Methods

General

Biologists are sensitive to the need for encouraging advanced and imaginative techniques; yet comparability of results will be enhanced by inter-calibrations, standardization of measurements, and faster communication. Three types of publications will elaborate the possibilities for and limitations of techniques:

(1) published books of general reference value,

(2) handbooks of the international sections of IBP, and

(3) supplementary reports of the U. S. national committee on new techniques.

For intensive total-system studies, measurements will be made to all major components of the ecosystem. Measurements should include gross production, respiration, net production, secondary and tertiary production, rates of decomposition, exchange of matter with contiguous systems, soil and topographic settings, and microclimatic and macroclimatic variables. Energy flow, nutrient cycling, and production will be investigated on a seasonal basis. Spatial and temporal variation in selected populations should be given special attention.

Examples of techniques for the above measurement include the use of isotopes for tracing food chains and estimating rates of nutrient cycling; remote sensing with such tools as aerial photography, infrared scanning, radar, sonar, and underwater TV; biotelemetry; laboratory microecosystems; and physical and chemical methods, such as chromatographic techniques, nuclear magnetic resonance, atomic absorption, activation analysis, spectrophotometry, calorimetry, nitrogen analyzers, and respiration chambers with automatic gas analyzers. Contributing studies could involve one, several, or many of the these techniques at locations other than those chosen for intensive study.