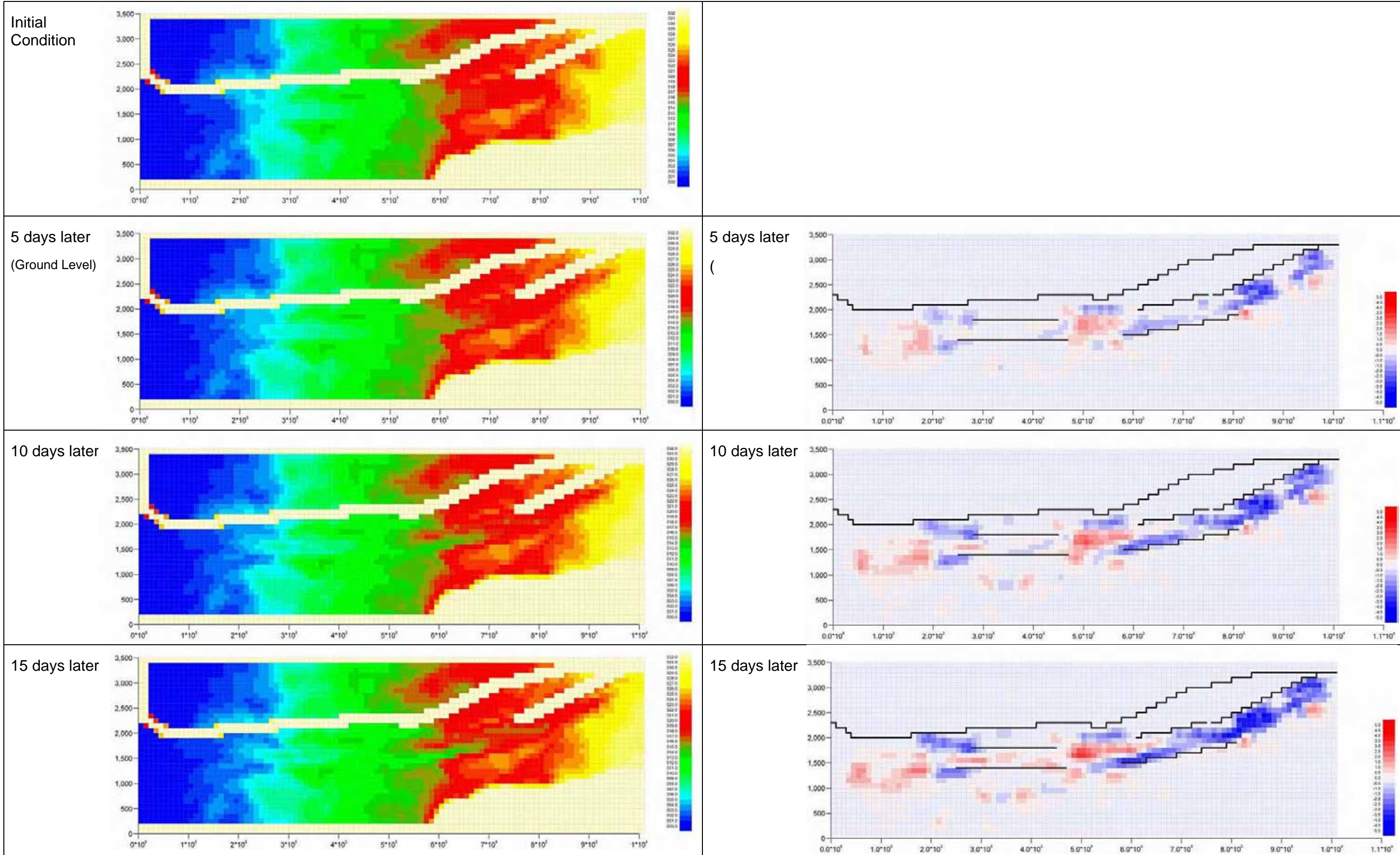
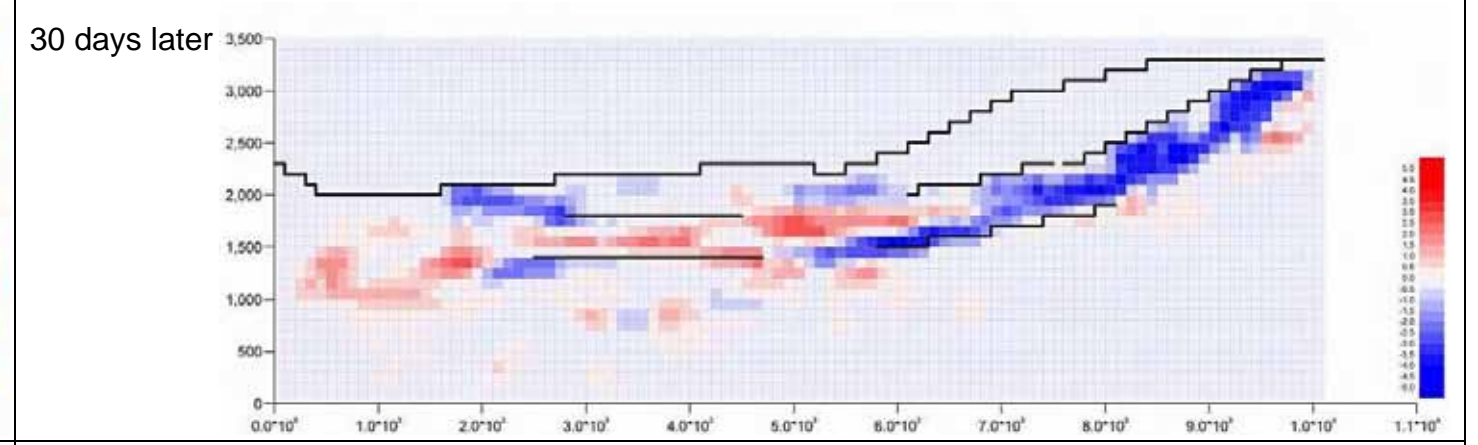
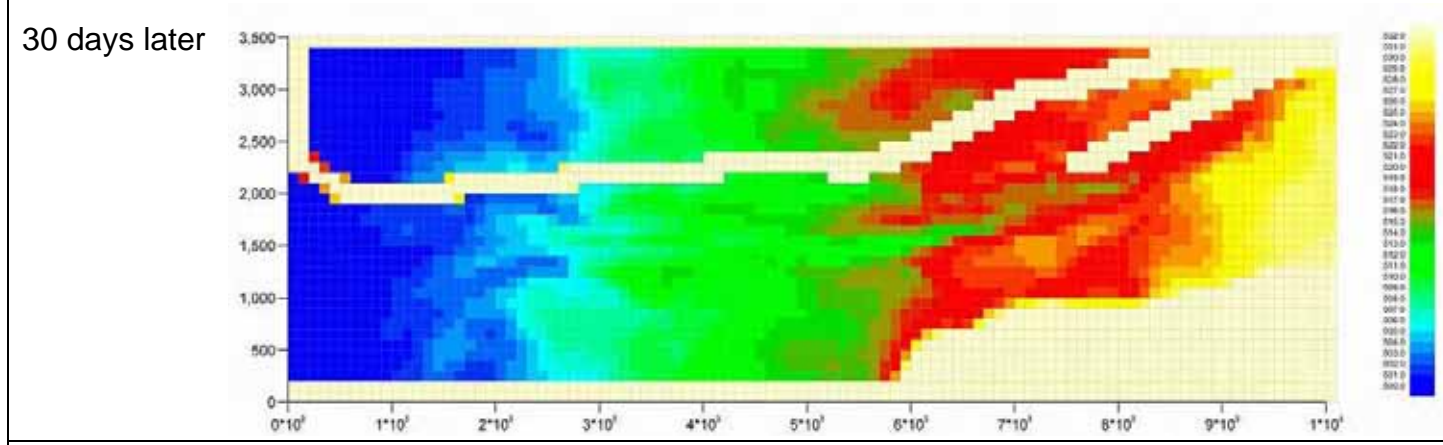
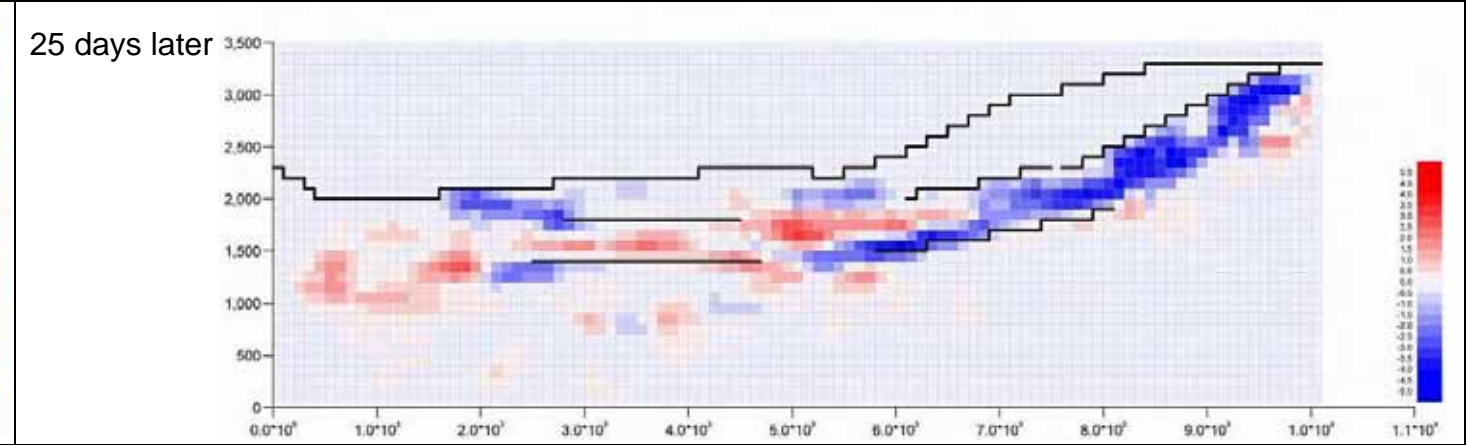
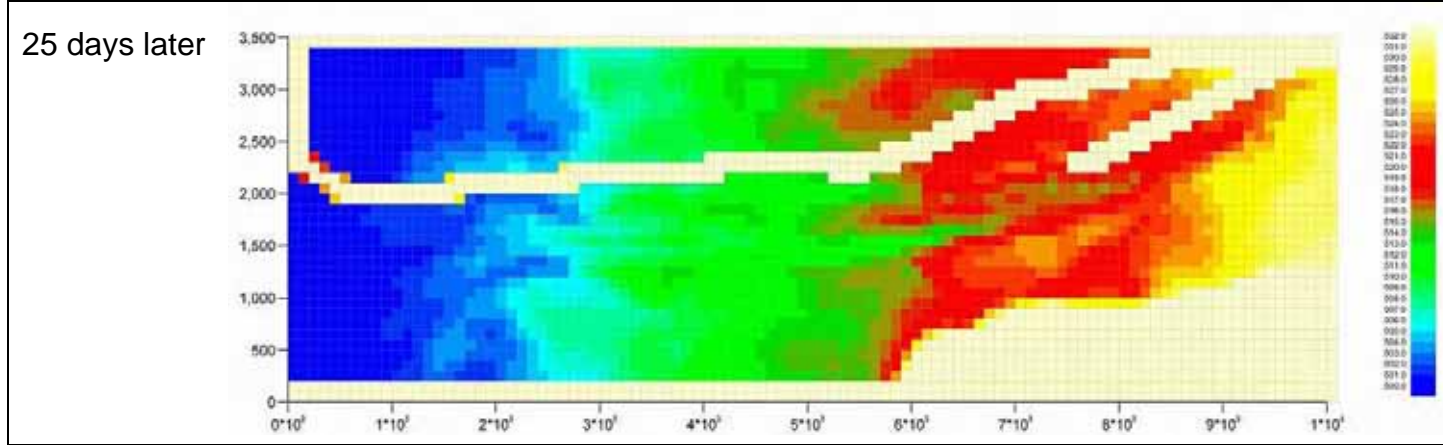
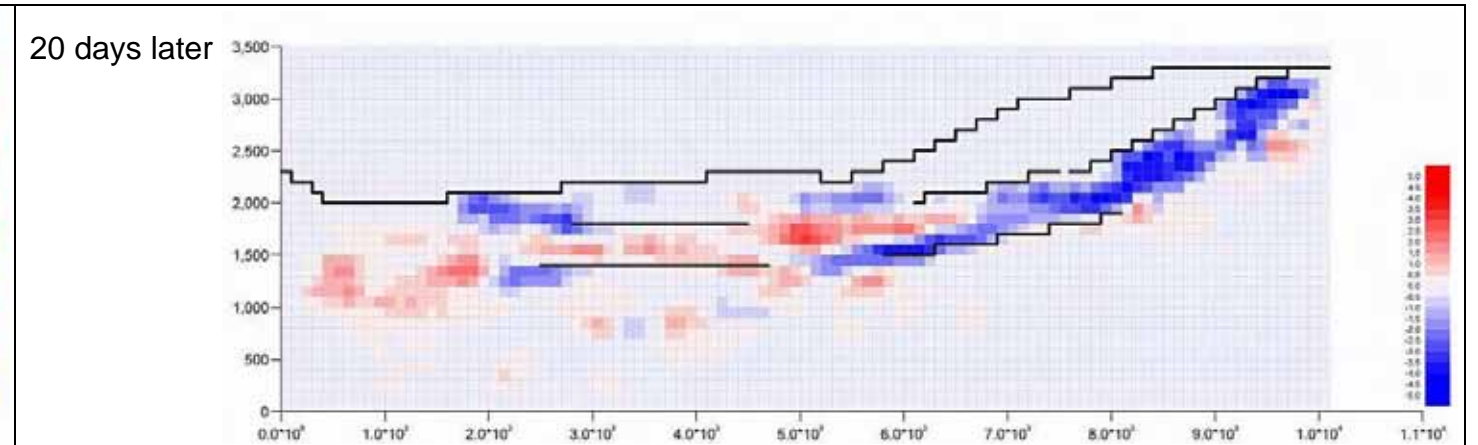
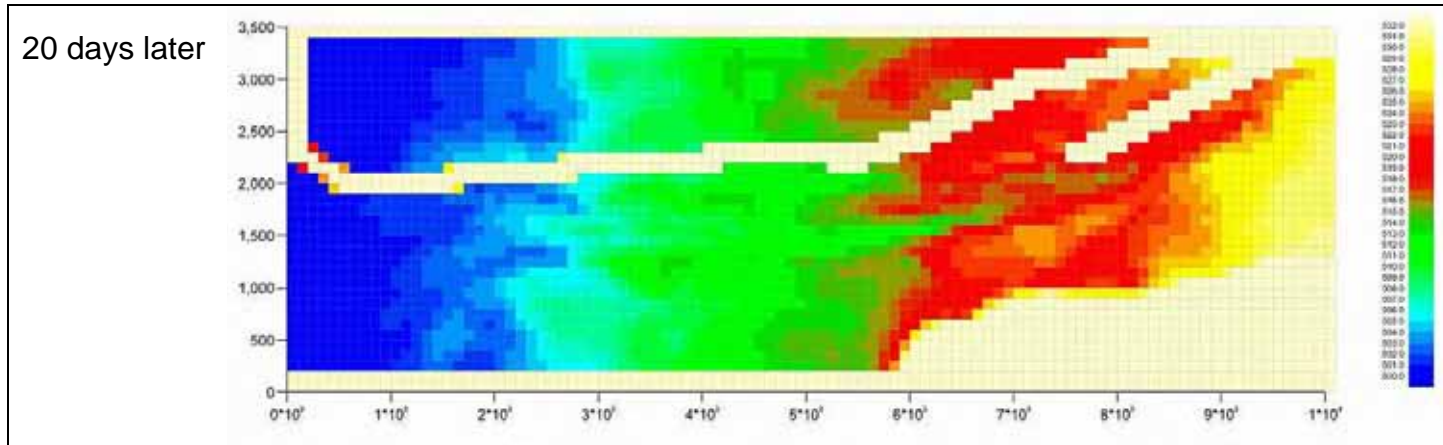


