the credit.

As with studies of air–sea interactions, the ultimate issue with land–atmosphere interactions concerns the nature of surface fluxes, that is, fluxes of heat, radiation, moisture, momentum, and trace gases such as carbon dioxide, the nitrogen compounds, and methane. The scope of research involves measuring fluxes; retrieving fluxes through remotely sensed measurements; modeling fluxes; diagnosing their hehavior from either a biological perspective or a turbulence perspective; determining how surface fluxes impact boundary layer circulations, growth, chemistry, and cloudiness; and generally seeking more realistic ways to formulate surface interface process models to improve surface flux prediction and thus the prediction of weather and climate.

The stimulus for this special issue came from the now-departed Tzvi Gal-Chen, who was a member of the FIFE Science Team and was one of the co-chief editors of *JAS* at the time of his death. As those who knew him understood, Tzvi was a remarkable man and an excellent scientist, qualities which I will not expound on here but simply mention that the AMS Council and the *JAS* editors have already produced a *JAS* volume in recognition of Tzvi and his outstanding talents (1996; Vol. 53, No. 18).

What needs to be said here is that Tzvi wanted a special issue devoted to FIFE with a focus on boundary layer response to heterogeneous surface processes. At the time, he asked me to assist him as one of the corresponding *JAS* editors, a request to which I agreed. After his death, I mulled over the idea of proceeding with the special issue, recognizing that I could not cultivate the full extent of what Tzvi had in mind and wondering whether it would be wise to proceed without him. Furthermore, Tzvi had been working on various papers he intended for the special issue concerning the nature of countergradient momentum transports in a convectively forced boundary layer, papers that to our misfortune will likely never materialize. Nevertheless, whenever we had discussed the project, one of his emphatic points was that the *JAS* readership needed to be exposed to the type of interdisciplinary work that was coming out of FIFE and would be coming out of the future land–atmosphere experiments, and that this subject

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had to become part and parlance of the atmospheric science mainstream because of its relevance to boundary layer processes.

With that in mind, and after deliberating over a year, I finally proceeded by organizing a final FIFE symposium at the 1996 Annual Meeting of the American Meteorological Society in Atlanta and requested papers from a number of specialists who where still active in FIFE concerning research issues pertinent to the planetary boundary layer. What became of that meeting is this volume of papers, which on behalf of my FIFE colleagues and myself, we dedicate to Professor Tzvi Gal-Chen because he was a special friend and a great scientist. Although this volume may not be exactly what Tzvi had in mind, the readers of this volume should recognize that there are some important papers in this collection and that, in addition to exhibiting the work of some new, younger, accomplished scientists such as Behzad Abereshi, Michael Bosilovitch, Daoyi Chen, Greg Collelo, Joe Eastman, Thomas Hopson, and Christa Peters-Lidard, there are also a number of other more senior authors represented in these papers who were responsible for many of the major scientific achievements of FIFE. I extend my personal acknowledgments to all of them for helping make this special issue possible.

I also wish to note the passing of Dr. Cyril Grivet during the course of this project. Cyril, who was a contributor to this volume and a coauthor on the paper from the Carnegie Institute (Collelo et al.), was among those lost in the tragic crash of TWA flight 800 on 17 July 1996. All of us involved in this project extend our condolences to his family, friends, and colleagues who miss his gifted ways.

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