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Abstracts

- **Flint Hills Springs.**

Robert S. Sawin and Rex C. Buchanan, Kansas Geological Survey, Lawrence, KS 66047; and Wayne Lebsack, Independent Geologist, Lyons, KS 67554.

Springs are an important component of the Kansas landscape and an aid in understanding the connection between groundwater and surface water and the impact of human activity on the environment. Despite their importance, little information has been collected systematically on springs in Kansas. The Kansas Geological Survey has begun a project that brings together existing information on springs in the State. Using the Flint Hills physiographic region as an example, this paper describes significant and representative springs of the Flint Hills, inventories their location and general water quality, and compares their condition to historical data. In general, water quality and flow rates in Flint Hills springs have remained steady through the years. This is attributed to the lack of cultivation and absence of irrigation, which has likely preserved the native prairie grasses and groundwater conditions.

- **Experiments in Computer-Aided Creativity.**

R. Jones, Physics Department, Emporia State University, Emporia, KS 66801.

A large associative network describing the field of cognitive science has been assembled. The automated search of this network has produced some interesting new ideas.

- **The Algal Genera *Chaetopeltis*, *Oligochaetophora*, and *Polychaetophora* (Chaetopeltidales, Chlorophyta).**

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A study of growth forms of *Chaetopeltis orbicularis* Berthold obtained both in culture and from nature has shown the following: *Chaetopeltis barbata* (Bohlin) Willie, *Polychaetophora lamellosa* W. and G.S. West, and *Oligochaetophora simplex* G.S. West are indistinguishable from forms of germling and juvenile thalli of *C. orbicularis*. *Chaetopeltis megalocystis* Schmidle is also a growth form of an older thallus. These forms are reduced to synonymy within *C. orbicularis*.

- **Perspectives of Licensed and Nonlicensed Anglers Fishing Kansas' First Put-and-Take Rainbow Trout Season.**

Randall D. Schultz, Kansas Department of Wildlife and Parks, P.O. Box 1525, Emporia, KS 66801; and Douglas D. Nygren, Kansas Department of Wildlife and Parks, 512 S.E. 25th Avenue, Pratt, KS 67124.

Telephone interviews of Kansas put-and-take rainbow trout permit holders were conducted to gain information on angler perspectives and to provide base-line data for the first year of the program. Responses were separated by angler age groups (<16, 16-64, and ≥ 65 years old), which allowed nongeneral fishing licensed anglers to be separated from general licensed anglers. Although effort did not differ across age groups, anglers ≥ 65 years old had significantly greater catch rates than those <16 years old. Anglers <16 years old had the highest dissatisfaction rates for rainbow trout catch rates. Catch rates either matched or exceeded the preset goal of 0.5 rainbow trout/h. The program received an overall rating of "good". Anglers ≥ 65 years old were least receptive to changes in the program, but they also gave the highest ratings of program satisfaction.

- **Effect of Hydrogen Bonding Solvents on the Infrared Absorption Band for the Fundamental Vibration of the Carbonyl Group in 1,1,3,3-Tetramethylurea.**

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As is true for other organocarbonyls, the frequency of the fundamental IR absorption band for the carbonyl group (C=O) in tetramethylurea exhibits a solvent induced shift of as much as 33 cm^{-1} in going from nonpolar aprotic to hydrogen bonding media. Such a shift occurs with such dissimilar hydrogen bond donor molecules as the alkanols and chloroforms. A quantitative reaction field model which was applied earlier to the C=O group in acetone now has been extended to the FTIR data for tetramethylurea. In that model the total solvent-induced perturbation energy is resolved into dipolarity and hydrogen bonding components.

- **Kite Aerial Photography For Environmental Site Investigations in Kansas.**

James S. Aber, Earth Science, Emporia State University, Emporia, KS 66801 (aberjame@emporia.edu); Rodney J. Sobieski, Biological Sciences, Emporia State University, Emporia, KS 66801; Donald A. Distler, Biological Sciences, Wichita State University, Wichita, KS 67208; and Matthew C. Nowak, Natural Resources, Ft. Leavenworth, KS 66027.