Fig. 2.2.20 Distribution of Flow Velocity on Riverbed Variation Analysis



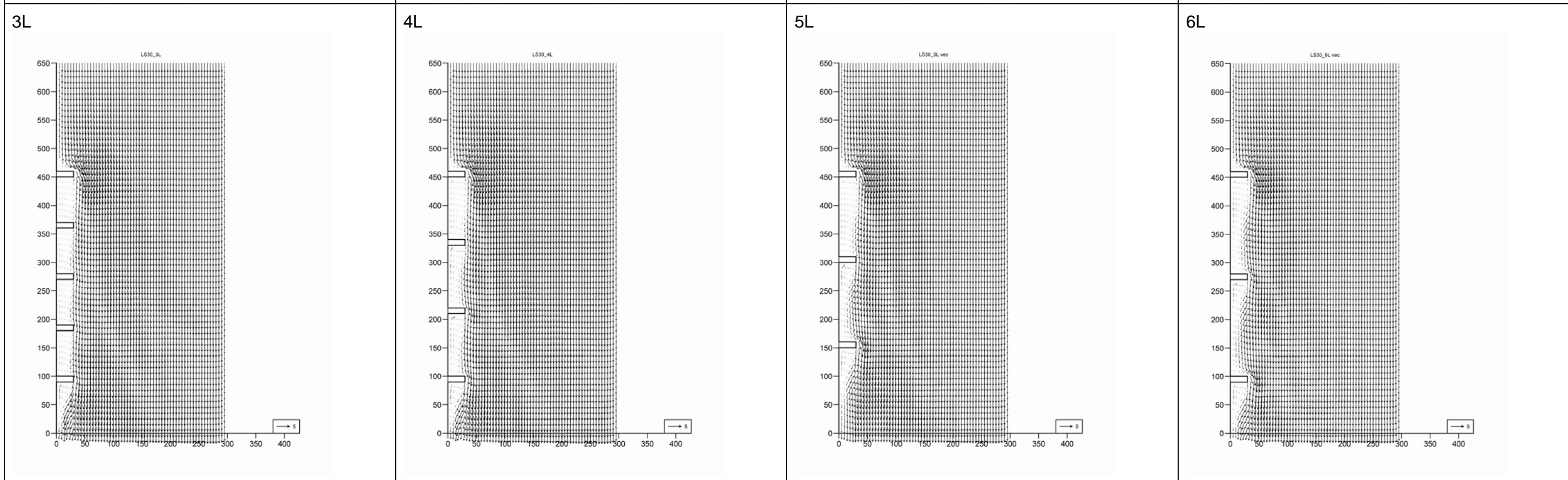
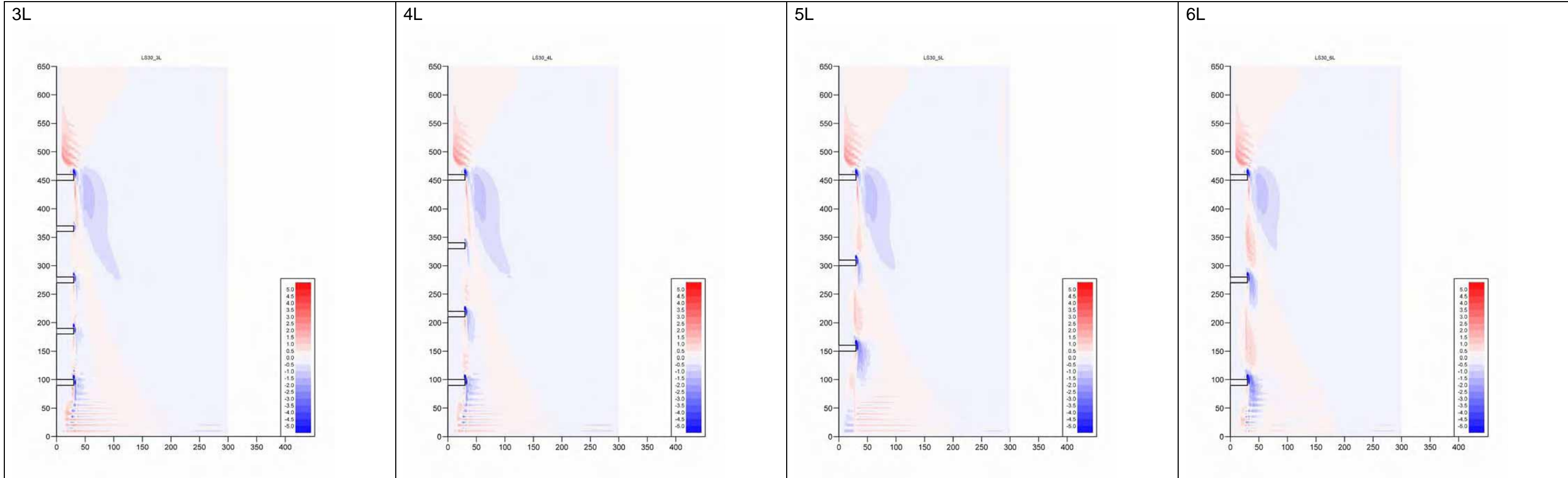
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Fig. 2.2.21(1) Ground Level Change and
 Differences of Riverbed Variation



