**Report**

of

Training Program

on

## 

**“Hydrodynamic Modeling using HEC RAS”**

**(Organized under National Hydrology Project)**

**Aug 23-27, 2021**

***Organized by***



**National Institute of Hydrology,**

**Jal Vigyan Bhavan, Roorkee**

**Report of Training organized under NHP from Aug 23-27, 2021**

The 5-days training course on ‘Hydrodynamic Modeling using HEC RAS’ was organized by the National Institute of Hydrology and Central India Hydrology Regional Centre, Bhopal during Aug 23-27 2021. The training was organized online on the Webex platform and coordinators of the course were Dr. A. K. Lohani, Sc-G, and Dr. R . K. Jaiswal Sc-E, CIHRC, NIH Bhopal. The objectives of the training course were to demonstrate the theory of flood modeling, practices, practical training, innovations, and case studies with particular reference to dam break and flood inundation mapping for the officers of various implementing agencies under the National Hydrology Project.

The training course was organized under National Hydrology Project a flagship program of the Ministry of Jal Shakti, GOI. The development objective of the NHP for India is to improve the extent, quality, and accessibility of water resources information and to strengthen the capacity of targeted water resources management institutions in India. The resource persons from NIH Roorkee and NIH Regional Centre, Bhopal were delivered different lectures and tutorials for the participants. The training program has received an overwhelming response from the participants. Total 62 participants were registered for the training program, out of which 42 participants were found eligible for the course. The list of participants who successfully attended maximum lectures, submitted tutorials and quizzes are given in Annexure-I.

The training program began with the inaugural session hosted by Dr. A.K. Lohani, Scientist G & Training Coordinator, NIH. Dr. Sanjay Kumar Jain, Sc-G & Head PDS NIH delivered the inaugural address. The resource persons from NIH Dr. R. K. Jaiswal, Sc-D, Dr. J. P. Patra, Sc-E, and Sri Sukant Jain, Research Scientist along with participants from different states were present in the inaugural session through online mode.

During the training course number of lectures and practical exercises were taken by experts and resource person on important topics such as the theory of hydrodynamic modeling, flood plain mapping, flood frequency modeling, basics of GIS, georeferencing, vector layer creation and editing, terrain analysis DEM and contour creation, introduction of HEC RAS, 1-D steady and unsteady flow modeling, 2-D steady and unsteady modeling, 2-D mesh creation, boundary condition, weir & culvert analysis, terrain modification, dam-break modeling, preparation of emergency action plan, etc. The training schedule is given in Annexure-II.

After the number of thoughtful and meaningful interactive sessions during five days of the training course, the concluding Valedictory Function was organized on Aug 27, 2021. Sh. R.K. Jaiswal, Scientist D, NIH, RC Bhopal highlighted the cooperation extended by NIH and participants from different states in organizing the training course. There was a free exchange of views and ideas by all the participants who stressed the need for organizing such workshops regularly so that they can be at par with the know-how of the practitioner’s approach in the field. Training Certificates to the participants were distributed by email.

The Feed Back about the training course was obtained from the participants for Course Evaluation. Almost all participants are satisfied with the program and they also suggested conducting more topic-based training programming in the future. The detailed feedback report is given in Annexure III. Some screenshots of the training program are given in Annexure IV.