Aerial photography taken from kites provides a versatile and low-cost method to acquire high-resolution, large-scale imagery for environmental site investigations. Kite aerial photographs (KAP) typically are taken from heights of 50-100 m using light-weight automatic cameras. Pictures may be acquired in vertical and oblique vantages. For accurate mapping, survey markers may be located with differential GPS equipment. Scanning of photography and digital processing allow for resampling, enhancement, and analysis of images.

We have utilized KAP for environmental investigations for two situations: (1) forest cover at Fort Leavenworth military reservation in northeastern Kansas, and (2) stream channel characteristics at Ninnescah Experimental Tract and Natural History Reservation in south-central Kansas. At Fort Leavenworth, oblique KAP views revealed the irregular structure and marked shadow effects within the canopy of upland deciduous forest. This information proved useful for interpreting satellite imagery in connection with a climate-forest study. At the Ninnescah study site, vertical KAP was the basis for accurate mapping of intricate, small meandering stream channels and provided an intermediate level of observation between ground studies and conventional topographic maps, air photos, or satellite images.

- **Egg Parasitism of the Jumping Spider, *Phidippus clarus* (Salticidae) by the Parasitoid Wasp, *Idris saitidis* (Scelionidae).**

Hank Guarisco, P.O. Box 3171 , Lawrence, KS.

A female jumping spider, *Phidippus clarus* Keyserling (Araneae; Salticidae) was discovered guarding an eggsac on herbaceous vegetation on 23 October 1997 at Clinton Lake, Douglas County, Kansas. Laboratory examination of the eggsac revealed the presence of many unhatched pupal cases of a species of tiny parasitoid wasp, later identified as *Idris saitidis* (Howard)(Hymenoptera; Scelionidae). The adult wasps were observed emerging from their pupal cases later the same evening. Immediately upon emergence, several matings occurred within the spider eggsac. Ten of these individuals were placed in a vial containing a recently produced eggsac of the orbweaver, *Neoscona arabesca* (Walckenaer) (Argiopidae). A second group of six wasps were placed in a vial with an eggsac of funnelweb spider (*Agelenopsis* sp.) (Agelenidae). Oviposition was observed in neither group, and eventually spiderlings emerged from the eggsacs.

- **Geologic Events Affecting Geothermal Conditions in the Cherokee Basin, Southeastern Kansas: Review and Assessment.**

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Several methods are available to determine the maximum burial depth of sediments in basins and geothermal conditions, both past and present. Models can be constructed or past situations reconstructed by interpretative projections, geological intuition, etc. to better understand these past events (geohistory). Basin temperature modeling can be constrained and checked by such methods as reconstructed geohistory, vitrinite reflectance, T-max values, homogenization temperatures (Th) of fluid inclusions and Apatite Fission-Track Analysis (AFTA). For the Cherokee Basin, southeastern Kansas in the U.S. Midcontinent, the maximum depth of burial of Paleozoic rocks is on the order of 6,700 feet (2050 m). Maximum burial occurred by the end of the Permian with regional subsurface paleotemperatures ranging from 75-110°C (167-230°F) and locally, temperatures up to 150°C (302°F). Later, erosion stripped off as much as 2,200 feet (670 m) of material. Circulating fluids active in lower Paleozoic aquifer systems maintain temperature anomalies of from 5 to 7°C (9-13°F) on oil-producing anticlines and were responsible for diagenetic changes in the sedimentary section and the hydrothermal lead and zinc deposits in the Tri-State area. Locally, temperatures may have been increased tens of degrees in the short term by small igneous intrusives in Woodson/Wilson and Riley counties implaced near the end of the Cretaceous. There is no indication that local 'hot spots' in the sedimentary section are the result of higher radioactivity in the Precambrian basement complex.

- **Key to the Unionid Mussels of Kansas.**

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A low-technical key to the extant (in-part) unionid mussels in Kansas based on unique morphological characteristics of the shell is given. Illustrations and a brief review of each species are included.

- **Perch and Habitat Use by Red-Tailed Hawks and American Kestrels Along a Highway in Eastern Kansas.**

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Perch and habitat use of the red-tailed hawk (*Buteo jamaicensis*) and American kestrel (*Falco sparverius*) were compared along Kansas route K254. A 32.2-km stretch of a two-lane highway was observed for two years. The location, time, perch characteristics and habitat were noted for each bird. There were 522 surveys that totaled 16,808 km in which 1711 red-tailed hawk and 494 kestrel observations were recorded. Red-tailed hawks perched in a pasture habitat and used poles and trees more often than American kestrels, which perched in agricultural habitat and used wires most often. When leaves were absent, red-tailed hawks used trees as perches more often than when leaves were present. When leaves were present, red-tailed hawks used agricultural and mixed habitats more often. American kestrels showed little change with presence or absence of leaves.