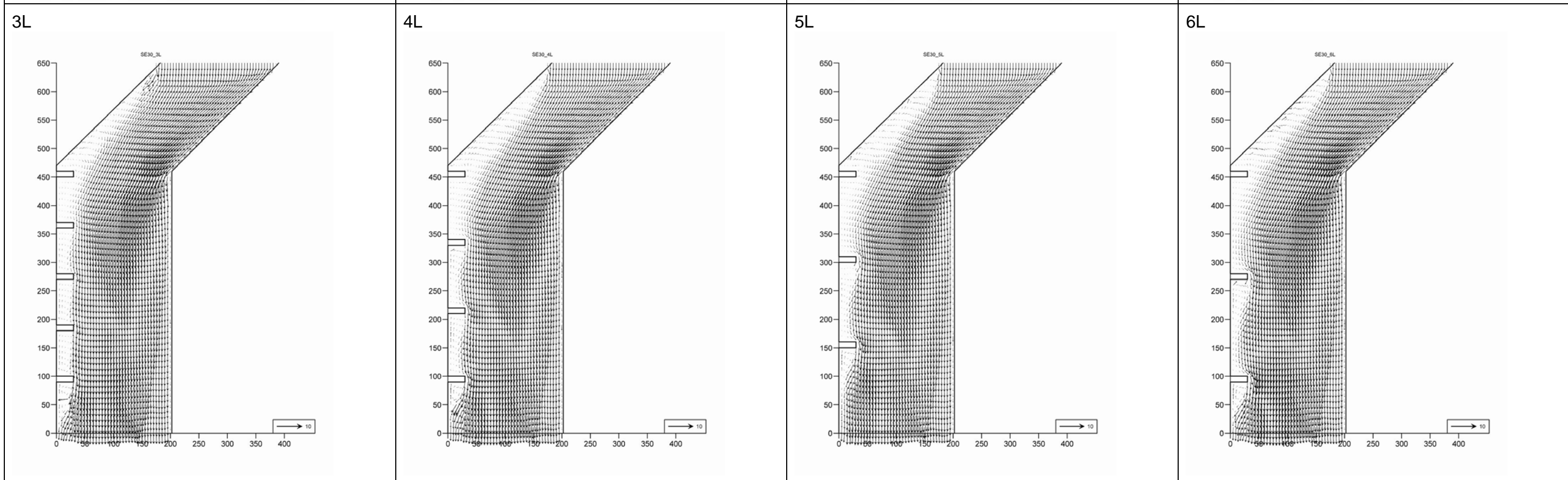
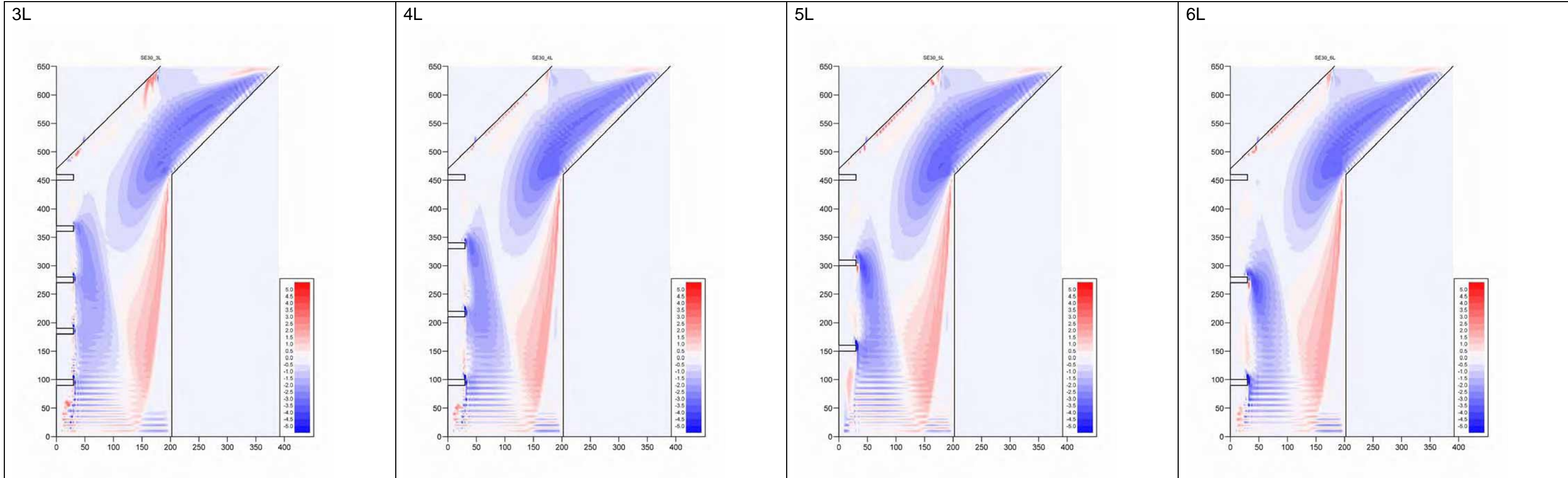
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Fig. 2.2.21(2) Ground Level Change and Differences of Riverbed Variation



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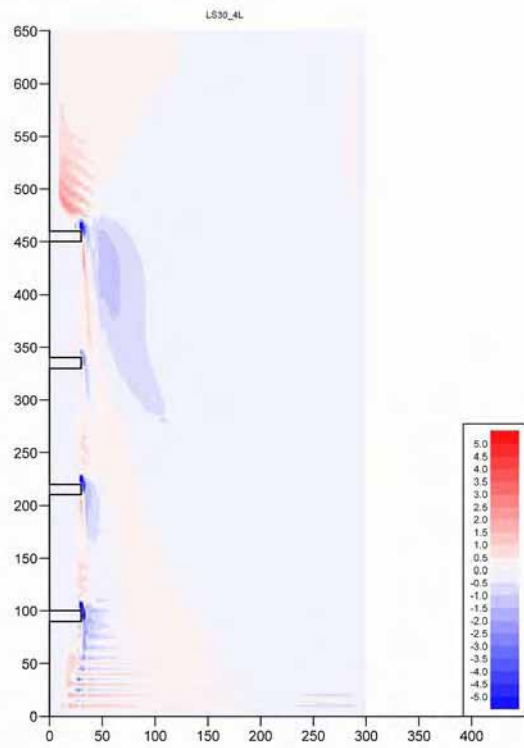
Fig. 2.2.22(1) Comparison of the Interval of
 Spur Dike (Large Scale Flood: 2005
 flood (4,700 m³/s))



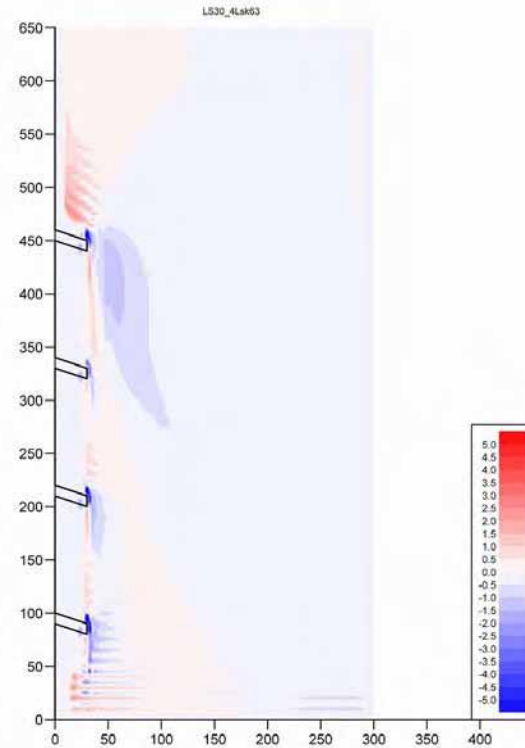
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PYANJ RIVER
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Fig. 2.2.22(2) Comparison of the Interval of
Spur Dike (Annual Max: 3,400
m³/s, Superelevational Flow)

