**Severe Weather Forecasting Demonstration Project (SWFDP)**

**Regional Sub-projects for Southeast Asia (SeA)**

**Training Workshop on**

**Severe Weather and Impact Based Forecasting and Warning Services**

(Vientiane, Lao PDR, 19 February - 1 March 2019)

**Provisional Programme for Week-1**

**(19-23 February 2019)**

**Aims**

* To develop a consistent interpretation of global and convective scale models output for use in forecasting severe and high impact weather in Southeast Asia.
* To learn basic verification techniques to assess model/products skills
* To develop capacity on satellite information analysis and Nowcasting tools to improve Nowcasting skill for better monitoring and early warning services
* To train the trainers who are expected to impart training to their fellow forecasters in their home countries

**Outputs**

At the end of the week, learners will have improved their knowledge of satellite Nowcasting tools. Moreover, they will be able to appreciate NWP model strengths and weaknesses, and will have gained experience in using the tools and model outputs to improve forecasting of severe and high impact weather. Learners will also be able to run basic verification of the forecast products made available to them.

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| **Resource Persons/Lecturers**   * Anna Ghelli – ECMWF * Masami Narita – JMA * Koichiro Kakihara – JMA * Wai-Kin Wong – HKO * Du Duc Tien – RFSC * Ata Hussain – WMO Secretariat | **Daily Health Breaks**  A.M. Tea/Coffee: 10:30-11:00 hours  Lunch Break: 12:30-13:30 hours (except on Day 2, shorter lunch break)  P.M. Tea/Coffee: 15:30-16:00 hours |

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| **Day 1: Tuesday, 19 February 2019** | | |
| ***Morning Session*** | | |
| 09:00-09:30 | Registration | All |
| 09:30-10:00 | **Opening of the Training Workshop**   * Welcome remarks by the local host and WMO * Group photo | DHM-Lao PDR  Ata Hussain (WMO)  All |
| 10:00-10:20 | **Strengthening capacity of NMHSs in improving forecasts and warnings through SWFDP** | Ata Hussain |
| 10:20-10:30 | **SWFDP-SeA Training Workshop programme and objectives** | Ata Hussain |
| 11:00-11:30 | **SWFDP-SeA Website and portal (RFSC Ha Noi)** (Interactive Demo) | Du Duc Tien |
| 11:30-12:30 | **POSTERS and Group activity** - National forecasting capacity and verification activities at NMHSs  (Cambodia, Lao PDR, Philippines, Thailand and Viet Nam)   1. **POSTERS:** prepare a poster describing national forecasting capacity and verification activities at your NMHS 2. **Essay on ‘Severe weather forecasting – the forecast process’**   Group activity - two minutes (1 slide) for each country to highlight key points followed by general  Guidance for essay: please think about a severe weather event for which you had to provide a forecast. This is sometime a daunting task!  Describe briefly the event. Think about the forecasting process you followed and describe it. What were the weaknesses/gaps you encountered? Some of the topics you may want to consider are: clarity of task, user interface/communication, forecast confidence/uncertainty and predictability.  ------------------------------------  Please upload your essay (including your name) by **11th February 2019**. | All trainees  Anna Ghelli (to facilitate) |
| ***Afternoon Session*** | | |
| 13:30-13:45 | **Weather briefing and discussion** | DHM-Lao PDR |
| 13:45-14:45 | **Flipped classroom: Ensemble forecasting**  Group activity  Important Note: Participants centred class. We will discuss concepts presented in the eLearning module and review the questionnaire:  https://www.ecmwf.int/assets/elearning/ensemble/ens1/story\_html5.html  Questions (after completing the module):   * Why do you think forecasts can go wrong? * How does ensemble forecasting address (or does not address) the reasons for 'providing wrong forecasts' you have outlined above? * What is the EDA? * What constitutes a 'good' ensemble forecast? * What is the set up of the ECMWF Ensemble forecasting system?   Please upload your answers on shared Google Drive by the **11th February 2019**. Please make sure to add your name on the document before uploading. | All trainees  Anna Ghelli (to lead)  other lecturers (to assist) |
| 14:45-15:30 | **Game (Probability)**  (The participants will be able to make better use of the probability forecasts through understanding its relevance and importance in decision making ) | All trainees  Anna Ghelli (to instruct) |
| 16:00-17:00 | **Verification of forecasts and warnings** | Wai-Kin Wong |
| 17:00-17:30 | **Recent validations for tropical cyclone effecting to Vietnam** | Du Duc Tien |