- **An Assessment of Fish Communities in the Cimarron River in Morton County, Kansas, During Restored Streamflow.**

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In the latter half of 1997 and early part of 1998, the Cimarron River in Morton County, Kansas flowed continuously for nine months. At the request of the United States Forest Service (USFS), Cimarron National Grasslands, quantitative surveys of the fish community were conducted in May and July of

1998 to assess the initial impacts of temporarily restored streamflow on the fish community and the status of USFS Region 2 sensitive species. Ten species of fishes were collected in our study compared to 11 species listed in earlier surveys. Five previously reported species, including three species protected in Kansas, were not collected in our survey. Four nonindigenous species that were not reported in earlier surveys were collected. One new distributional record within Kansas was documented in 1998.

- **Consequences of an Exceptional Ice-Fishing Season on White Bass in Cheney and Glen Elder Reservoirs, Kansas.**

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In Kansas, media attention to ice-fishing has generated a perception among nonice-fishing anglers of excessive harvests that might result in declines in population quality among white bass (*Morone chrysops*) populations in reservoirs. To address these concerns, creel surveys were conducted throughout ice cover at Cheney and Glen Elder reservoirs in 1985, and standard fall gill net samples collected before and after the ice-fishing season were used to measure the effect of ice-fishing on these white bass populations. The 1985 ice-fishing season was exceptional in terms of white bass catch rates and size structure. Ice anglers were selective, harvesting the largest individuals; 58% of creel white bass were ≥ 380 mm. White bass catch-per-unit effort in standard fall gill net samples were significantly greater in 1985, but statistical power was too low to assess differences between many of the length categories. The standard sampling effort of nine net-complement-night sets for Kansas reservoirs larger than 9,000 surface acres is likely inadequate to determine population changes in highly mobile species such as white bass. Recommendations are included to better assess the effects of ice-fishing on white bass populations in Kansas reservoirs.

- **A Highly Automated Laboratory Experiment.**

R. Jones, Physics Department, Emporia State University, Emporia, KS 66801.

Continuing efforts to automate fully a plasma physics laboratory experiment are described. Case-based reasoning software is described which has been trained to operate and improve the performance of a "stellarator type" fusion plasma confinement system. Some original results are reported.

- **Physical and Cultural Influences on the Performance of Septic Systems in Douglas County, Kansas.**

John W. Banning and Curtis J. Sorenson, Dept. Geography, University of Kansas, Lawrence, KS 66047; Richard Ziesenis, Lawrence and Douglas County Health Dept., 336 Missouri, Su. 201, Lawrence, KS 66047.

One-hundred-three household septic systems were examined to determine the frequency of their failure on soils of varying permeability in Douglas County, Kansas during 1998. The data acquired by questionnaire and from public records included statistics on failed systems, ratings for soil permeability, length of lateral lines per septic system, gallons of water used in winter months, and the number of residents per household. A null hypothesis of no difference in failure rates on soils of differing permeability was accepted. However, the results suggested a trend may exist for failure rate according to soil permeability classes (moderate, slow, and very slow) if systems could be monitored more effectively and if sample size were increased. Additional findings suggest that lateral lines installed in soil permeability classes slow and very slow should be at least 1000 feet in length. Also, water usage should be monitored closely and reduced during cold, wet periods when filter field soils are saturated. If homeowners would follow these few simple suggestions and also perform periodic inspection and maintenance on their septic system, failure rates could be reduced dramatically.

- **Distributional Status and Natural History Observations of the Genus *Argyrodes* (Araneae: Theridiidae) in Kansas.**

Hank Guarisco, P.O. Box 3171 , Lawrence, KS.

Four species of *Argyrodes* occur in Kansas: *A. trigonum*, *A. cancellatus*, *A. elevatus*, and *A. pluto*. The first two species occur throughout the eastern United States, whereas the latter two have a more restricted, southern distribution. Members of this genus may occupy the webs of larger spiders, and function as commensals, kleptoparasites, or predators of the host.