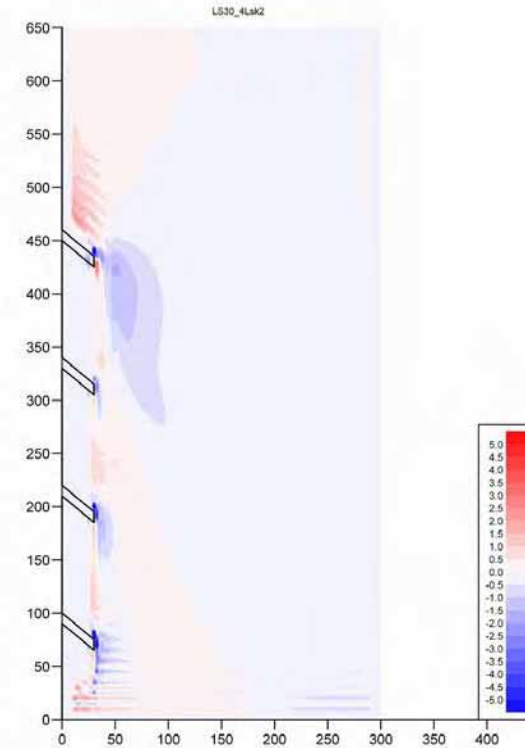
90°: 30.0 m



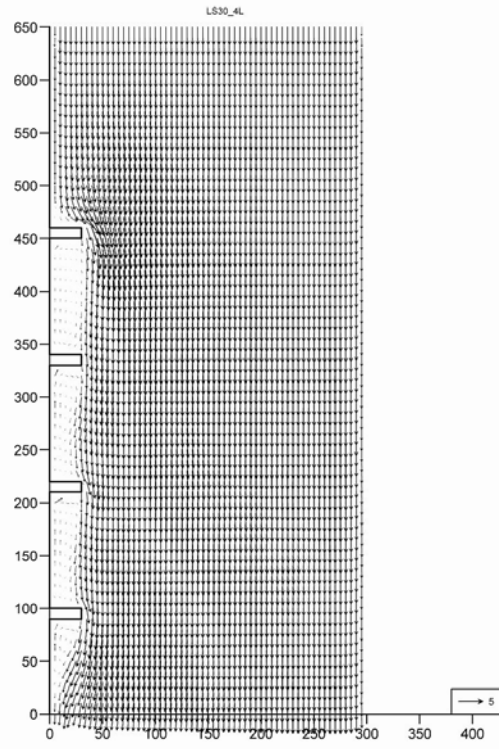
63°: 33.7 m



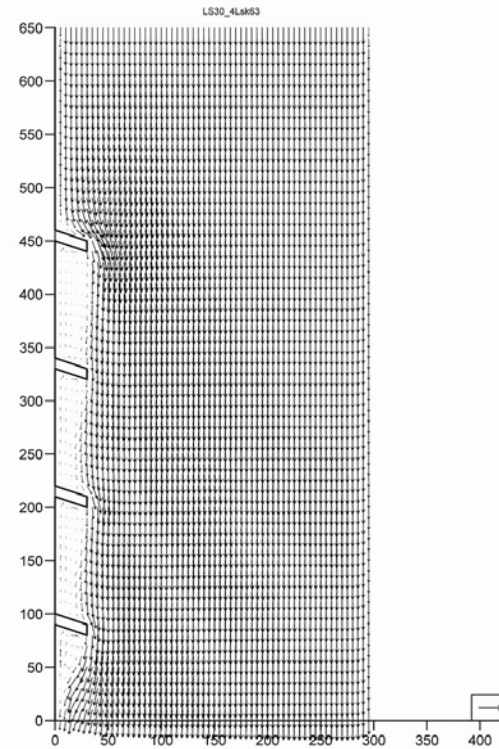
45°: 42.4 m



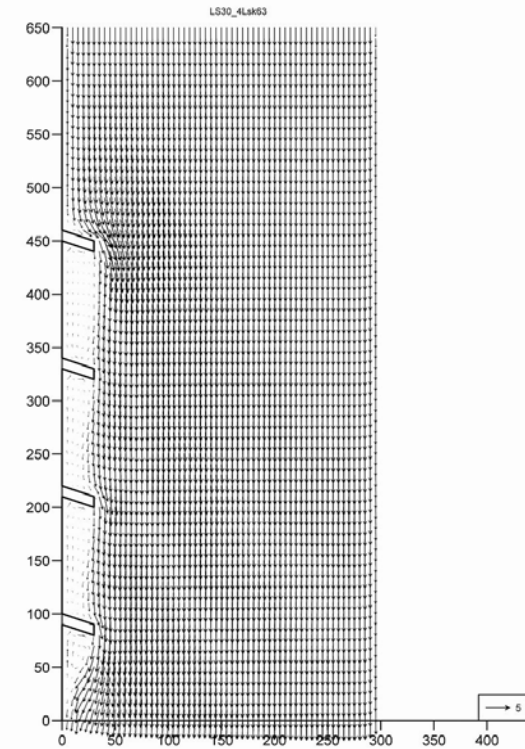
90°: 30.0 m



63°: 33.7 m



45°: 42.4 m

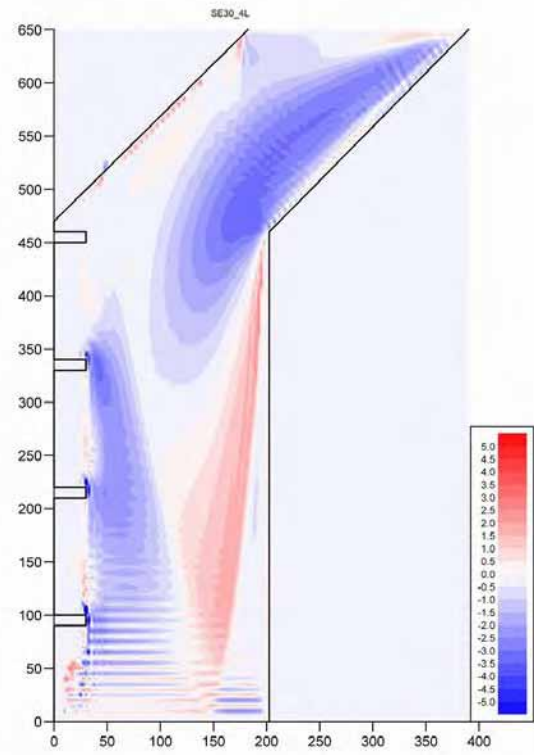


THE STUDY ON NATURAL DISASTER PREVENTION IN PYANJ RIVER

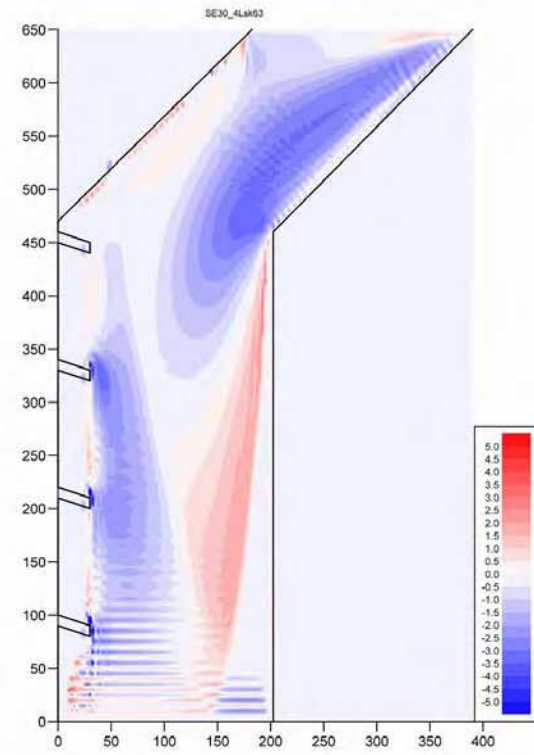
CTI INTERNATIONAL ENGINEERING CO., LTD.

Fig. 2.2.23(1) Comparison of the Angle of Spur Dike (Large Scale Flood: 2005 flood (4,700 m³/s))

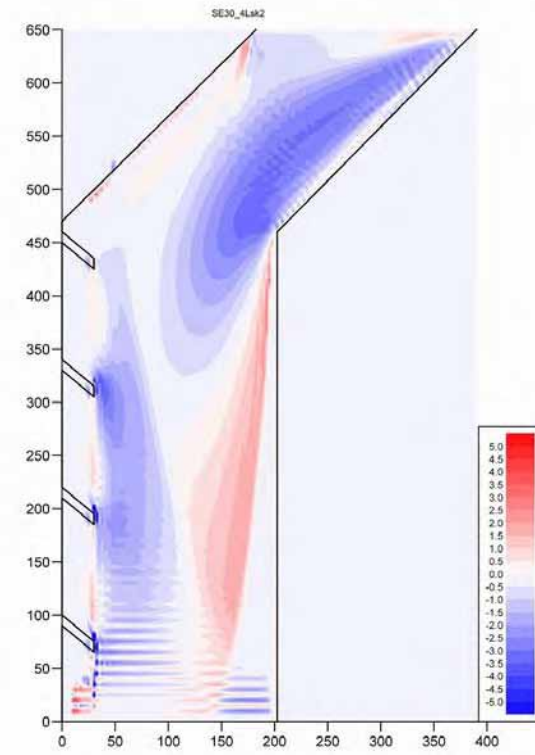
90°: 30.0 m



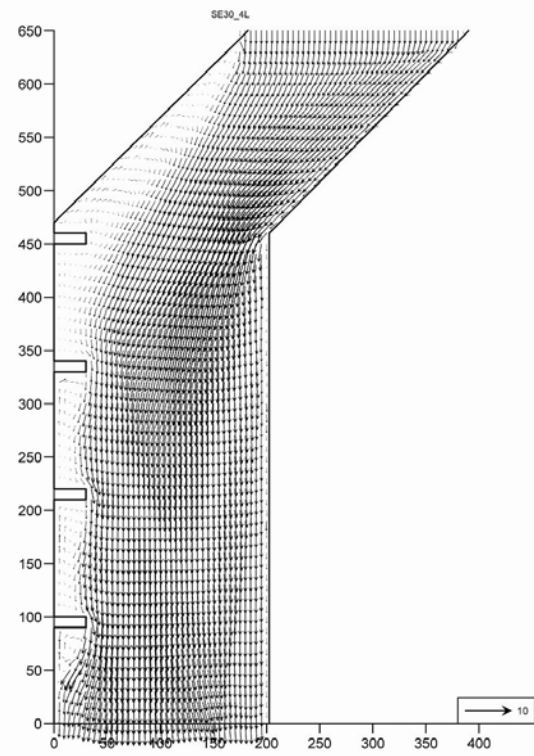
63°: 33.7 m



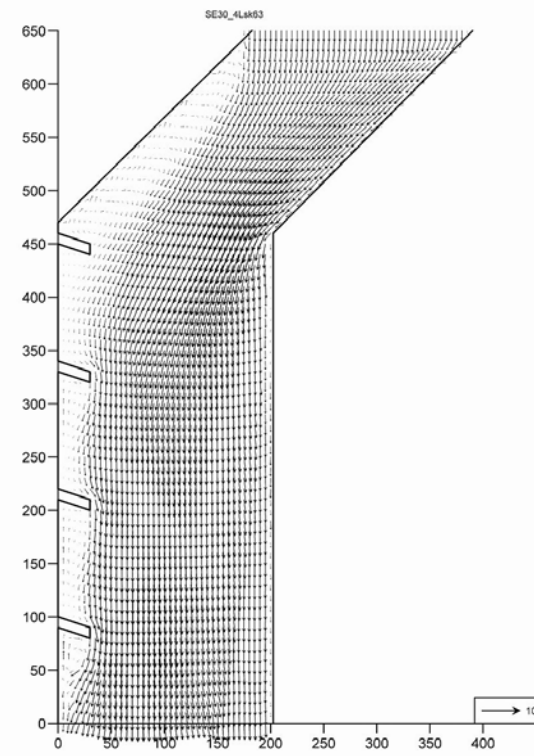
45°: 42.4 m



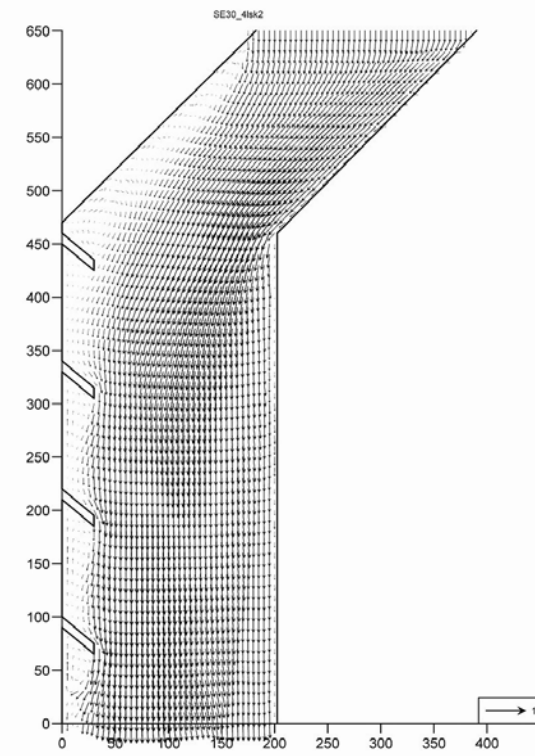
90°: 30.0 m



63°: 33.7 m

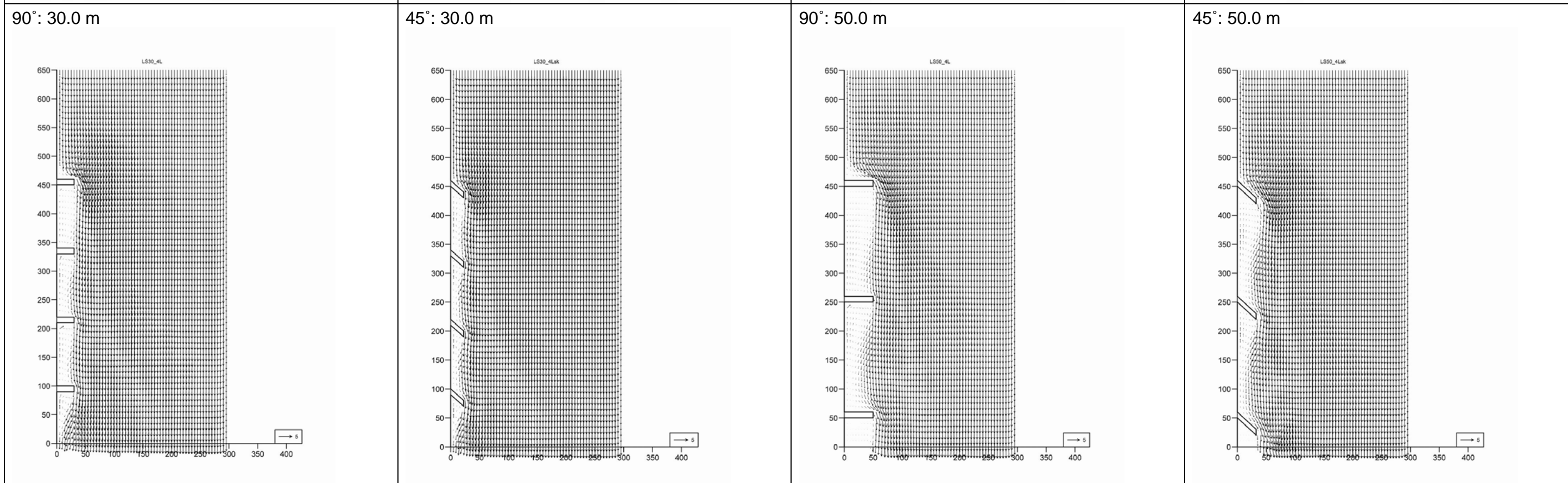
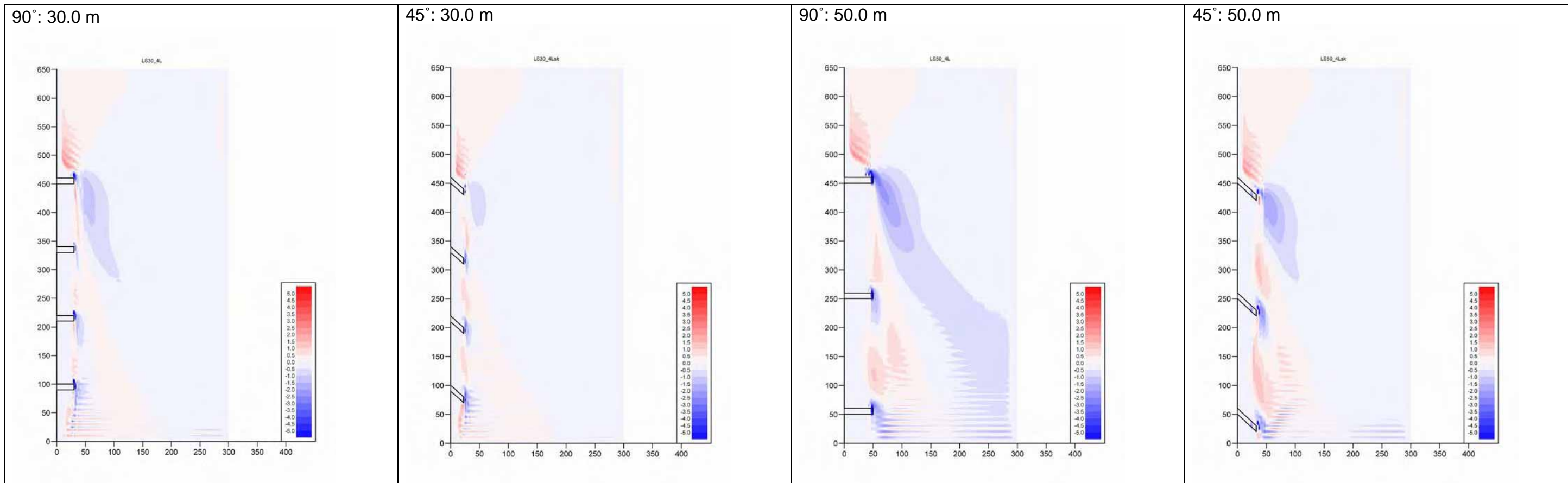


