MWM 2018

The MWM program provides middle and high school mathematics and science teachers an opportunity to discuss and apply the data analysis and statistical concepts embodied in the *Common Core Standards for Mathematics (CCSSM),* the American Statistical Association's (ASA) *Guidelines for Assessment and Instruction in Statistics Education (GAISE) Pre-K-12 Curriculum Framework*, and the *BC Mathematics Curriculum*. Teachers will examine the Mathematical Practices of the CCSSM from a statistical point of view and study ways to assess student understanding of statistical concepts. Teachers will explore problems that require them to formulate statistical questions, collect, organize, analyze, and draw conclusions from data. The MWM program includes examining what students can be expected to do at the most basic level of understanding data analysis and what can be expected of them as their skills develop and experience broadens.

Program Chair: Katherine T. Halvorsen, Department of Mathematics & Statistics, Smith College

HIGH SCHOOL PROGRAM – DAY 1
Schedule for Grades 9-12 Workshops
Tuesday, July 31, 2018

8:00 – 8:30	Teachers arrive and register for MWM. Coffee and pastries available.
8:30 – 8:45	Welcome by Katherine Halvorsen, MWM Program Chair, Ron Wasserstein, ASA Executive Director, Rebecca Nichols, ASA Director of Education, and representatives from the local chapter of the ASA and Statistical Society of Canada
8:45 - 9:15	Overview: Christine Franklin: GAISE Pre-K–12 Report; Statistics Education for Teachers (SET) Report; and Statistics and Probability in the Common Core State Standards for Middle and High School Mathematics and BC Mathematics Curriculum
9:15 - 10:45	Session 1: Katherine Halvorsen, Formulating statistical questions and recognizing the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each. *(Common Core Standards High School S-IC.B. 3 & 6, BC statistics standards)*
10:45 - 11:00	Break with snacks and coffee
11:00- 12:30	Session 2: Anna-Marie Fergusson, Recognizing data types and the appropriate methods for displaying, summarizing, and comparing them. Using the Normal distribution as a measure of extremeness. (*Common Core Standards for High School S-ID.A.1-4, BC statistics standards*)
12:30 - 2:00	Lunch on your own.
2:00 - 3:30	Session 3: Anna-Marie Fergusson, Using randomization tests to make inferences & justify conclusions. (*Common Core Standards for High School S-IC.B.5, BC statistics standards*)
3:30 - 4:00	Evaluation and Reflection

MIDDLE SCHOOL PROGRAM – DAY 1
Schedule for Grades 5-8 Workshops
Tuesday, July 31, 2018

8:00 – 8:30	Teachers arrive and register for MWM. Coffee and pastries available.
8:30-8:45	Welcome by Katherine Halvorsen, MWM Program Chair, Ron Wasserstein, ASA Executive Director, Rebecca Nichols, ASA Director of Education, and representatives from the local chapter of the ASA and Statistical Society of Canada.
8.45 - 9:15	Overview: Kaycie Maddox: GAISE Pre-K–12 Report; Statistics Education for Teachers (SET) Report, and Statistics and Probability content in the Common Core State Standards for Middle and High School Mathematics and statistics standards in the BC Mathematics Curriculum.
9:15 - 10:45	Session 1: Kaycie Maddox, Statistical Questions and Methods for Collecting Data (*Common Core Standards 6.SP.1, BC statistics standards*).
10:45 - 11:00	Break
11:00 - 12:30	Session 2: Kaycie Maddox, Comparative inferences about two populations – Census at School and Memory Test (*Common Core Standards 7.SP.3 and 4, and S-ID.2, BC statistics standards*)
12:30 - 2:00	Lunch on your own
2:00 - 3:30	Session 3: Christine Franklin, Investigating patterns of association in bivariate categorical data. Dependent and independent events. Compare middle school with high school expectations (*Common Core Standards 8.SP. 4 and S-ID.5, BC statistics standards)*
3:30 - 4:00	Evaluation and Reflection

JOINT HIGH SCHOOL AND MIDDLE SCHOOL PROGRAM – DAY 2
Schedule for Grades 5-12 Workshops
Wednesday, August 1, 2018

