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## NASA ARSET Air Quality Remote Sensing Training

Organized by:

NASA's Applied Remote Sensing Training Program (ARSET); the Indonesian Agency for Meteorological, Climatological, and Geophysics (BMKG); and the U.S. Embassy, Jakarta

Tuesday, March 20 – Friday, March 23, 2018

BMKG Headquarters, Jalan Angkasa I, No. 2, Kemayoran, Jakarta

Key = Key = **LC**: Lecture, **HO**: Hands-On Exercise, **DM**: Demonstration, **PP**: Participant Presentation, **DS**: Discussion

Instructors: Pawan Gupta, Melanie Follette-Cook, and Bryan Duncan

### Tuesday, March 20, 2018

Day 1, Morning Session: Registration, Opening Remarks, and Introduction and First Exposure to Satellite Air Quality Measurements

	Time	Topic	Format
BMKG	08:30 – 09:00	Registration & Logistics	Informal
BMKG	09:00 – 09:45	Opening Ceremony	
	09:45 – 10:00	Photo Session	
	<b>10:00 – 10:30</b>	<b>Tea Break</b>	
BMKG	10:30 – 11:00	Overview of the Indonesian Air Quality Monitoring Program and Future Directions	LC, DS
Pawan, D1P1	11:00 – 11:30	Introduction of ARSET Program and Overview of Satellite Capabilities for Air Quality Monitoring	LC, DS
Melanie, D1P2	11:30 – 12:30	Fundamentals of Satellite Remote Sensing	LC, DS
	<b>12:30 – 13:30</b>	<b>Lunch Break</b>	



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#### Day 1, Afternoon Session: Satellite Imagery, Data Formats, and Access

	Time	Topic	Format
Pawan, D1P3	13:30 – 13:45	Satellite Data Products, Levels, and Format	LC, DS
Melanie, D1P4, D1P4E	13:45 – 14:45	Satellite Imagery of Dust, Smoke, and Pollution: Access, Interpretation, and Tools	LC, DM, HO
Pawan, D1P5E	14:45 – 15:00	Level 2 Aerosol Products: Data Access	HO
Pawan, D1P6E	15:00 – 16:00	Level 3 Aerosol Products: Data Access & Analysis	HO, DS, PP
	<b>16:00</b>	<b>Day 1 Adjourn</b>	

#### Wednesday, March 21, 2018

#### Day 2, Morning Session: Satellite Aerosol Data, Tools, and Applications

	Time	Topic	Format
	08:30 – 08:45	Q&A, Review of Day 1, Logistics	
Pawan, D2P1	8:45 – 10:00	Satellite Aerosol Products: Evaluation, Applications, and Limitations	LC, DS, HO
	<b>10:00 – 10:15</b>	<b>Tea Break</b>	
Melanie, D2P2, D2P2E	10:15 – 11:15	Satellite Aerosol Products: Evaluation, Applications, and Limitations	LC, DS
Pawan, D2P3E	11:15 – 11:45	Explore Level 2 MODIS Aerosol Data (10 km and 3 km) in Panoply	HO
Pawan, D2P4	11:45 – 12:30	Theoretical Basis for Converting Satellite Observations to Ground-Level PM <sub>2.5</sub> Concentrations	LC, DS
	<b>12:30 – 13:30</b>	<b>Lunch Break</b>	



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#### Day 2, Afternoon Session: Satellite Aerosol Data, Tools, and Applications

	Time	Topic	Format
Pawan, D2P5E	13:30 – 14:30	Reading and Mapping MODIS Level 2 Aerosol Datasets & PM <sub>2.5</sub> in Python	HO
Pawan, D2P6E, D2P6_data	14:30 – 15:00	Conversion of Satellite Aerosol Measurements to PM <sub>2.5</sub> Air Quality	HO, PP
Bryan, D2P7	15:00 – 15:45	Satellite-Based PM <sub>2.5</sub> Datasets and Access	DM, HO
	15:45 – 16:00	Q&A, Review	
	<b>16:00</b>	<b>Day 2 Adjourn</b>	

#### Thursday, March 22, 2018

#### Day 3, Morning Session: Trace Gases & Fire Products

Material No.	Time	Topic	Format
	08:30 – 08:45	Q&A, Review of Day 2	
Melanie, D3P1, D3P1E	8:45 – 10:00	Satellite-Based Fire Products	LC,HO
	<b>10:00 – 10:15</b>	<b>Tea Break</b>	
Bryan, D3P2	10:15 – 11:15	Satellite Remote Sensing of Trace Gases	LC, DS
Bryan, D3P2E	11:15 – 12:30	Trace Gas Data Access, Tools, & Analysis	HO, DS
	<b>12:30 – 13:30</b>	<b>Lunch Break</b>	

#### Day 3, Afternoon Session: Vertical Profiles and Reanalysis

Material No.	Time	Topic	Format
Melanie, D3P3	13:30 – 14:30	CALIPSO and CATS	LC, DS, HO
Pawan, D3P4	14:30 – 15:15	Near Real-Time (NRT) Volcanic SO <sub>2</sub> , Himawari, and the MERRA-2 Reanalysis	LC, DS, HO
Bryan, D3P5	15:15 – 15:30	Future Satellite Missions for Air Quality Monitoring	LC, DS
	15:30 – 15:45	Air Quality Case Study Groups and Discussion	DS
	15:45 – 16:00	Discussion, Q&A, and Review of Days 1, 2, and 3	
	<b>16:00</b>	<b>Day 3 Adjourn</b>	



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**Friday, March 23, 2018**

Day 4, Session: Air Quality Case Studies by Participants

Material No.	Time	Topic	Format
	08:00 – 08:30	Additional Tools and Resources for Case Studies	LC, DM
D4CS	08:30 – 10:30	Case Study Analysis in Groups	HO
	10:30 – 11:30	Case Study Presentations and Discussion	PP
	11:30 – 13:00	Lunch Break	
	13:00 – 13:30	Training Review, Feedback, and Moving Forward	HO, DS
	13:30 – 13:45	Closing Remarks by Director of Center for Applied Climate Information Services	
	<b>13:45</b>	<b>Day 4 Adjourn</b>	