45°: 42.4 m



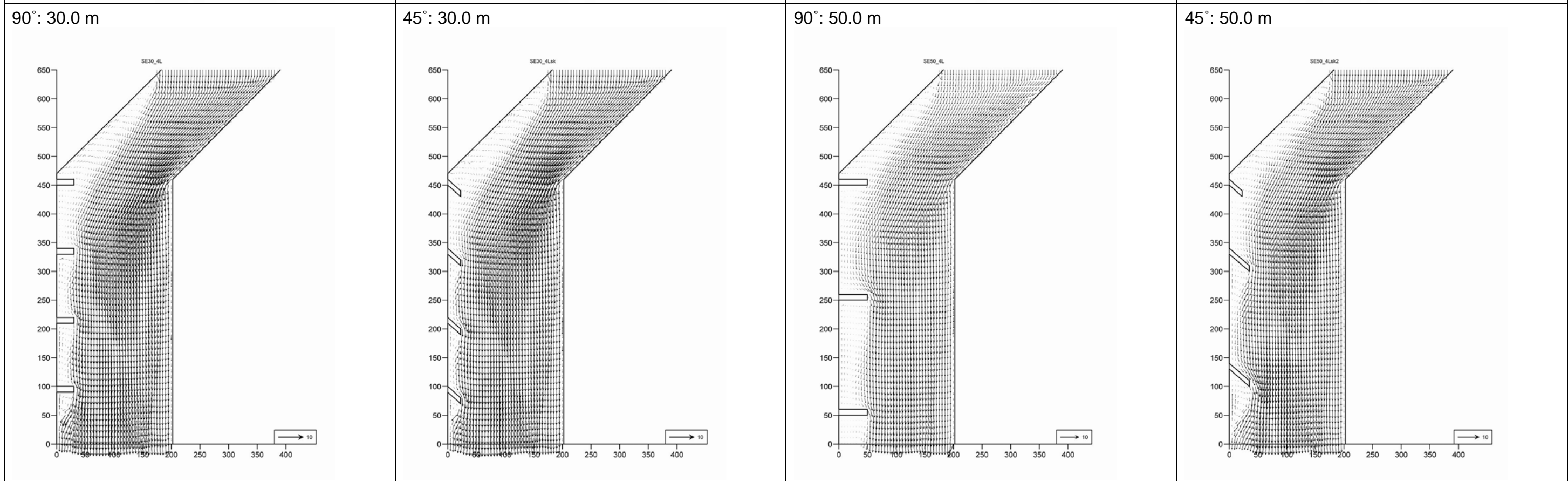
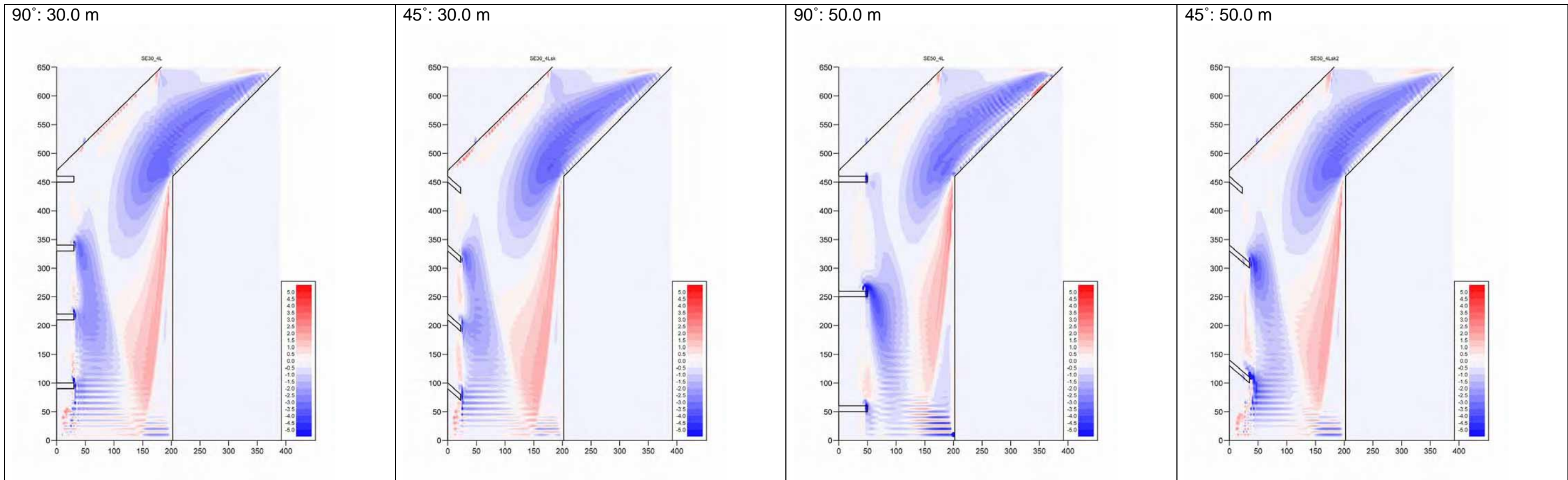
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Fig. 2.2.23(2) Comparison of the Angle of
Spur Dike (Annual Max 3,400 m³/s),
Superelevation Flow)



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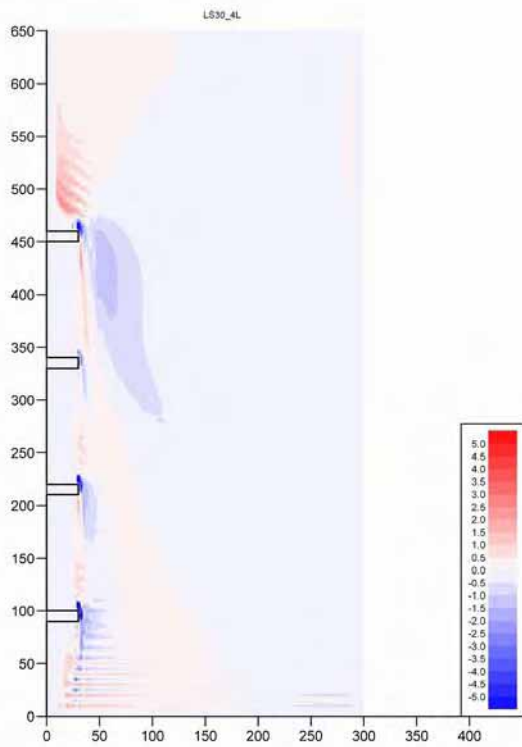
Fig. 2.2.24(1) Comparison of the Length of
Spur Dike (Large Scale Flood: 2005
flood (4,700 m³/s))



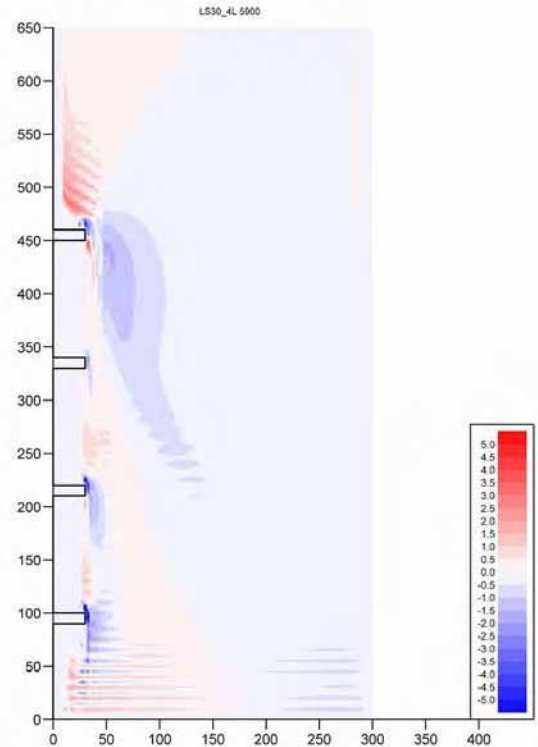
THE STUDY ON NATURAL DISASTER PREVENTION IN
PYANJ RIVER
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Fig. 2.2.24(2) Comparison of the Length of
Spur Dike (Annual Max: 3,400
m³/s, Super-elevation Flow)

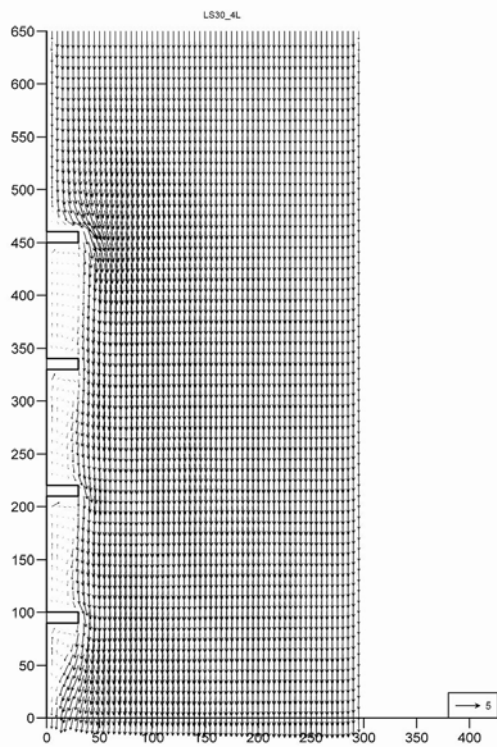
2005 Flood 4,700 m³/s



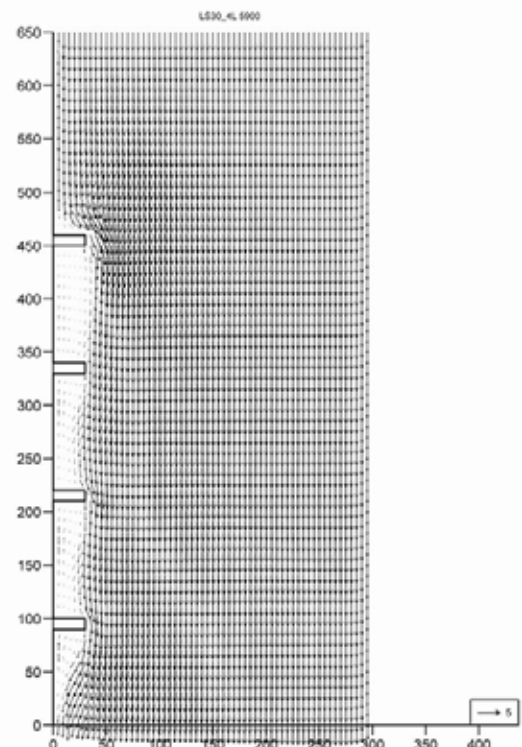
Design Discharge (1/100) 5,900 m³/s



2005 Flood 4,700 m³/s



Design Discharge (1/100) 5,900 m³/s



THE STUDY ON NATURAL DISASTER
PREVENTION IN PYANJ RIVER

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Fig. 2.2.25 Comparison of the Scale of Flow Discharge

Annex

***The Programme
of the Hydro-meteorological Stations and Posts'
Reconstruction for 2007 - 2016***

**The Programme
of the hydrometeorological stations and posts' reconstruction for 2007-2016**

Agency on hydrometeorology of the Republic of Tajikistan

Background

National hydrometeorological observation and monitoring system is a complex multi-level information basis aimed at (i) systematic environmental observation conduction and study, (ii) providing the governmental bodies, national economy branches, state organizations, departments and population with the information about the current and forecasted environment condition and climate in the republic.

