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In this commentary I will be discussing the acquisition and transfer of scientific information. As I perceive it, those tasks are the principal business of all of us attending this symposium. I have come to the conclusion based on my review of Theme 3 papers, that many of us are not fulfilling our obligations as scientists as adequately as we ought to when we set about to acquire new information and report it to our peers.

In his keynote address for Theme 1 Painter summarized the interest of land managers as being able to assess, understand, and control erosional processes. Certainly, any investigation includes some assessment and attempts at understanding. Most investigations, further, have the ability to control as their ultimate objective. Having said that, I would claim that Theme 3 papers and the types of investigations hey represent, are aimed primarily at assessment. That being the case, the authors in this section have a major responsibility for providing ground truth for those attempting to understand and control erosional processes.

The importance of the assessment role was highlighted by both Pickup (Theme 2) and Swanson (Theme 3) in their keynote addresses. Pickup said that we need more case studies. Taking a slightly different tack, Swanson expressed the need for a "natural history" approach to our investigations. He asserted that we need to de-emphasize narrowly focused investigations and emphasize those which, at a minimum, completely treat all of the various aspects of a major component of the sediment budget of the area under investigation. Collectively, their admonitions suggest that we don't understand the phenomena we are studying very well and must, therefore, conduct extensive investigations if we are to acquire some understanding of the movement of sediment in natural and man-disturbed systems.

My feeling that all was not well with how we're going about acquiring new information was seconded by several speakers earlier in our program. Beschta, commenting on Theme 2 papers, said that we need to be more careful in defining the objectives of our investigations. It is hard to know what you have found out if you don't know what you are trying to find out. Pickup urged us to be sure that we make our measurements at the relevant place. I would further urge that we also be sure that our measurements, themselves, are relevant. Too often we use surrogates for the measurements that we ought to be making and

then blithely assume into nonexistence the problems that may have been created by the noncongruence of the surrogates with relevant measure ment taken at the relevant place. Dissatisfaction with the current state of affairs was seconded by Sutherland when he asked: "Have we really learned much from all the field investigations?" I guess I would have to disagree with the implied answer to Sutherland's query. I think we have learned quite a lot, but I think we could have learned a lot more had we heeded the Pickups and Painters among our peers.

It is not fair for me, or others, to merely assert that we're not doing very well and leave it at that. We ought to attempt to identify the source of our difficulties and at least suggest some remedial actions which we might take. Fundamentally, I believe that many of our problems stem from the fact that watershed management is coming of age around the Pacific Rim. Consequently, land managers are now asking for the answers to hydrologic and sedimentologic questions. This condition might be quite favorable if it were not for the fact that most managers have an inflated view of the state of our science and art. That deficiency would not be too serious were it not for the fact that many of us lack the courage to correct this misconception. We appreciate the attention that managers are currently giving to our views after so many years of indifference. We can't bring ourselves to inform them that we cannot walk on water - even at 500,000 milligrams per litre. As a result, we find ourselves conducting ill-defined investigations which arrive at weakly supported conclusions in an unrealistically short period of time.

As a remedy, I would suggest that we start being more hardnosed about tasks we will undertake and the price we are willing to accept. Our clients should be made to understand the relationship between the time and resources devoted to an investigation and the quality of the information produced. We need to be very exact when we explain to them what we can and cannot do. Part of that explanation ought to be some definition of a "successful" completion of the task and an estimate of the probability of success. Due to the vagaries of nature, especially climatic variability, many of the investigations we undertake carry a low probability of reaching a completely successful conclusion. This fact ought to be driven home before studies are undertaken on behalf of others.

Until now I've been discussing the acquisition of scientific knowledge. Such knowledge, however, obtains most of its value when it is transmitted to others. What are the problems and possible solutions to them? This question is perhaps more difficult to answer. Often it is hard to distinguish poor science from poor communication. I will assume that I am dealing with poor communication.

One source of the difficulty lies, I believe, with our publishers. All of us chafed under the page limitations applied to the proceedings of this Symposium. I would maintain that much of what we do is ill-suited to reporting by means of short articles. Certainly, it would be unwise for Fred Swanson to attempt to describe one of his "natural history" studies in a brief article. In this regard, some of the Theme 3 papers sounded better when presented here. The authors filled in the gaps and

explained away many of the ambiguities in the Proceedings. For those of us here, that was an adequate solution to the problem - what about all of those who could not come to Christchurch and will only gain their impressions of the research reported here by reading the Proceedings?

Page limitations are not the sole explanation. We must share the blame. In our desire to appear omniscient we find it difficult, especially in print, to resist the temptation to put the best possible face on what we have done. We are reluctant to own up to the random perturbations that degrade most of our research. In Theme 3, only Nolan and Janda acknowledged the political pressures which led to some of the compromises which blemished their investigation. I believe I can perceive similar skeletons in many of our closets. And they went unnoticed in our papers.

There are several steps that we can take to remedy our communication difficulties. Many of us play roles in various professional societies. Let us attempt to get them to review the appropriateness of their publication policies. There will, however, always be some limits. The world is never going to be enthralled with all we have to say. Therefore, it is incumbent on us to adjust our report to the medium which we are using to transmit the information. In this way, what we have done can be adequately understood by our readers. Let us be willing to rewrite our articles or postpone a publication if we cannot accomplish this.

Both in the planning and in the reporting of our research, let us define both precision and accuracy to the best of our abilities. Lastly, let us clearly distinguish between scientific inferences and our professional opinions. If we will take these steps and others which I have urged earlier, I am confident we will become members of a more vigorous and productive scientific community.