**HYDRODYNAMIC MODELLING USING HEC- RAS (Aug 23-27, 2021)**

***List of Participants***

***Annexure-I***

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Name** | **Designation** | **Department Name** |
| 1 | Mr. Ajay Kumar | Superintending Engineer | Irrigation Department, Government of Uttarakhand |
| 2 | Mr. Akash Sharma | IT Specialist | Irrigation & Public Health Department, Government of Himachal Pradesh |
| 3 | Mr. Ambrish Kumar | Junior Engineer | Water Resources Department, Government of Jharkhand |
| 4 | Ms. Ananya Gupta | Assistant Engineer | Water Resources Department, Government of Chattishgarh |
| 5 | Mr. Anil Aswale | Assistant Engineer | Water Resources Department, Government of Chattishgarh |
| 6 | Mr. Anmol Bhardwaj | Junior Engineer | Bhakra Beas Management Board (BBMB) |
| 7 | Mr. Arnab Jan Deka | Research Assistant | Water Resources Department, Government of Assam |
| 8 | Mr. Budharapu Subhashini | Assistant Executive Engineer | Water Resources Department, Government of Andhra Pradesh |
| 9 | Mr. Gazi Md. Tarfazur Rahman | Assistant Engineer | Water Resources Department, Government of Assam |
| 10 | Mr. Mohammad Danis Khan | Hydrogeologist | Central Ground Water Board (CGWB) |
| 11 | Mr. Naveen | Superintending Engineer | Irrigation Department, Government of Uttarakhand |
| 12 | Mr. Neeraj Chauhan | Assistant Director | Bhakra Beas Management Board (BBMB) |
| 13 | Mr. Nohar Singh Dhruv | Junior Engineer | Water Resources Department, Government of Chattishgarh |
| 14 | Prasad Prabhakar Kulkarni | Junior Engineer | Water Resources Department, Government of Maharashtra |
| 15 | Ms. Rashmi | Assistant Engineer | Water Resources Department, Government of Karnataka |
| 16 | Mr. Solamon T George | Assistant Engineer | Irrigation Department, Government of Kerala |
| 17 | Mr. Suresh Bhima Bhange | Junior Engineer | Water Resources Department, Government of Maharashtra |
| 18 | Mr. Vikas Kumar Dubey | Assistant Engineer | Water Resources Department, Government of Chattishgarh |
| 19 | Mr. Yogesha M | Assistant Engineer | Water Resources Department, Government of Karnataka |

***Annexure-II***

***Training Schedule***

**HYDRODYNAMIC MODELLING USING HEC- RAS (Aug 23-27, 2020)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Date & Day** | **Time** | **Topic** | **Faculty** |
| **DAY 1-**  **Aug 23, 2021**  **Monday** | 1030 hrs-1100 hrs | Introduction and inaugural |  |
| 1100 hrs-1200 hrs | Modeling in HEC-RAS | RKJ |
| 1200 hrs-1300 hrs | Flood Plain Modelling | SKJ |
| 1300 hrs- 1400 hrs | LUNCH | |
| 1400 hrs-1500 hrs | Flood Frequency Analysis | AKL |
| 1500 hrs.-1600 hrs. | Creation of database in GIS | SJ, SKJ |
| **DAY 2-**  **Aug 24, 2021**  **Tuesday** |
| 1100 hrs-1200 hrs | Open data sources | SJ |
| 1200 hrs-1300 hrs | Hands-on Training GIS Software (Arc GIS): delineation of catchment | SJ, SKJ |
| 1300 hrs- 1400 hrs | LUNCH | |
| 1400 hrs- 1500 hrs | Hands-on Training GIS Software (Arc GIS): delineation of catchment | SJ, SKJ |
| 1500 hrs- 1600 hrs | HEC-RAS 1 D Steady Flow –River network creation | AKL, RKJ, JPP |
| **DAY 3- Aug 25, 2021**  **Thursday** | 1100 hrs-1200 hrs | HEC-RAS 1 D Steady Flow - River network creation | AKL, RKJ, JPP |
| 1200 hrs-1300 hrs | HEC-RAS 1 D Steady Flow - Boundary conditions and simulation run | AKL, RKJ, JPP |
| 1300 hrs- 1400 hrs | LUNCH |  |
| 1400 hrs- 1500 hrs | HEC-RAS 1 D Steady Flow - Boundary conditions and simulation run | AKL, RKJ, JPP |
| 1500 hrs- 1600 hrs | HEC-RAS 1 D Unsteady Flow Simulation | AKL, RKJ, JPP |
| **DAY 4- Aug 26, 2021**  **Thursday** | 1100 hrs-1200 hrs | HEC-RAS 2 D Steady Flow - River network creation | JPP, RKJ, AKL |
| 1200 hrs-1300 hrs | HEC-RAS 2 D Steady Flow - River network creation | JPP, RKJ, AKL |
| 1300 hrs- 1400 hrs | LUNCH |  |
| 1400 hrs- 1500 hrs | HEC-RAS 2 D Steady Flow - Boundary conditions and simulation run | JPP, AKL, RKJ |
| 1500 hrs- 1600 hrs | HEC-RAS 2 D Steady Flow - Boundary conditions and simulation run | JPP, AKL, RKJ |
| **DAY 5- Aug 27, 2021**  **Friday** | 1100 hrs-1200 hrs | HEC-RAS 2 D Steady Flow - structures, bridges etc.-I | RKJ, JPP, AKL |
| 1200 hrs-1300 hrs | HEC-RAS 2 D Steady Flow - structures, bridges etc.-II | RKJ, JPP, AKL |
| 1300 hrs- 1400 hrs | LUNCH | |
| 1400 hrs- 1500 hrs | Dam Break Flood Analysis | RKJ, AKL, JPP |
| 1500 hrs- 1600 hrs | Emergency Action Plan | RKJ, AKL, JPP |