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| **Day 2: Wednesday, 20 February 2019** |
| ***Morning Session*** |

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| 09:00-09:45 | **Flipped Classroom – Extreme Forecast Index (EFI) and Shift of Tails (SOT) index**  Important Note: Participants are requested to go through the following e-learning module:  <https://www.ecmwf.int/assets/elearning/efi/efi1/story_html5.html>  This must be completed by the **11th February 2019** | All trainees  Anna Ghelli (to instruct)  other lecturers (to assist) |
| 09:45-10:30 | **EFI and SOT index in practise**  We will be looking at severe weather events using EFI/SOT and related products.  (trainees will be split into groups) | All trainees (trainees will be split into groups)  Anna Ghelli (to instruct)  Other lecturers (to facilitate) |
| 11:00-12:30 | **Basic of satellite analysis including introduction of tools** | TBD-JMA (to instruct) |
| 12:30-13:00 | **Regional NWP LAM and RFSC Guidance Product**   * RFSC Ha Noi NWP LAM products and future directions * Guidance product for short- and Medium-range, Confidence level: how to quantify with examples, Interpretation and use of guidance product | Du Duc Tien |

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| ***Afternoon Session*** |

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| 13:30-13:45 | **Weather briefing and discussion** | DMH-Lao PDR |
| 13:45-17:30  (including tea break) | **Satellite Nowcasting tool and techniques-Case study 1** (such as typhoon, heavy rain in Southeast Asia)   **Practical work:** How to analyze satellite images | JMA-TBD |

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| **Day 3: Thursday, 21 February 2019** |
| ***Morning Session*** |

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| 09:00-12:30  (including tea break) | **Satellite Nowcasting tools and techniques - Case study 1** (such as typhoon, heavy rain in Southeast Asia)   **Practical work:** How to make forecast scenarios using the result of analysis and other products | JMA-TBD |

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| ***Afternoon Session*** |

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| 13:30-14:30 | **Tour to DMH Forecasting Office and weather briefing** | DMH-Lao PDR /All |
| 14:30-15:00 | **Post-processing of NWP products in high impact weather forecasting** | Wai-Kin Wong |
| 15:00-17:30  (including tea break) | **Training on ECMWF ecCharts tool** (including inter. demo) | Anna Ghelli |

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| **Day 4: Friday, 22 February 2019** |
| ***Morning Session*** |

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| 09:00-12:30  (including tea break) | **Satellite Nowcasting tools and techniques - Case study 2** (such as typhoon, heavy rain in Southeast Asia)   **Practical work:** How to analyze satellite images | JMA-TBD |

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| ***Afternoon Session*** |

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| 13:30-13:45 | **Weather briefing and discussion** | DMH-Lao PDR |
| 13:45-17:30 | **Satellite Nowcasting tools and techniques - Case study 2** (such as typhoon, heavy rain in Southeast Asia)   **Practical work:** How to make forecast scenarios using the result of analysis and other products | JMA-TBD |

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| **Day 5: Saturday, 23 February 2019** |
| ***Morning Session*** |

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| 09:00-10:30 | **Nowcasting products and support from HKO (RSMC for Nowcasting) perspective**  Use and interpretation (including inter. demo) | Wai-Kin Wong |
| 11:00-11:30 | **Satellite Nowcast products for significant convection analysis and forecasting** (with practical) | Wai-Kin Wong |
| 11:30-12:30 | **Combining Nowcast, NWP forecast & conceptual model** (including examples for heavy rain etc.) | Wai-Kin Wong |

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| ***Afternoon Session*** |

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| 13:30-14:00 | **Brainstorming on impact based forecasting**  (value adding process) | Ata Hussain |
| 14:00-14:30 | **Conclusion – actions and planning** | Ata Hussain |
| 14:30-14:45 | **Complete Questionnaire on assessment of training workshop week-1** | All trainees (to complete) |
| 14:45-15:00 | **Closing** | DMH-Lao PDR  WMO/ All |