The structure of the national hydrometeorological observation and monitoring system consists of the observations stations and posts, hydrometeorological centers (HMC), hydrometeorological observatory, environmental monitoring centers, automated communication center, hydrometeorological data processing and storage centre.

One of the key tasks of the effective hydrometeorological information supply is to provide reliable functioning of the national and international hydrometeorological infrastructures (observation system and forecast preparation). Based on the hydrometeorological observations information weather forecasts, water content predictions and early warning information of the extreme weather events (EWE), particularly, mudflow, avalanche, heavy rainfalls, hail hit, heavy storms, etc., are developed and national hydrometeorological and environmental hand-books and annual books are issued.

The territory of Tajikistan and its population are subjected to the active natural processes adverse impacts that cause natural disasters' frequent occurrence. Annually, more than 100 extreme weather events are observed in the republic that certainly, greatly impact on the national economy where a great amount of funds are spared for their consequences' limitation.

According to the UN experts' international estimations, natural disasters cause 80% of the national economy total damage. Monitoring and EWE forecasting will reduce the scale of their adverse impact, preventing and mitigating the foreseen damage.

International expertise shows that appropriate and rational use of the hydrometeorological information increases the economy effective development, however, currently, it is not used to a full capacity.

Resources for the work effective functioning and hydrometeorological early warning system enhancement should be considered as investments and other sources (ministries and departments of the republic that use the hydrometeorological information) are welcomed to attract their funds as well.

Providing hydrometeorological safety of the population, its ownership and the national economy branches is the main priority of the national state policy. In this, a series of the normative and legislative acts and resolutions was adopted. The Republic of Tajikistan, being the member of the World Meteorological Organization (WMO) provides the access of the international meteorological community to the national observation network data through its National Hydrometeorological Service (NHMS) and obtains the relevant information of other NHMS countries. This activity process is regulated by the 25th and 40th WMO Congress Resolutions (Kg-12). In order to develop the national hydrometeorological activity the following laws and regulations of the Republic of Tajikistan were adopted:

The Law of the Republic of Tajikistan "On hydrometeorological activity" #86 as of December 2, 2002;

The resolution of the Government of the Republic of Tajikistan "On the approval of a list of the objects that should be transferred into the concession and the objects that should not be transferred into the concession in accordance with the Government of the Republic of Tajikistan" #49 as of February 3, 2000;

The resolution of the Government of the Republic of Tajikistan "On the approval of the hydrometeorological network with the Intergovernmental Panel of the Commonwealth Independent States' agreement concept" #377 as of October 1, 2002;

The resolution of the Government of the Republic of Tajikistan "On hydrometeorological safety of the country-members of the Commonwealth of Independent States agreement concept" #394 as of October 1, 2004;

The resolution of the Government of the Republic of Tajikistan "On the individual activity types licensing agreement regulation" #337 as of September, 2005.

Key objectives of the NHMS:

- Conduction of the systematic observations over the climatic system and environment impacted by natural and anthropogenic factors;
- Providing state governmental bodies, the national economy branches and the population with the current and forecasted hydrometeorological and environmental information.

Hydrometeorological activity should be implemented as follows:

- Persistency of the environmental observations at global scale;
- Comparability of the observation methods and information collection, processing, storage and circulation;
- Cooperation with the interstate and international environmental monitoring systems;
- Accessibility, reliability, efficiency and in-time providing of the current and forecasted environmental and hydrological information.

The Programme includes a series of the principal approaches and directions aimed at the development of the hydrology, meteorology, agrometeorology, aerology, actinometry, glaciology, environmental monitoring, etc. Reconstruction and equipping of the observation network should be implemented in accordance with the full work volume and capacity.

1. The National Hydrometeorological Service (NHMS) current state

The NHMS should have the well-developed observation network to implement its main objectives and goals that meet the needs of the national economy promoting its sustainable development through reduction of the natural disasters hazards.

Currently, monitoring and observation network consists of 57 hydrometeorological stations (1, 2, 3 levels), in particular, there are 2 hydrometeorological centers, 1 hydrometeorological observatory, 35 meteorological stations, 5 hydrological stations, 1 aerological station, 4 specialized stations and 126 posts (hydro-meteo-agro-snow/avalanche); there are 8 benchmark stations aimed at sustainable and uninterrupted observation conduction; the data received considered of high importance as basing on them, climate change timely trends are set. Tajikistan's 14 stations and 10 hydrological posts promote the process of the global information and data exchange. However, for the time being, the national observation network state doesn't meet generally accepted requirements criteria and cannot provide the Republic's participation in the Global Observation System. Within the period of 1991-2005 the national hydrometeorological network was reduced by 20%. It is necessary to fully repair 38 hydrometeorological stations and 30 hydrometeorological posts, reconstruct 6 stations, 10 posts and 18 air pollution observation posts (APOP).

NHMS doesn't have sufficient funds to develop the functioning of the observation network system. A number of stations are closed, the work volume of the other ones is considerably reduced. Almost all of the stations are equipped with the out-of-date technical devices and new hydrometeorological equipments for the information collection, processing and circulation are not provided as the factories producing them located abroad. NHMS is lack of qualified personnel and specialists. Automated communication level of the national Agency is far behind in comparison with other countries'.

The main objective of the automated communication supply of the national observation network is to preserve the observation processes in remote regions of the Republic. However, current automated work places of the specialists engaged into the operational implementation of the observation materials and data processing can be estimated as unsatisfactory.

Main reasons of the network reconstruction needs:

- Observation network reduction due to insufficient funding;
- Unsatisfactory state of the observation network which doesn't meet internationally accepted requirement criteria;
- Transition to the modern economy conditions;
- Lack of the atmosphere remote zonding, high resolution satellite information and automated stations and posts.

On the other hand, the progress of the NHMS and its considerable contribution into the national economy sustainable development can be reached through:

- Reconstruction of the stations and posts network in accordance with internationally accepted requirement criteria;
- Sufficient funding and technical equipping;
- Preparation of high-qualified personnel and specialists;
- Sustainable regional cooperation.

Therefore, the Programme realization will potentially improve the national hydrometeorological observation network system though and promote the national economy branches sustainable development.

2. The Programme objective

The programme objective is to plan definite activities and measures for effective hydrometeorological monitoring and environmental system up and development.

The Programme includes:

- Hydrometeorological network reconstruction;
- Enhancement of the hydrometeorological and services quality, implementation of the obligations in area of hydrometeorology due to international agreements and resolutions represented by the Republic of Tajikistan;
- Development of method system to predict natural disasters and extreme weather events (i.e. mudflows, avalanches, heavy rainfalls, hail-hit, floods, heavy winds, droughts, etc.);
- Improvement of the early-warning notification system;
- Improvement of the hydrometeorological information providing;
- Broadening and enlargement of the providing area;
- Improvement of the observation system, climate and climate change assessments, and integration into the Global Climate Observation System (GCOS) and Surface Land Hydrology Global Observation Network.

This can be implemented through:

1. Reconstruction and equipping of the hydrometeorological network with up-to-date technical devices and development of the complex observation system;
2. Sustainability of the national hydrometeorological observation network, in particular (i) start-up of the agrological actinometrical observations; (ii) development of the agro meteorological observation and research of the pastures vegetation; (iii) start-up of the automated observation network in remote and difficult-to-access regions; (iv) development of the snow and glacial observations to a full capacity.
3. Improvement of the data analysis, systematization and archiving system;
4. Application of advanced technologies and international expertise in the area of forecasting and prediction;
5. Installation and set-up of the telecommunication system that provide automated information collection, processing and circulation in-and-out of the Republic (i.e. meteorological telecommunication regional and global centers);
6. Installation and set-up of the high-resolution satellite meteorological information receipt (HRPT) to provide reliability and accuracy of the weather forecast, environmental monitoring, snow reserves state assessment, water resources and glaciers dynamics observations;
7. Raising the personnel and specialists' qualification in accordance with the modern requirements.

3. The Programme goals

The Programme strategy goal is to constantly reconstruct all branches of the national hydrometeorological service of the Republic Tajikistan to a full capacity, particularly:

- Providing the governmental organizations and population with the qualitative information about current weather conditions (including extreme weather events, agriculture production and forecast of the river flow regime, environmental monitoring information, etc.);
- Providing the main national economy branches, tourism and recreation sphere, medicine field, etc. with the specialized forecast information;
- Study of the climate change adverse impacts on the national economy and natural resources;
- Providing the users with the climate and environmental information;
- Study assessment of the glaciers and mountainous outburst lakes, mudflow and avalanche hazardous regions' current state and condition.

4. The Programme directions

The Programme key directions is to provide the relevant state bodies, population and national economy branches with the current and forecasted weather condition and information of the expected extreme weather events. The Programme key directions were elaborated in accordance with the following principles:

- Preservation and further development of the observation network and protected zones to receive reliable hydrometeorological information;
- Equipping of the observation network with the up-to-date technical devices and advanced technologies;
- Reconstruction of the automated stations and posts' network;
- Improvement of the early warning service system on extreme weather events occurrence;
- Improvement of the data base storage system;
- Preparation and issuing of the scientific and applied information books;
- Rising of the personnel and specialists' qualification and technical providing.

5. Expected outcomes

The Programme realization will provide the observation network and monitoring system (i.e. hydrometeorological, climatic and environmental) set-up in Tajikistan in accordance with the national needs and international requirements. The Programme realization will promote the NHMS further development; the basis of the applied hydrometeorological researches in Tajikistan will be set-up. Furthermore, in accordance

with the national and international hydrometeorological agreements and resolutions, the national hydrometeorological service will be able to implement the following:

- Rational implementation of the unique state policy in area of the hydrometeorological activity on the territory of Tajikistan;
- Focusing of the state information resources in area of hydrometeorology and establishment of the unique state environmental database;
- Hydrometeorological, agrometeorological and glaciological description and analysis of the various regions of the Republic;
- Conduction of the hydrometeorological researches and analysis of the environmental state (i.e. atmosphere, surface waters, soil, radiation condition, etc.) in the regions of the planned economy objects, recreation and rehabilitation zones construction;
- Analysis of the regions hazardous to the extreme weather events (mudflows, avalanches, floods, heavy winds, etc.); identification and elaboration of the preventive measures;
- Check up and in-time repair of the hydrometeorological devices and equipments;
- Itinerary analysis of the agriculture pastures and fields;
- Construction of the wide hydrometeorological observation network;
- Monitoring of the snow and glacial current resources;
- Providing the main national economy branches with the specialized information about current and expected weather conditions;
- Providing the forecasted information about the Amur-Darya river basin water flow;
- Licensing of the hydrometeorological activity in accordance with the Legislative mechanisms of the Republic Tajikistan.