SKJ-Dr S.K. Jain, AKL- Dr A.K. Lohani, JPP-Dr J.P.Patra, RKJ-Dr R.K. Jaiswal, SJ-Mr Sukant Jain,



***Annexure-III***

***Training on Hydrodynamic Modeling Using HEC RAS***

***Feedback from Participants***

Hydrodynamic Modelling using HEC RAS

from 23-27 Aug, 2021 (Course evaluation)

14 responses

Overall view of the Training Course

15

Very Useful Useful Useful to some extent

10

5

0

Overall view of the Training Course

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15

Very Useful Useful Useful to some extent

10

5

0

Your impression about lectures/Tutorials delivered in the training course.

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| --- | --- | --- | --- | --- |
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What do you feel about the duration of the course?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Too Long |  | Suffi | ci | ent |  | Too Short |

10

5

0

What do your feel about the duration of the course?

15

Disagree Neutral Agree

10

5

0

Instructor was an effective

lecturer/demonstrator

Presentations/Tutorials were clear and organized

Instructor was available and helpful



Course content

15

Disagree Neutral Agree

10

5

0

Learning objectives were clear Course content was organized and well planned

Specific comments about topics covered under the course and its relevance to the training course. (Feel free to offer constructive criticism).

9 responses

All the topics covered under this course are very clear and usefull.

The topics are very useful and practical. We will definitely use this in topics in our field.

Overall is too good

Very appropriate and adequate. But need more time at slow pace to understand all the topics and hands on exercises

We want to do this hydraulics modelling in our river streach. Pl include examples, which covers all site conditions

this online training should be repeated after one month for better understand

If possible hec geo ras should also included.

we may take some more real life examples, instead of academia centric.

Will this training help you in your professional activities? If so elaborate. If not indicate how the course requires to be modified to your requirement.

12 responses

Definitely it helps a lot

Bank line flow path, velocity profile, steady unsteady discharge.

Yes, with the learning from this course i will definitely able to do my work/analysis/design in more concisely manner within the time alloted.

Yes the this training help to enhance my professional activities for doing hydraulics analysis for my future projects and work. I'm satisfied with this course very much.

Yes, absolutely use for current working as well as future work

This training will be very useful in my professional governmental duties. But, I need more elaborate physical training with longer duration to understand all the steps, so that practical applications of the knowledge is possible during my actual laboratory work at office.

I was not able to attend all sessions due to other urgent official responsibilities. It

Your views about floating such course again in future for the benefit of your colleagues.

12 responses

I will surely recommend this training to all my colleagues and friends

Excellent

Yes, in future this course may be conducted with the more applications/advanced. Yeah definitely i'll join again this type of training in future and share this to others. Sure float in future

Will be very useful for my junior research engineer colleagues.

It will be useful to everyone if recordings were available. As far as I know, it does not involve any additional cost.

Yes it is essential yes

Any Topics which should be cover in this training

9 responses

Na

No, this course is framed very planned and optimum manner for initial grasping/exploration with the learning or practicings with the software (HEC-RAS) on Hydrodynamic Model.

Complete dam break analysis step by step.

I am freshly learning this software, so as per my knowledge is ok, if Any topic required in future I surely contact you, for floating course in future with including newly topic

Dam break & Erosion Analysis

Pl give training based on a particular river basin covering all conditions

3 d modelling

Hec geo ras

Any other suggestion/observations on this course.

10 responses

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***Annexure-IV***

***Training on Hydrodynamic Modeling Using HEC RAS***

***Photographs***