8:00-8:30	Teachers arrive. Coffee and pastries available.
8:30-10:00	Session 1: Christine Franklin, Measure of Center and Variability (MAD) (*Common Core Standards 6.SP.2, 3, 4,and 5, BC statistics standards*) .
10:0010:15	Break
10:15-11:45	Session 2: Christine Franklin, Investigating Sampling Variability: Gettysburg Address (*Common Core Standards 7.SP.1 and 2, BC statistics standards*).
11:45-1:15	Lunch on your own
1:15-2:45	Session 3: Kaycie Maddox, Investigating patterns of association in bivariate quantitative data. Compare middle school with high school expectations (*Common Core Standards 8.SP.1, 2, 3, and S-ID.6,7,8, BC statistics standards)*
2:45-3:00	Break
3:00-3:45	Session 4: Connie Schrock (NCSM President), Statistics as a tool for Access and Equity – Leading students to use statistics to change and improve their world
3:45-4:00	Evaluation and Reflection

Presenters:

Anna Fergusson currently teaches introductory-level statistics at the University of Auckland. Before this, she was Head of Department (Mathematics and Statistics) at the second largest high school in New Zealand. Anna is interested in statistical education, in particular curriculum and assessment design, and enjoys facilitating workshops to support professional development of statistics teachers. She is currently undertaking a PhD exploring how to integrate data science within the high school statistics curriculum. Anna is a senior member of the New Zealand Statistical Association (NZSA) education committee and is involved with the international collaboration between the NZSA and the ASA-NCTM joint committee for statistics education. She has also worked with the New Zealand Ministry of Education and the New Zealand Qualifications Authority on the development of national curriculum, assessment standards, tasks and teaching resources for statistics. Anna thinks teaching and learning statistics and data science is awesome and runs a blog for statistics teachers called *teaching statistics is awesome*.

Christine (Chris) Franklin is the K-12 Statistics Ambassador for the American Statistical Association and elected ASA Fellow. She is retired from the University of Georgia as the Lothar Tresp Honoratus Honors Professor and Senior Lecturer Emerita in Statistics. She is the co-author of two Introductory Statistics textbooks and has published more than 50 journal articles and book chapters. Chris was the lead writer for the groundbreaking document of the American Statistical Association *Pre-K-12 Guidelines for the Assessment and Instruction in Statistics*

Education (GAISE) Framework and chaired the writing team of the ASA *Statistical Education of Teachers (SET)* report. She is a past Chief Reader for Advance Placement Statistics, a Fulbright scholar to New Zealand (2015), and recipient of the United States Conference on Teaching Statistics (USCOTS) Lifetime Achievement Award and the prestigious ASA Founder's award. Chris loves running, hiking, and scoring baseball games.

Katherine Halvorsen teaches statistics at Smith College. She began her career teaching mathematics in high schools in Newton, Massachusetts, and in Lusaka, Zambia, before returning to school to earn a doctorate in Biostatistics. She has taught summer workshops for AP Statistics teachers and served on several committees for the College Board including: the AP Statistics Development Committee, the SAT Development Committee, the Mathematical Sciences Academic Advisory Committee, and the Standards Advisory Committee in Mathematics and Statistics. She has served as Program Chair for MWM since 2007. She currently serves on the ASA Board of Directors as a representative for the Council of Sections. She has also served in several other positions for the American Statistical Association, among them Chair of the Council of Sections, Chair of the Advisory Committee on Continuing Education, and Secretary-Treasurer of the Executive Committee for the Section on Statistical Education. She is a Fellow of the American Statistical Association. She received her B.A. from the University of Michigan, MEd from Boston University, MS from the University of Washington, and D.Sc. from Harvard University.

Kaycie Maddox is a 38-year veteran of mathematics education in public schools, currently serving as the Director of High School Mathematics for Northeast Georgia RESA in Athens, Georgia. She has five years of experience teaching middle school mathematics and statistics, twenty-one years at the high school level, and twelve years' experience supporting middle and high school mathematics and statistics teachers in their classrooms. Kaycie holds a Bachelor of Science in Education Degree in Mathematics from Georgia Southern College (1980), a Masters of Education Degree in Mathematics at the University of Georgia (1999), AP Statistics College Board Certification (2000), and National Board Certification in Adult/Young Adult Mathematics (2004). The primary focus of her work is found in coaching pedagogical content knowledge that supports conceptual understanding and skill fluency for students. She is married to Gil Maddox, Jr., and they are blessed with five grown children, two daughters-in-law, and five grandchildren.