

# Research Trends and Results

## Preparation of Sediment Balance Map by Grain Size Group for Promotion of Comprehensive Sediment Management

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### 1. Importance of organization of basic information for comprehensive sediment management

Comprehensive sediment management means to take drastic measures that connect different areas from a viewpoint of "sediment transport system," i.e., a group of areas connected in terms of sediment transfer, by removing the limitation of area-specific measures, such as for mountains, river channels, and coastal areas with regard to sediment-related issues including disaster prevention and environmental conservation. This concept was proposed a long time ago but is not yet established in the practice of river management.

One reason for that is that it takes much time to collect and organize the data from previous surveys and analyses, and identify sediment movement for the scale of a sediment transport system that is based comprehensive sediment management. The circumstances giving rise to such reason are as follows.

1) Record periods, resolutions (spatial / temporal observation intervals, data acquisition methods, etc.), and quality (e.g. planned value or actual value) of the observations and other data are not unified mainly because different entities performed projects in different areas, and the scale and location of projects changed according to social, economic, or other situations.

2) Under such constraints, it requires experience to organize and analyze data with an approach to identifying the relevance between each issue and sediment movement according on the scale of a sediment transport system.

Therefore, we decided to collect relevant data in a retrospective and comprehensive manner, and create a sediment balance map that reflects the status of sediment transfer in mountainous area (including dams) and coastal areas based on the sediment balance of river channels connected to those areas in the 109 river systems managed by the country.

### 2. Preparation of sediment balance map by grain size group as basic information

A sediment balance map indicates dam sedimentation, branch river sedimentation, transfer of sediment from the river channel in river development or maintenance, gravel extraction, increase in channel volume calculated from changes in river channel shape, and sediment yield estimated from geology, etc. Each of these quantities is classified according to grain size groups (gravel, sand, silt / clay) and indicated as an annual average value. When the color of a bar indicating the amount is "red," it means increasing transfer from mountain to river channel or from river channel to coast, and when "blue," it means

decreasing for the same. Accordingly, for example, in mountainous area (including branch rivers), the amount of transfer to a river channel is obtained by deducting the amount of "blue" from "red."

With this method, it is possible to grasp the relations between sediment balance in a river channel and the amount of transfer between areas. In the figure, for gravel, gravel extraction from the river channel is estimated to have a greater effect on degradation of the riverbed compared with dam sedimentation. Furthermore, for sand and silt / clay, gravel extraction from the river channel has little effect and dam sedimentation is estimated to have a direct effect on the amount of transfer to coastal areas.

In the future, we plan to prepare sediment balance maps for each of the 109 river systems with analyses similar to above and utilize them for promoting comprehensive sediment management for each river.

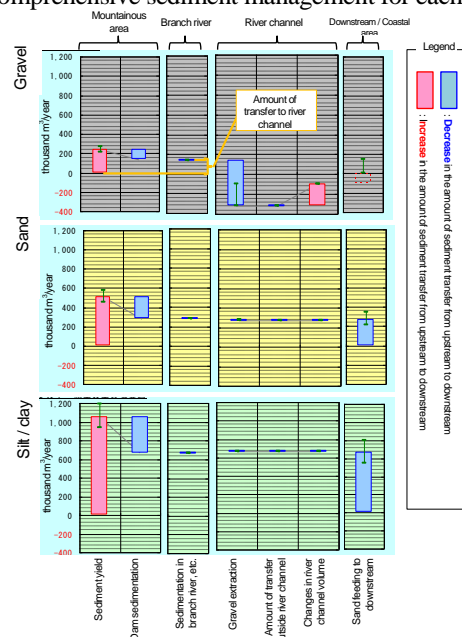


Fig.: Example of Sediment Balance Map by Grain Size Group