6. The Programme realization mechanisms

The Programme will be realized within 10 years and should be implemented through a number of organizations and technical activities support. In the Programmes frameworks it is expected to reconstruct the observation network system, fully repair the service living places of the stations, equipping them with the up-to-date technical devices, integrate the advanced methods of forecasting, develop satellite information receipt system, improve the data processing, circulation and archiving, automatize the stations and posts, study of the snow and glacial resources and prepare the high-qualified personnel. The Programme will be implemented by the government of the Republic Tajikistan and international organizations.

7. Funding support

The Programme funding will be considered under:

- The State budget;
- International grants;
- WMO Voluntary Coop Programme

Moreover, funding support from the side of the Ministries and departments, organizations and other institutes (that systematically use operational and specialized information) is welcomed, if not contradicted to the legislation of the Republic Tajikistan. The executive body of the Programme implementation is the Agency on hydrometeorology in accordance with the Programme outputs (Annex I). Summary funding indicators of the Programme are identified in the table below (Annex II).

The Programme realization will stabilize the operational activity of the NHMS and enhance its technical basis.

*The Programme funding support summary for 2007-2016
(approximate prices as of 2006z)*

#	Outputs	Sum (Somoni, the national currency)
1	Reconstruction of the hydrometeorological observation and monitoring network system	14 395 000
2	Reconstruction of the environmental monitoring network system	4 207 500
3	Improvement of the hydrometeorological data collection, analysis and archiving system	1 572 500
4	Improvement of the forecast and service providing system	1 350 000
5	Start-up and regular conduction of the research and expeditionary works	1 060 000
6	Raising the personnel and specialists' qualification	900 000
	TOTAL:	23 485 000

Annex I

The schedule of the Programme outputs for 2007-2016

#	Outputs	Executors	Time
1	Reconstruction of the hydrometeorological observation and monitoring network system		
1.1	Reconstruction and full repair of the service living buildings, hydrometeorological allocation places of 40 meteorological stations and 43 hydrological posts, equipping with the technical devices	Agency on hydrometeorology	2007-2016
1.2	Purchase of the meteorological, actinometrical, aerological, hydrological, agrometeorological, aviameteorological, radiometrical measurement devices and computers to provide the hydrometeorological observation network full capacity	Agency on hydrometeorology	2007-2016
1.3	Set-up of the automated working places that deal with the synopsis, satellite meteorology, hydrological forecasting, agrometeorology, actinometry, aerology, radiometeorology, climatology to analyze the hydrometeorological data	Agency on hydrometeorology	2007-2012
1.4	Reconstruction of the aerological observation in Dushanbe and Khorog	Agency on hydrometeorology	2007-2016
1.5	Reconstruction of the automated stations and posts' network in remote and difficult-to-access regions of the Republic	Agency on hydrometeorology	2007-2016
1.6	Purchase and set-up of the complex and check-up equipment and hydrological calibration gutter named after Uryvaev	Agency on hydrometeorology, Standardization agency Ministry of economy and trade	2007-2016
1.7	Completion of the administrative buildings of the NHMS construction	Agency on hydrometeorology Ministry of economy and trade	2007-2010
2	Reconstruction of the environmental monitoring network system		
2.1	Purchase of the mobile laboratories and array station on surface water and soil pollution	State Committee for environmental protection and forestry Agency on hydrometeorology	2007-2009
2.2	Equipping of the chemical laboratories with up-to-date analysis devices in Dushanbe, Kurgan-Tube, Kujand and Yavan	State Committee for environmental protection and forestry Agency on hydrometeorology	2007-2015
2.3	Set-up and up-to-date equipping of the chemical laboratory in Tursunzade	Tajik Aluminum Plant, Agency on hydrometeorology	2007-2016
2.4	Reconstruction of the observation network system over the transboundary surface waters pollution monitoring	Agency on hydrometeorology	2007-2009
2.5	Reconstruction of the observation network system over the transboundary atmospheric air pollution monitoring	Agency on hydrometeorology	2007-2011
3	Improvement of the hydrometeorological data collection, analysis and archiving system		
3.1	Set-up of the hydrometeorological data collection, processing and archiving automated system	Agency on hydrometeorology	2007-2010
3.2	Transformation of the hard copy observation data	Agency on hydrometeorology	2007-2010

	information into the electronic copy version		
3.3	Set-up of the high-resolution satellite meteorological information receipt (HRPT) to provide reliability and accuracy of the weather forecast, environmental monitoring, snow reserves condition assessment, vegetation state and water resources and glaciers dynamic state.	Agency on hydrometeorology Astrophysics Institute of the Academy of science International organizations	2007-2013
4	Improvement of the forecast and service providing system		
4.1	Development and integration of the advanced methods of short-term, mid-term and long-term meteorological, agrometeorological, hydrological and other forecasting	Agency on hydrometeorology совместно с ГИМС СНГ	2007-2009
4.2	Integration of the advanced methods of the mean monthly/seasonal temperature and precipitation forecast according to the regions of the Republic	Agency on hydrometeorology in cooperation with the CIS NHMS	2007-2010
4.3	Integration of the advanced methods of the agrometeorological forecasting to identify agriculture crops vegetation	Agency on hydrometeorology Сельхоз Академия	2007-2010
4.4	Development and integration of the advanced methods of Republic's river water content through application of the mountainous snow cover data (i.e. itinerary avia-remote snow reserves measurement shooting and photographing; satellite information receipt)	Agency on hydrometeorology in cooperation with the CIS NHMS Astrophysics Institute of the Academy of science	2007-2008
4.5	Set-up of the state accounting unique system of the national water resources, their quality and use	Agency on hydrometeorology in cooperation with the Ministry of water management and melioration and State Committee for geology	2007-2016
4.6	Elaboration of the long-term hydrometeorological safety strategy of the Republic Tajikistan and improvement of the information system through reliable and accurate data providing on weather and climate change conditions on the territory of the Republic.	Agency on hydrometeorology in cooperation with the Ministry of emergency	2007-2010
4.7	Set-up of the extreme weather events database	Agency on hydrometeorology in cooperation with the Ministry of emergency	2007-2009
4.8	Improvement of the assessment methods of the weather and climate change condition (including SWE) adverse impacts on the vulnerable sectors of the national economy	Agency on hydrometeorology in cooperation with the Ministry of emergency and Academy of Science	2007-2009
4.9	Identification of all climatic, agroclimatic and hydrological resources of the Republic and ways of the extreme weather events dissemination	Agency on hydrometeorology in cooperation with the Ministry of emergency	2007-2011
5	Start-up and regular conduction of the research and expeditionary works		
5.1	Aerovisual and itinerary observations of the pasture vegetation, agriculture crops vegetation and monitoring of the mudflow and avalanche hazardous regions	Agency on hydrometeorology in cooperation with the Ministry of emergency, Ministry of agriculture and Ministry of science	2007-2016
5.2	Reconstruction of the snow and glacial resources monitoring system, enlargement of the snow observation network, providing equipment for the snow cover automated measurement; conduction	Agency on hydrometeorology in cooperation with the Academy of science	2007-2016

HC – Hydrometeorology Center

	of the glaciers inventory		
5.3	Reconstruction of the observation network system of the mountainous outburst lakes	Agency on hydrometeorology, Academy of science	2007-2016
5.4	Conduction of the researches of the climate change study	Agency on hydrometeorology	2007-2016
5.5	Capacity building of the climate observation system, in particular: - Providing reliability and accuracy of the observations in accordance with the appropriate requirements; - Observations of other environmental factors that cause climate change; - Climatic data collection and the analysis system development; - Participation in GCOS and providing regular climatic data to its branch centers	Agency on hydrometeorology	2007-2016
5.6	Preparation and implementation of the greenhouse gas reduction projects	Agency on hydrometeorology Ministry of energy, Ministry of industry Ministry of economy and trade, Ministry of health Academy of science	2007-2016
5.7	Conduction of the researches in area of the renewable energy resources use in Tajikistan	Agency on hydrometeorology in cooperation with the Ministry of energy and Academy of science	2007-2016
5.8	Providing the national economy branches with the climatic data	Agency on hydrometeorology	2007-2016
6	Raising the personnel and specialists' qualification		
6.1	Raising the personnel and specialists' qualification through the training courses arranged by the WMO Regional Meteorological Training Centers (RMTC)	Agency on hydrometeorology WMO RTMC, Ministry of education	2007-2016
6.2	Training the specialists at the colleges and high schools of the CIS and foreign countries	Agency on hydrometeorology CIS NHMS, WMO Ministry of education	2007-2016

Acronyms

WMO – World Meteorological Organization

HMO – Hydrometeorological observatory

GCOS -Global Climate Observing System

GNLO-H - Global Net Land Observation- Hydrology

GTS - Global Telecommunication system

IHC CIS - Intergovernmental Hydrometeorological Council of Commonwealth of Independent States

NHMS – National Hydrometeorological Service

VCP - Voluntary Cooperation Programme

AS AP - Array station on air pollution

RMTC - Regional Meteorological Training Center

RT – Republic of Tajikistan

EWE – Extreme weather events

Annex II

The Programme fund indicators for 2007-2016

#	Outputs	Funds for 2007 -2016 (Somoni, the national currency)	Funding sources	
			State budget	Non-state budget
1	Reconstruction of the hydrometeorological observation and monitoring network system			
1.1	Reconstruction and full repair of the service living buildings, hydrometeorological allocation places of 40 meteorological stations and 43 hydrological posts, equipping with the technical devices	3 325 000	875 000	2 450 000
1.2	Purchase of the meteorological, actinometrical, aerological, hydrological, agrometeorological, aviameteorological, radiometrical measurement devices and computers to provide the hydrometeorological observation network full capacity	5 610 000	2 310 000	3 300 000
1.3	Set-up of the automated working places that deal with the synopsis, satellite meteorology, hydrological forecasting, agrometeorology, actinometry, aerology, radiometeorology, climatology to analyze the hydrometeorological data	1 020 000	420 000	600 000
1.4	Reconstruction of the aerological observation in Dushanbe and Khorog	1 360 000	560 000	800 000
1.5	Reconstruction of the automated stations and posts' network in remote and difficult-to-access regions of the Republic	1 530 000	630 000	900 000
1.6	Purchase and set-up of the complex and check-up equipment and hydrological calibration gutter named after Uryvaev	850 000	350 000	500 000
1.7	Completion of the administrative buildings of the NHMS construction	700 000	700 000	
	TOTAL:	14 395 000	5 845 000	8 550 000
2	Reconstruction of the environmental monitoring network system			
2.1	Purchase of the mobile laboratories and array station on surface water and soil pollution	2 295 000	945 000	1 350 000
2.2	Equipping of the chemical laboratories with up-to-date analysis devices in Dushanbe, Kurgan-Tube, Kujand and Yavan	1 020 000	420 000	600 000
2.3	Set-up and up-to-date equipping of the chemical laboratory in Tursunzade	425 000	175 000	250 000
2.4	Reconstruction of the observation network system over the transboundary surface waters pollution monitoring	85 000	35 000	50 000
2.5	Reconstruction of the observation network system over the transboundary atmospheric air pollution monitoring	382,500	157 500	225 000
	TOTAL:	4 207 500	1 732 500	2 475 000
3	Improvement of the hydrometeorological data collection, analysis and archiving system			

