HWRS 696F Section 002 *Advanced Topics in Surface Hydrology and Modeling*

Flood Hydrometeorology & Hydroclimatology – Implications for a Future of Global Change and Extreme Hydrology

1-3 units / Tuesdays 5:00 – ~7:30 pm Bannister Tree-Ring Building 424

Instructors: **Katie Hirschboeck [1] & Victor Baker [2]**

[1] Associate Professor of Climatology Laboratory of Tree-Ring Research
with Joint Appointments in: HWRS, ATMO, and School of Geography & Development

[2] Regents Professor, Hydrology & Water Resources, with Joint Appointments
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CLASS WEBAPGE: www.ltrr.arizona.edu/kkh/hwrs/696f.htm

Course Description: This graduate seminar course will focus on the meteorological and climate-related causes of floods, both regionally and globally, and the overarching scientific issues related to floods. After an overview of flood-generating processes, participants will examine and present case studies of a selection of past major flood events in the United States based on published post-flood reports (USGS, NOAA). In tandem with these case studies, we will review and discuss relevant classic and current scientific literature on flood hydrometeorology, hydroclimatology, extreme precipitation events, and flooding & climate change. The semester will also include readings and discussion on the policy and planning implications that emerge from this physically based, climate-linked understanding of the underlying causes of flooding variability. To critically evaluate and apply the knowledge gained, 3-unit participants will complete an individual or class project, such as the analysis of a selected watershed's flood history to assess past, present, and (projected) future climate-related drivers of its floods, a study of the Rillito watershed decades after the 1983 and 1993 floods, a group publication manuscript, etc. Project options will be discussed and agreed upon in class.

Course Objectives:

-- To become familiar with regional and global patterns of flooding and the weather and climate processes that produce them

-- To gain a deeper understanding of the atmospheric and hydrologic causes of floods in specific regions by examining and reporting on case studies of selected floods

-- To review and discuss the relevant classic and current scientific literature on flood hydrometeorology, hydroclimatology, extreme precipitation events, and flooding & climate change

-- To examine and discus the overarching scientific issues related to flood analysis, and the policy and planning implications of flood hazard assessment for present and future flooding

-- To critically examine and apply this information by completing an individual or class project *(3 unit enrollment requirement)*

Prerequisites: Background in the basics of one or more of the following areas: hydrology, meteorology, climatology, geomorphology and/or water resources; plus basic statistics (probability)

Grading Criteria & Expectations: Your grade will be based on *effort* and *performance* in the following areas:

	1-unit	3-unit
(1) Readings & Discussion	50%	33%
(2) Case Study Research & Presentations	50%	33%
(3) Research Project & Presentation	----	34%

Attendance: Required. If unavoidable problems require you to miss a class, arrangements can be made to make-up one absence.

Academic Integrity: A synopsis of the UA's Code of Academic Integrity can be found at: deanofstudents.arizona.edu/policies-and-codes/code-academic-integrity You are to know it, understand it, and adhere to it.

Assigned readings will be linked to the class webpage as password-protected PDFs or as links to items in the U.S.G.S . Publications Warehouse: pubs.er.usgs.gov/ Some USGS files need the DjVu browser plugin available at djvu.org/resources/

VERY TENTATIVE CLASS SCHEDULE

To be updated based on class interests & input!

Wk	DATE	TOPIC	CLASS ACTIVITY
FLOOD GENERATING PROCESSES			
1	Jan 20	Overview of Course	
2	Jan 27	Flood Hydroclimatology, Scale & Climate Change	KKH presentation & discussion
3	Feb 3	Flood Hydrogeomorphology, Paleofloods & Science	VRB presentation & discussion
4	Feb 10	Flash Flood Hydrometeorology	Guest speaker: Bob Maddox
FLOOD CASE STUDIES			
5	Feb 17 *	TBD / Flood Case Study Selections	
6	Feb 24	Flood Case Study Presentations	presentations
7	Mar 3	Flood Case Study Presentations	presentations
8	Mar 10 / 12*	Flood Case Study Presentations	presentations
	Mar 17	*Spring Break*	
"TESTING THE CONVENTIONAL WISDOM" PAST, PRESENT & FUTURE FLOODING: EXTREMES / TRENDS / CLIMATE CHANGE			
9	Mar 24	*Readings & Discussion TBD*	
10	Mar 31	"	
11	Apr 7	"	
FLOOD FREQUENCY ANALYSIS & SCIENCE / POLICY & PLANNING IMPLICATIONS			
12	Apr 14	*AAG meeting / work on project this weeks*	
13	Apr 21	*Readings & Discussion TBD*	
14	Apr 28	"	
15	May 5 (or alt date)	Class Finale: Research presentations & Class Wrap Up	student research presentations

Dates with * - an alternative day, time and/or location may be set up for these dates, agreeable to all

NOTE: Information contained in the course syllabus, other than the grade and absence policies, may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.