3.1	Set-up of the hydrometeorological data collection, processing and archiving automated system	425 000	175 000	250 000
3.2	Transformation of the hard copy observation data information into the electronic copy version	42 500	17 500	25 000
3.3	Set-up of the high-resolution satellite meteorological information receipt (HRPT) to provide reliability and accuracy of the weather forecast, environmental monitoring, snow reserves condition assessment, vegetation state and water resources and glaciers dynamic state.	1 105 000	455 000	650 000
	TOTAL:	1 572 500	647 500	925 000
4	Improvement of the forecast and service providing system			
4.1	Development and integration of the advanced methods of short-term, mid-term and long-term meteorological, agrometeorological, hydrological and other forecasting	127 500	52, 500	75 000
4.2	Integration of the advanced methods of the mean monthly/seasonal temperature and precipitation forecast according to the regions of the Republic	127 500	52 500	75 000
4.3	Integration of the advanced methods of the agrometeorological forecasting to identify agriculture crops vegetation	85 000	35 000	50 000
4.4	Development and integration of the advanced methods of Republic's river water content through application of the mountainous snow cover data (i.e. itinerary avia-remote snow reserves measurement shooting and photographing; satellite information receipt)	382 500	157 500	225 000
4.5	Set-up of the state accounting unique system of the national water resources, their quality and use	340 000	140 000	200 000
4.6	Elaboration of the long-term hydrometeorological safety strategy of the Republic Tajikistan and improvement of the information system through reliable and accurate data providing on weather and climate change conditions on the territory of the Republic.	85 000	35 000	50 000
4.7	Set-up of the extreme weather events database	75 000		75 000
4.8	Improvement of the assessment methods of the weather and climate change condition (including SWE) adverse impacts on the vulnerable sectors of the national economy	63 750	26 250	37 500
4.9	Identification of all climatic, agroclimatic and hydrological resources of the Republic and ways of the extreme weather events dissemination	63 750	26 250	37 500
	TOTAL:	1 350 000	525 000	825 000

5	Start-up and regular conduction of the research and expeditionary works			
5.1	Aerovisual and itinerary observations of the pasture vegetation, agriculture crops vegetation and monitoring of the mudflow and avalanche hazardous regions	425 000	175 000	250 000
5.2	Reconstruction of the snow and glacial resources monitoring system, enlargement of the snow observation network, providing equipment for the snow cover automated measurement; conduction of the glaciers inventory	212 500	87 500	125 000
5.3	Reconstruction of the observation network system of the mountainous outburst lakes	212 500	87 500	125 000
5.4	Conduction of the researches of the climate change study	50 000		50 000
5.5	Capacity building of the climate observation system, in particular: - Providing reliability and accuracy of the observations in accordance with the appropriate requirements; - Observations of other environmental factors that cause climate change; - Climatic data collection and the analysis system development; - Participation in GCOS and providing regular climatic data to its branch centers	85 000	35 000	50 000
5.6	Preparation and implementation of the greenhouse gas reduction projects	25 000		25 000
5.7	Conduction of the researches in area of the renewable energy resources use in Tajikistan	25 000		25 000
5.8	Providing the national economy branches with the climatic data	25 000		25 000
	TOTAL:	1 060 000	385 000	675 000
6	Raising the personnel and specialists' qualification			
6.1	Raising the personnel and specialists' qualification through the training courses arranged by the WMO Regional Meteorological Training Centers (RMTC)	300 000		300 000
6.2	Training the specialists at the colleges and high schools of the CIS and foreign countries	600 000		600 000
	TOTAL:	900 000		900 000
	GRAND TOTAL:	23 485 000	9 135 000	14 350 000

The Programme funds allocation for 2007-2016

#	Outputs	State/ Non-state budget	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1		2	3	4	5	6	7	8	9	10	11	12
1 Reconstruction of the hydrometeorological observation and monitoring network system												
1.1	Reconstruction and full repair of the service living buildings, hydrometeorological allocation places of 40 meteorological stations and 43 hydrological posts, equipping with the technical devices	875000	87500	87500	87500	87500	87500	87500	87500	87500	87500	87500
		2450000	245000	245000	245000	245000	245000	245000	245000	245000	245000	245000
1.2	Purchase of the meteorological, actinometrical, aerological, hydrological, agrometeorological, aviameeteorological, radiometrical measurement devices and computers to provide the hydrometeorological observation network full capacity	2310000	231000	231000	231000	231000	231000	231000	231000	231000	231000	231000
		3 00000	330000	330000	330000	330000	330000	330000	330000	330000	330000	330000
1.3	Set-up of the automated working places that deal with the synopsis, satellite meteorology, hydrological forecasting, agrometeorology, actinometry, aerology, radiometeorology, climatology to analyze the hydrometeorological data	420000	70000	70000	70000	70000	70000	70000				
		600000	100000	100000	100000	100000	100000	100000				
1.4	Reconstruction of the aerological observation in Dushanbe and Khorog	560000					280000					280000
		800000					400000					400 000
1.5	Reconstruction of the automated stations and posts' network in remote and difficult-to-access regions of the Republic	630000	63000	63000	63000	63000	63000	63000	63000	63000	63000	63000
		900000	90000	90000	90000	90000	90000	90000	90000	90000	90000	90000
1.6	Purchase and set-up of the complex and check-up equipment and hydrological calibration gutter named after Uryvvaev	350000		350000								
		500000		500000								
1.7	Completion of the administrative buildings of the NHMS construction	700000	200000	300000	200000							
TOTAL:		5845000	651500	1101500	651500	451500	731500	451500	381500	381500	381500	661500
		8550000	765000	1265000	765000	765000	1165000	765000	665000	665000	665000	1065000
2 Reconstruction of the environmental monitoring network system												
2.1	Purchase of the mobile laboratories and array station on surface water and soil pollution	945000	94500	94500	94500	94500	94500	94500	94500	94500	94500	94500
		1350000	135000	135000	135000	135000	135000	135000	135000	135000	135000	135000
2.2	Equipping of the chemical laboratories with up-to-date analysis devices in Dushanbe, Kurgan-Tube, Kujand and Yavan	420000			105000		105000		105000		105000	
		600000			150000		150000		150000		150000	
2.3	Set-up and up-to-date equipping of the chemical laboratory in Tursunzade	175000				58300	58300	58400				
		250000				83300	83300	83400				
2.4	Reconstruction of the observation network system over the transboundary surface waters pollution monitoring	35000		17500	17500							
		50000		25000	25000							
2.5	Reconstruction of the observation network system over the transboundary atmospheric air pollution monitoring	157500				78750	78750					
		225000				112500	112500					
TOTAL:		1732500	94500	112000	217000	231550	336550	152900	199500	94500	199500	94500
		2475000	135000	160000	310000	330800	480800	218400	285000	135000	285000	135000
3 Improvement of the hydrometeorological data collection, analysis and archiving system												
3.1	Set-up of the hydrometeorological data collection, processing and archiving automated system	175000	43750	43750	43750	43750						
		250000	62500	62500	62500	62500						
3.2	Transformation of the hard copy observation data information into	17500	4375	4375	4375	4375						
		25000	6250	6250	6250	6250						

33	the electronic copy version											
	Set-up of the high-resolution satellite meteorological information receipt (HRPT) to provide reliability and accuracy of the weather forecast, environmental monitoring, snow reserves condition assessment, vegetation state and water resources and glaciers dynamic state.	455000									455000	
		650000									650000	
TOTAL:		647500	48125	48125	48125	48125					455000	
		925000	68750	68750	68750	68750					650000	
4 Improvement of the forecast and service providing system												
4.1	Development and integration of the advanced methods of short-term, mid-term and long-term meteorological, agrometeorological, hydrological and other forecasting	52500	17500	17500	17500							
		75000	25000	25000	25000							
4.2	Integration of the advanced methods of the mean monthly/seasonal temperature and precipitation forecast according to the regions of the Republic	52500						17500	17500	17500		
		75000						25000	25000	25000		
4.3	Integration of the advanced methods of the agrometeorological forecasting to identify agriculture crops vegetation	35000						11600	11800	11600		
		50000						16600	16800	16600		
4.4	Development and integration of the advanced methods of Republic's river water content through application of the mountainous snow cover data (i.e. itinerary avia-remote snow reserves measurement shooting and photographing; satellite information receipt)	157500	78750	78750								
		225000	112500	112500								
4.5	Set-up of the state accounting unique system of the national water resources, their quality and use	140000	14000	14000	14000	14000	14000	14000	14000	14000	14000	14000
		200000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
4.6	Elaboration of the long-term hydrometeorological safety strategy of the Republic Tajikistan and improvement of the information system through reliable and accurate data providing on weather and climate change conditions on the territory of the Republic.	35000						17500	17500			
		50000						25000	25000			
4.7	Set-up of the extreme weather events database	75000	25000	25000	25000							
		26250	8750	8750	8750							
4.8	Improvement of the assessment methods of the weather and climate change condition (including SWE) adverse impacts on the vulnerable sectors of the national economy	37500	12500	12500	12500							
		26250	5250	5250	5250	5250	5250					
4.9	Identification of all climatic, agroclimatic and hydrological resources of the Republic and ways of the extreme weather events dissemination	37500	7500	7500	7500	7500	7500					
TOTAL:		525000	124250	124250	74600	66050	48350	31500	14000	14000	14000	14000
		825000	202500	202500	131600	94300	69100	45000	20000	20000	20000	20000
5 Renovation and the regular conduction of the research and expeditionary works												
5.1	Aerovisual and itinerary observations of the pasture vegetation, agriculture crops vegetation and monitoring of the mudflow and avalanche hazardous regions	175000	17500	17500	17500	17500	17500	17500	17500	17500	17500	17500
		250000	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000
5.2	Reconstruction of the snow and glacial resources monitoring system, enlargement of the snow observation network, providing equipment for the snow cover automated measurement; conduction of the glaciers	87500	8750	8750	8750	8750	8750	8750	8750	8750	8750	8750
		125000	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500

	inventory											
53	Reconstruction of the observation network system of the mountainous outburst lakes	87500	8750	8750	8750	8750	8750	8750	8750	8750	8750	8750
		125000	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500
54	Conduction of the researches of the climate change study	50000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
55	Capacity building of the climate observation system, in particular: - Providing reliability and accuracy of the observations in accordance with the appropriate requirements; - Observations of other environmental factors that cause climate change; - Climatic data collection and the analysis system development; - Participation in GCOS and providing regular climatic data to its branch centers	35000	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
		50000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
56	Preparation and implementation of the greenhouse gas reduction projects	25000	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
57	Conduction of the researches in area of the renewable energy resources use in Tajikistan	25000	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
58	Providing the national economy branches with the climatic data	25000	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
	TOTAL:	385000	38500	38500	38500	38500	38500	38500	38500	38500	38500	38500
		675000	67500	67500	67500	67500	67500	67500	67500	67500	67500	67500
6	Raising the personnel and specialists' qualification											
61	Raising the personnel and specialists' qualification through the training courses arranged by the WMO Regional Meteorological Training Centers (RMTC)	300000	30000	30000	30000	30000	30000	30000	30000	30000	30000	30000
62	Training the specialists at the colleges and high schools of the CIS and foreign countries	600000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000
	TOTAL:	900000	90000	90000	90000	90000	90000	90000	90000	90000	90000	90000
	TOTAL:	9135000	956875	1424375	1029725	835725	1154900	1129400	633500	528500	633500	808500
		14350000	1328750	1853750	1432850	1416350	1872400	1835900	1127500	977500	1127500	1377500
	GRANDTOTAL:	23485000	2285625	3278125	2462575	2252075	3027300	2965300	1761000	1506000	1761000	2186000